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Liaquat Ali Khan
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Allama Iqbal
(1877–1938)
Poet, Philosopher, Politician, Scholar and Visionary of Pakistan Movement. It was Allama Iqbal’s Two Nation Theory that formed the basis of a free and separate homeland for Muslims of the Subcontinent. Known as ‘Shair-e-Masriq’ – Poet of the West. Allama Iqbal was a man of boundless vision and inspired the Muslims of Subcontinent with his eminent words of wisdom.

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The clinicians all over the world are in consensus about the anti-cancer chemotherapeutic drugs used in various malignancies and their side effects on all the organs of the body including eye. It is considered to be a public health problem as documented by WHO. Globally speaking, 1.5% male and 0.6% females get afflicted with various malignancies every year.

Since the visual system has potentially a high degree of sensitivity to toxic substances and the process of visual toxicity induced by anti-cancer therapies may result from accumulation of drug in central nervous system after repeated doses of the drug. Ocular toxicity has been observed with almost after every chemotherapy, if not used according to the prescribed limits. These drugs are used to destroy cancer cells through interfering with the ability of abnormal cells to divide and to multiply itself.

A detailed study has been carried out by a Pakistani researcher Ghazala et al., on the side effects of anti-cancer chemotherapy on visual functions, fundus and ocular adnexa. According to the research, every part of the eye and ocular functions could be adversely affected. In fact, up to certain extent, the side effects on visual functions are reversible after discontinuation or by reducing the regime if noted well in time. Ophthalmic complications are not so common, it could be mild, moderate and severe depending on the kind of drug and its duration of being used. Moreover, it also depends upon the stage of the cancer.

Ocular toxicity includes a wide range of acute or chronic symptoms, disturbing the anatomic and physiological features of the eye like blurred vision, defective color vision, contrast sensitivity, photophobia, visual field defects, retinal changes (pigmentary retinopathy, retinal ischemia, retinal haemorrhages, papillaedema and retinal vein occlusion), uveitis, conjunctivitis and ocular adnexa. In terms of duration, patients taking chemotherapy from 4-5 years have shown significant relation between the duration and appearance of retinopathy. Glare sensitivity is the commonest symptom as compared to other visual functions, which could be reversible or permanent.

Recently, an institutional based descriptive cross sectional study was conducted in the Oncology Deptt. of Mayo Hospital Lahore with College of Ophthalmology and Allied Vision Sciences (COAVS) on 70 patients receiving Chemotherapy from 6 months onward, in the age group of 16 years and above. Researchers found Blurred Vision in 61% of the patients, Glare sensitivity and Defective Contrast sensitivity in 70%, Defective Color vision and Defective visual field in 34% of the patients receiving various chemotherapeutic agents over the period of 6 months and above.

There are variety of chemotherapeutic agents such as anti-metabolites, alkylating agents, Texas and Platinum agents etc which are commonly used in continuation. These are:

- *Flourouracil, Adriyamycin, Cyclophosphamide (FAC),
- *Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone (CHOP),
- *Adriyamycin, Cyclophosphamide (AC),
- *Doxorubicine, Bleomycin, Vinblastine, Dacarbazine (ABVD),
- *Fluorouracil, Leucovorin (FU/LV),
- *Tamoxifen and Toremifene, Interferon.

Tamoxifen and Toremifene (non-steroidal agents with anti-estrogenic properties) are commonly used in breast cancer which produces cataract to the extent of 6.8%. Patients taking Interferon, nitrosoureas - a platinum analogs, and cytosine arabinoside (used in Leukemia) have been observed with retinopathies which include retinal hemorrhage, retinal vein occlusion, cotton wool spots and pigment epithelium detachments but visual function are usually maintained.

Anti-microtubular agents (Vinca alkaloids and Taxanes), are popularly used in haematological malignancies, non-Hodgkin’s lymphoma, breast cancer, ovarian cancer, and Kaposi’s sarcoma. They block cell division by preventing microtubular function, can cause Cystoid Macular Edema. Amongst its derivatives, Retinoic acid are used in hepatocellular carcinoma and leukaemia, while Mitotane is used in...
adrenocortical carcinoma. These can cause night vision problem and papilloedema. High doses of Irofulven treatment which is particularly effective in shrinking tumors associated with pancreatic, ovarian, and prostatic cancer especially in drug-resistant tumors. It interferes with DNA replication and cell division of tumor cells, leading to tumor-specific apoptotic cell death, or “cell suicide”. The drug causes cone damage, abnormality in color vision and contrast sensitivity, detected after 2 weeks’ treatment. Cisplatin and Etoposide also interferes with DNA replication, and kills the fastest proliferating carcinogenic cells, being commonly used in lung cancer treatment. It can cause abnormal cone or rod, ERG responses, transient cortical blindness, papilloedema, and retrobulbar neuritis.

Similarly, a therapy with high dose of Carboplatin an anti-neoplastic drug in the class of alkylating agents which work by disruption of DNA function and cell death, can cause maculopathy, optic neuropathy, chorio-retinitis, photopsias and transient scotomas. Cyclophosphamide mostly causes conjunctivitis eyelid edema, scleral problems, more common with high doses. Glare sensitivity is mostly affected by ABVD therapy and Dacarbazine drugs.

Summarizing, the goal of treatment should be to maximize benefit and minimize toxic effects of chemotherapy. However, it all depends on the type of cancer and type of chemotherapy patients receive. However, patient must be educated and warned by the oncologist before the start of chemotherapy and in case of visual symptoms, must be referred to an ophthalmologist at the earliest possible time. Visual acuity and ocular complications can be treated or prevented, if detected or diagnosed well in time. Therefore a basic ophthalmic examination for patients receiving anti-cancer chemotherapy should be done in order to get early diagnosis regarding any ocular issue. Oncologist and Ophthalmologist should know the serious ophthalmic complications for a particular chemotherapeutic agent. The easiest and best way to prevent irreversible visual functions is to get appropriate and timely ocular health assessment.

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Role of Diffusion Weighted Imaging (DWI) MRI in Diagnosis of Orbital Abscess

Zubair Janan, FCPS\(^1\), Misbah Durrani, FCPS\(^2\), Inam ul Haq Khan, FCPS\(^3\)

**ABSTRACT**

**Objective:** To determine the role of Diffusion weighted Imaging (DWI) MRI in diagnosis of orbital abscess.

**Methodology:** The study was conducted in Radiology Department of Mardan Medical Complex Mardan, from June 2013 to May 2014. This was a cross sectional study. Thirteen patients with infectious orbital cellulitis and suspected abscess were subjected to contrast enhanced MRI of the brain and orbits including whole-brain DWI. Final diagnosis of orbital abscess was based on clinical findings, operative findings and response to antibiotic therapy.

**Results:** Study included 13 patients, DWI showed restriction in 9(69\%) patients. The presence of abscess was determined clinically and surgically in 8 (88.9\%) out of these 9 patients. 1 patient, with no diffusion restriction, showed abscess surgically. Overall sensitivity and specificity for DWI is 88.9\% and 75\% respectively.

**Conclusion:** Diffusion weighted imaging (DWI) of MRI brain aids in the diagnosis of orbital abscess.

**Key Words:** Diffusion weighted imaging (DWI), Magnetic resonance imaging (MRI). Apparent diffusion co-efficient (ADC)

**INTRODUCTION:**

Cellulitis is the inflammation of subcutaneous tissues. Cellulitis in the sensitive area of orbit which can lead to orbital abscess. Orbital abscess is a fatal condition due to its surrounding anatomical structures. Early diagnosis and treatment is very essential to reduce mortality and morbidity. The involvement of cavernous sinus and intracranial extension of disease is serious complication which requires early diagnosis by imaging and then drainage.\(^1\) It is also essential to find the cause of orbital abscess. Frequent association of orbital abscesses is seen with history of sinusitis and trauma.

MRI is a very important diagnostic tool in orbital pathologies. It can identify intracranial extension as well as source of infection in some cases. The safety of intravenous contrast such as Gadolinium is controversial due to nephrogenic complications.\(^2\) Post septal extension of disease can be diagnosed with T2-Fat suppressed sequences which has the same sensitivity as T1-Fat suppressed sequences.\(^3\) The differentiation between abscess and other similar pathologies like edema and phlegmon require intravenous contrast administration.\(^4\) Unenhanced MRI technique without IV contrast may prove beneficial in patients with contrast allergy and renal failure.

Diffusion weighted imaging (DWI) has improved the diagnostic confidence in nearly all cases of orbital abscess when used in conjunction with contrast-enhanced imaging. In addition, DWI confirmed abscess in a majority of cases, without contrast-enhanced imaging (indicating that DWI alone can be diagnostically effective when the use of contrast material is contraindicated). Use of DWI in addition to conventional MRI increases the preoperative sensitivity and accuracy of MRI in diagnosis of orbital abscess.

Diffusion restriction is evident in most cases of abscess formation, the reason being dense arrangement of pus cells.\(^5\) Abscess demonstrates high signal central area on DWI and low signal central area on ADC. This property helps abscess differentiation from tumors with central necrotic component. Such tumors usually have no diffusion restriction of the central component. Previous study on head and neck lesions showed similar characteristics.\(^6\) DWI is very aiding sequence of MRI in diagnosis of variety of orbital pathologies. Diffusion weighted imaging is not used only in diagnosis of orbital abscess. One study has been conducted on the role of diffusion weighted imaging in differentiating orbital cellulitis, pseudo-tumor and orbital inflammatory syndrome.\(^7\) Case report showed the role of DWI in diagnosis of acute optic nerve infarction when compared to other MRI sequences which appeared normal.\(^8\) Optic nerve ischemia is diagnosed on DWI and ADC which is a cause of blindness.\(^9\) Orbital abscess requires emergency therapy. Surgical treatment or...
empirical treatment with antibiotics is the mainstay of treatment. DWI of orbits can be used to monitor the failure and success of therapy for orbital abscess. Re-accumulation of pus can also be assessed. The study is conducted to establish the importance of DWI in the diagnosis of orbital abscess. This will lead to early diagnosis and treatment of the patient. The drastic complications like vision loss and extension into brain will be prevented due to early intervention.

METHODOLOGY:
Patient with orbital cellulitis and suspected orbital abscess were referred by ophthalmologists for MRI to radiology department. Informed written consents were obtained prior to the procedure. Proforma regarding patient’s bio-data and clinical findings was filled. Patients with suspected orbital abscess were included. Those patients with previous history of contrast reactions, metallic implants and suspected non-infectious pathology were excluded. Diagnosis of orbital abscess was based on clinical findings, operative findings, culture, sensitivity and response to antibiotic therapy. Patients who responded to antibiotic therapy without surgical drainage were labeled as cellulitic patients without abscess.

All MRI examinations were performed with a 1.5-Tesla MRI system (Toshiba Excelart Vantage). Patients were prepared for contrast study. All patients underwent routine non contrast MRI brain sequences of T1 Weighted, T2Weighted, fluid attenuated inversion recovery (FLAIR), diffusion weighted imaging (DWI), and apparent diffusion co-efficient (ADC) mapping. Contrast was injected and the post contrast T1W images were acquired. Pre and post contrast axial, sagittal and coronal images were obtained.

The MRI brain images were interpreted by experienced radiologist of the department. Pre contrast images in axial, coronal and sagittal planes were examined for abnormal signal areas in the brain with special focus on orbits. Corresponding DWI and ADC were also correlated. Finally post contrast images were studied for contrast enhancement. After each case it was concluded whether DWI aided in the diagnosis of orbital abscess. Extension of the abscess in brain, if any, was also noted.

Following parameters were determined for validation. Sensitivity = (true positive / true positive + false negative) x 100
Specificity = (true negative / true negative + false positive) x 100
Positive predictive value = (true positive / true positive + false positive) x 100
Negative predictive value = (true negative / true negative + false negative) x 100
Accuracy = (true positives + true negatives / true positives + true negatives + false positive + false negative) x 100

RESULTS:

This study included 13 patients with suspected orbital abscess. 8 (61%) were male and 5 (39%) were female. The age of patients ranged from 7 years to 50 years. Most of these patients presented with decreased vision and orbital swelling. Patients who showed diffusion restriction on DWI and abnormal fluid signal on T2W and T1W images were labelled as a case of orbital abscess. Such cases were 9 out of 13 (69%). Clinical and surgical findings of orbital abscess were positive in 8 of these 9 patients (88.9%). Four patients did not show diffusion restriction on DWI and were considered as negative cases. However out of these 4, 1 patient showed abscess on surgery.

<table>
<thead>
<tr>
<th>Diffusion restriction on DWI</th>
<th>Clinical and surgical presence of abscess</th>
</tr>
</thead>
<tbody>
<tr>
<td>present</td>
<td>true positive (8)</td>
</tr>
<tr>
<td>absent</td>
<td>false negative (1)</td>
</tr>
</tbody>
</table>

Sensitivity = (true positive / true positive + false negative) x 100 = 8/8/9 =88.9 %
Specificity = (true negative / true negative + false positive) x 100 = 3/3 =75 %
Positive predictive value = (true positive / true positive + false positive) x 100 = 8/9/88.9 %
Negative predictive value = (true negative / true negative + false negative) x 100 = 3/4 =75 %
Accuracy = (true positives + true negatives / true positives + true negatives + false positive + false negative) x 100 =11/13 =84.6 %

DISCUSSION:
Diffusion weighted imaging is based on molecular motion of water and thus helps in outlining the microvasculature of tissues. The findings of DWI are usually not diagnosis specific but with other MRI sequences we can establish one and generally the changes are detected early on DWI. called the apparent diffusion. Paired pulses of magnetic field signals are applied. Water molecules with good diffusion show low signal on DWI while areas with restriction show high signal due to non-diffusion of water molecules. Contrast agent is not required in DWI so patients with renal insufficiency and contrast allergies can benefit more.

It is important to highlight that artifacts called magnetic susceptibility artifacts are produced at the interfaces of soft tissue, bone and air during DWI due to local magnetic fields and eddy currents. These artifacts are more pronounced at the orbital apex. Array spatial sensitivity encoded technique (ASSET) parallel acquisition helps in reducing the artifacts and improving image quality at orbit.

The study conducted by Sepahdari ARet al. showed the important role of DWI in diagnosing orbital abscess and its differentiation from orbital cellulitis. It is also evident from their study that correlation with other sequences of MRI and contrast enhanced imaging
Role of Diffusion Weighted Imaging (DWI) MRI in Diagnosis of Orbital Abscess

There are limitations to this study because MRI scanning require long duration of time thus critical patients cannot be subjected to it. Motion artifacts cause limited interpretation of images. Patients with metallic implants like aneurysmal clips and previous cardiac surgeries with metallic prosthesis add to further limitations. Small sample size does not allow a more detailed statistical analysis.

**CONCLUSION:**

In this study, DWI improved diagnostic confidence in nearly all cases of orbital abscess when used in conjunction with contrast-enhanced imaging. In addition, DWI confirmed abscess in a majority of cases, without contrast-enhanced imaging (indicating that DWI alone can be diagnostically effective when the use of contrast material is contraindicated).

Based on the present results we recommend the use of DWI in addition to conventional MRI to increase the preoperative sensitivity and accuracy of MRI in diagnosis of orbital abscess.

**REFERENCES:**

ABSTRACT

Objectives: To determine efficacy of sliding conjunctival flap versus bare sclera + mitomycin-C regarding recurrence of pterygium.

Material and Methods: This study was conducted at Ophthalmology Department Hayatabad Medical Complex, Peshawar. Study design was quasi experimental study. Duration of the study was one year (1st January 2015 to 31st Dec 2015) in which a total of 60 patients (30 in each group) were observed. All the patients were selected through non-probability, convenient sampling technique. Every patient who was diagnosed as having primary pterygium was included in this study. A detailed history and thorough ocular examination was carried out. Type of Pterygium was noted whether it was progressive or regressive. One group underwent Pterygium excision through BST (bare sclera technique) with intraoperative MMC 0.02% application for 2 minutes. In the other group, SCF (sliding conjunctival flap) was carried out. A single surgeon performed surgeries on all the 60 patients.

Results: Pterygium surgery with bare sclera method with mitomycin C resulted in high recurrence rate, 11 out of 30 patients (36.6%) while sliding conjunctival flap had recurrence in 2 patients (6.6%).

Conclusion: Pterygium surgery done by sliding conjunctival flap resulted in low recurrence in 6 months as compared to bare sclera method with mitomycin C.

Key Words: Primary pterygium, Recurrence, Conjunctiva, Sliding conjunctival flap, Bare sclera method, Mitomycin-C, Amniotic membrane transplant.

INTRODUCTION:

Pterygium is a wing shaped subconjunctival and fibro vascular tissue which extends from the conjunctiva to the cornea.¹ It commonly occurs on the nasal side of the cornea but sometimes found on the temporal side of the cornea. On rare occasions, it involves both sides of the cornea. In some instances, it is bilateral in a similar pattern.² On the nasal side (and rarely on temporal side), it has a broad base on epibulbar surface and apex over the cornea.³ Pterygium can be divided into head, neck and body. Cap is a grayish zone preceding the apex or head of the pterygium. The cap is grey white, flat and without blood supply and lies beneath the corneal epithelium and surrounds the head of the pterygium. Stoker’s line is seen in the corneal epithelium adjacent to head of the pterygium and is due to the deposition of the hemosiderin in the Bowman’s membrane. The head of the pterygium is an elevated part and at the head of pterygium has firm adhesion to the globe while body has no strong adhesion to the globe and can be elevated from the epibulbar surface. The body is fleshy and has vascular supply that is separated from the normal conjunctiva both superiorly and inferiorly by sharp folds. Epithelial surface of the body and cornea in the immediate vicinity of the head rarely show punctate staining. Pterygium is also associated with corneal dellen formation.⁴⁻⁵

Sliding conjunctival flap is more effective, associated with less complications than bare sclera technique with MMC.

Pterygium takes several years to reach the visual axis as its growth is very slow. Pterygium can be progressive or regressive depending upon the appearance. Progressive pterygia are seen in younger patients (20 to 30 years old).⁶⁻⁷ Pterygium is also frequently found in conjunctival degeneration in tropical and subtropical areas including Pakistan.⁸ Patients present with complaints of cosmetically visible patch, intermittent inflammation producing photophobia, watering, foreign body sensation and decreased visual acuity due to induced astigmatism, increased glare, decreased contrast sensitivity and involvement of the visual axis by the Pterygium.⁹⁻¹₀ Numerous surgical techniques have been used for Pterygium surgery including Bare sclera method (BSM)¹¹⁻¹³, with or without the use of adjuncts like beta irradiation,¹¹ thiotepa eye drops,¹¹,¹₂ intra or postoperative Mitomycin- C (MMC),¹³,¹⁴ intra operative use of danorubicin,¹⁵ amniotic membrane transplantation and conjunctival autograft (CAG) with or without limbal stem cells¹⁷ sliding conjunctival flap (SCF)¹⁸, keratoplasty and radiotherapy.¹⁹ Recent advance in pterygium surgery is cut and paste technique. Despite all these surgical methods,
Efficacy of Sliding Conjunctival Flap VS Bare Sclera with Mitomycin-C Regarding Recurrence of Pterygium

Pterygium recurrence is a big problem. It may be as high as 83% in BSM and 5-21% in SCF. The difference in recurrence rate in various studies depend on the method used for the study, patients selection, locality of the patients, shape of the Pterygium, definition of recurrence and follow up period. Pterygium recurrence is a challenge for the ophthalmologists, we embarked upon the task to compare the efficacy of primary Pterygium surgery with SCF and BSM with MMC regarding recurrence.

MATERIAL & METHODS:
This study was conducted at Ophthalmology Department Hayatabad Medical Complex, Peshawar. Study design was Quassi experimental study. Duration of the study was one year in which a total of 60 patients (30 in each group) were observed. All the patients were selected through non-probability, convenient sampling technique. Every patient who was diagnosed as having primary pterygium was included in this study. Patients with recurrent pterygium and those who did not give consent were excluded from the study. Patients were either admitted or came as day case surgery. More over all the patients who had primary pterygium between the ages of 15 to 40 years. Both the admitted and day case surgery patients were included while all those patients who were below 15 years of age or above 40 years and those who did not give consent were excluded from the study.

A proforma was designed and completed for all the patients. A detailed history about the visual complaints, pain, redness, irritation, photophobia, watering, foreign body sensation and decrease in visual acuity was taken. Past and present ophthalmic history was also enquired about medications and surgery. History about various systemic diseases such as hypertension, diabetes mellitus and ischemic heart disease was also enquired. Patients were also asked about familial history. Ocular examination was carried out including visual acuity and refraction. Conjunctiva was examined for the vasodilatation, signs of previous surgery, papillary or follicular conjunctivitis and chronic infections. Type of Pterygium was noted whether it was progressive or regressive. Cornea was examined for stigmata of previous surgical scars. The patients were divided into two groups, each composed of 30 patients. One group underwent Pterygium excision through BSM with intraoperative MMC 0.02% application for 2 minutes. In the other group, SCF was carried out.

All the patients were examined on the first postoperative day. Then they were checked after one month and 6th month postoperatively. A proforma was designed and completed for all the patients. Chi square test was applied on the data collected and p-value was calculated.

Local anesthetic 0.5 cc Xylocaine 2% with adrenaline:1:1000 was given beneath and around pterygium. Topical anesthetic (0.5% proparacaine) drops were used 1-2 minutes In BSM, first the head of pterygium was excised from the cornea and rest of the pterygium along with adjacent Tenon capsule was excised off and sclera beneath was left exposed 2-3mm away from the limbus. Then a microsurgical sponge soaked in MMC 0.02% was applied beneath the pterygium for about 2 minutes. The edges of the conjunctiva were sutured together after undermining the adjacent conjunctival tissue.

Operated eye was examined on first postoperative day. After 1 month, patients were examined thoroughly to note the recurrence and other complications. Patients were also examined at sixth months postoperatively. Statistical package for social sciences (SPSS) version 10 was used, for data analysis. Mean and SD was computed for continuous variable like age. Frequency and percentages were calculated for gender and efficacy. Post stratification chi square test was applied in which P value ≤0.05 was considered as significant value.

RESULTS:
The study was conducted on 60 patients divided in two groups, with 30 patients in each group. Gender distribution was analyzed among two groups, in Group A 19(63.3%) patients were male and 11(36.6%) patients were female. While in Group B 22(73.3%) patients were male and 8(26.6%) patients were female. Age distribution was analyzed among two groups, in Group A most of the patients i.e. 12(40%) were in age ranged from 32-40 years, 11(36.6%) patients were in age ranged from 23-31 years and 7(23.3%) patients were in age ranged from 15-22 years. While in Group B most of the patients i.e. 14(46.6%) were in age ranged from 15-22 years, 13(43.3%) patients were in age ranged from 23-31 years and 3(10%) patients were in age ranged from 32-40 years. Mean age in Group A was 30 years with standard deviation SD ± 3.92 while Mean age in Group B was 28 years with standard deviation SD ± 3.25.

Grading of pterygium and recurrence was analyzed among two groups, in Group A most of the patients i.e. 17(28.33%) had Grade II pterygium and recurrence was observed in 6(35.29%) patients, 10(16.64%) had Grade III pterygium and recurrence was observed in 4(40%) patients and 3(36.61%) had Grade IV pterygium and recurrence was observed in one patient. While in Group B most of the patients i.e. 13(21.6%) had Grade II pterygium and recurrence was observed in one patient, 12(20%) had Grade III pterygium and recurrence was observed in one patient and 5(8.33%) had Grade IV pterygium and no recurrence was observed.

Morphological presentation of pterygium and recurrence was analyzed among two groups, in Group A most of the patients i.e. 20(33.3%) had progressive presentation of pterygium and recurrence was observed in 7(35.29%) patients and 10(16.64%) had atrophic presentation of pterygium and recurrence was observed in 4(40%) patients. While in Group B most of the patients i.e. 17(28.33%) had progressive
presentation of pterygium and recurrence was observed in one patient, 13(21.66%) had Atrophic presentation of pterygium and recurrence was observed in one patient. Occupation wise presentation and recurrence was analyzed among two groups, in Group A, 16(26.6%) patients were farmers and had recurrence in 8(50%) patients, 10(16.6%) patients were Laborers and had recurrence in 3(50%) patients, 2(3.3%) patients were Teachers and had no recurrence, 2 (3.3%) patients were housewives and had no recurrence. While in Group B, 14(23.3%) patients were farmers and had recurrence in one patient, 11(18.3%) patients were Laborers and had recurrence in one patient, 3(5%) patients were teachers and had no recurrence, 2 (3.3%) patients were housewives and had no recurrence.

Recurrence of Pterygium in bare sclera technique with MMC and Sliding conjunctival flap was analyzed, in Group A, 11(36.6%) patients had recurrence. While in Group B, 2(6.6%) patients had recurrence. (Table 6)

Complications of bare sclera technique with Mitomycin-C was analyzed among two groups, in Group A, 2(6%) patients had scleral necrosis, 3(10%) patients had conjunctival cyst, 4(13.3%) patients had tenon granuloma, 2 (6%) patients had symblepharon. While in Group B, 2(6%) patients had conjunctival edema, 3(10%) patients had conjunctival retraction, 4(13.3%) patients had sub tenon granuloma.

Recurrence of Pterygium after one month and after six months was analyzed among two groups, in Group A, at first month no recurrence was found in any patient but after 6 months 11(36.6%) patients had recurrence. Similarly in Group B at first month no recurrence was found in any patient but after 6 months 2(6.6%) patients had recurrence. (Table 1,2)

TABLE 1. Recurrence at first month n=30

<table>
<thead>
<tr>
<th>Technique</th>
<th>No. of patients</th>
<th>Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSM with MMC</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>SCF</td>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

Group A = Bare Sclera method with MMC
Group B = Sliding Conjunctival flap (SCF)

TABLE 2. Recurrence at sixth month=n=30

<table>
<thead>
<tr>
<th>Technique</th>
<th>Patients</th>
<th>Recurrence</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSM with MMC</td>
<td>30</td>
<td>11</td>
<td>36.6%</td>
</tr>
<tr>
<td>SCF</td>
<td>30</td>
<td>2</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

Group A = Bare Sclera method with MMC
Group B = Sliding Conjunctival flap (SCF)

DISCUSSION:

Pterygium is one of the most common disorders in tropical and subtropical region including Pakistan. The most important risk factors are exposure to sunlight, hot, windy dry weather and old age. It causes irritation, redness and affects the visual acuity either by directly affecting the visual axis or by producing changes in the corneal curvature.

In our study maximum number of patients were male (63.3% and 73.3%) in both groups as compared to females (36.7% and 26.3 % respectively). Similarly, study conducted by MA Baig et al15 supports our study that pterygium is more common in males. Pterygium was found frequently in those who work outdoors e.g. farmers (50%), and labours (35%). Fatouhi et al have also observed that pterygium is more common in males working outdoors.6 (Fatouhi- Tehran eye study). Similarly study conducted by Sekelj et al also proved that primary and recurrent pterygium are mainly caused by exposure to sunlight.5

In my study, the main indications for pterygium surgery was visual impairment in 58.33% patients. Durkin et al 7 also stated that pterygium was associated with 0.4% of binocular visual impairment and 1.0% of visual impairment in at least one eye. Other indications were cosmesis in 14.93%, recurrent inflammation in 20%, redness and foreign body sensation in 8.33% patients. We performed pterygium excision with two different techniques and compared the results.

The results of bare sclera technique with MMC have been studied by different authors with different recurrence rates. According to Biswas et al 7, recurrence rate after BST with MMC was 10% at the end of one year. Panda et al22 are of the opinion that BST with MMC has better outcome as compared to that without MMC with recurrence rates of 12% at 7 months as compared to 32% at 3–5 months respectively. Cheng et al23 used BST with MMC in 38 primary pterygium cases and found 7.9% recurrence. Gupta et al24 had recurrence rate of 15%. PS Mahar is of the view that intraoperative use of MMC is better than conjunctival autografting with recurrence rate of 9.4% as compared to 25.9%. Nabawi et al19 used BST with MMC in recurrent pterygium and had no recurrence or serious complications. Mahar et al14 had no recurrence in 17 patients who were treated with bare sclera technique with MMC (0.04%). Fotouhi A et al20 used bare sclera technique with MMC in 21 eyes and had recurrence of 5% after a mean follow up of 36 months. Chen et al21 found a recurrence rate of 38%. Lam et al used MMC in different concentrations and for different time of application found that pterygia occurred in 8.3%, 8.6%, 42.9%, and 22.9% patients respectively.39 These variations may be due to occupation of the patients, morphology of pterygium, number of patients studied and difference in the follow up of these studies.

Complications in bare sclera technique with MMC which we observed in our study were scleral necrosis in 6%, conjunctival cyst in 10%, symblepharon in 13.3% and Tenon granuloma in 6% patients. The reason for these complications was abnormal exposure of Tenon tissue without adequate cover by conjunctival tissue or the incarceration of Tenon in the conjunctival wound. Tsai et al40 has reported a case of acute scleral melt with MMC.

Sliding conjunctival flap is cosmetically

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acceptable technique and related to no recurrence or low recurrence rate. This is due to covering of the bare sclera by normal conjunctiva that forms barrier to the proliferation and advancement of residual abnormal tissues towards the limbus. Different recurrence rates have been reported in literature. According to de La Hoz et al. it was 7.7% after 19.7 months. They had 209 patients and their follow up was longer. Muller et al. had a recurrence rate of 6.9% in 29 eyes with an average follow up of 23 months. Fernandez et al had operated upon 32 patients with sliding conjunctival flap and found a recurrence of 16.7%. But this study was a retrospective one and secondly data was analyzed over 14 years. Baig et al. had a recurrence of only 6.25% at the end of 1 year. These variations may be due to different sample size and geographic variations.

Conjunctival button holes occurred intraoperatively in 6% cases in our study. Post-operative complications included, conjunctival edema in 6.0%, conjunctival retraction in 10% and sub Tenon granuloma 13.3% patients.

Sliding conjunctival flap has successful results and is widely accepted in the management of pterygium. However this technique cannot be used in eyes in which conjunctiva is already scarred from previous surgery. In our study the Sliding conjunctival flap technique was found superior to bare sclera technique with MMC as the recurrence rate was statistically low (6.6% vs 36.6% p-value =0.0048). In conclusion, this is a safe technique, has low recurrence and is cosmetically acceptable.

CONCLUSION:
Sliding conjunctival flap is more effective, associated with less complications than bare sclera technique with MMC (p-value=0.0048).

REFERENCES:
To Evaluate the Efficacy of Sub-conjunctival Anesthesia in Manual Small Incision Cataract Surgery (MSICS)

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ABSTRACT:
Objective: To determine the efficacy of subconjunctival anesthesia in manual small incision cataract surgery (MSICS).

Material and Methods: This study was conducted at Ophthalmology Department, Hayatabad Medical Complex, Peshawar. Study design was cross sectional (descriptive) study and sampling technique was non probability consecutive sampling. The duration of the study was nine months (10th May 2014 to 10th February 2015), in which a total of 298 patients were included in the study.

Results: In this study mean age was 61 years with standard deviation ± 3.5. Fifty five (55%) patients were male and 44% patients were female. Efficacy of subconjunctival anesthesia among 298 patients was analyzed and subconjunctival anesthesia was effective in 70.3% patients and was not effective in 29.7% patients.

Conclusion: Sub-conjunctival anesthesia is an effective and safe technique for manual small incision cataract surgery.

Key Words: Efficacy, subconjunctival ophthalmic anesthesia, manual small incision cataract surgery.

INTRODUCTION:
Cataract is a complete or partial opacity of the ocular lens. The exact global prevalence of cataract is unknown, but according to WHO the rate of cataracts is probably much higher in developing countries. Cataract is responsible for 50 to 80% of all blindness in South-East Asia. About 1 in every 100 is blind in Pakistani population of which over 66% is related to cataracts. The cataract blindness is higher in the elderly individuals. The prevalence of cataracts found by Guan et al was 21.35% among adults aged 50 or above and is mostly in female and illiterate persons.

Manual small incision cataract surgery (MSICS), also known as Sutureless Manual Cataract Extraction (SMCE), is a low-cost surgical technique which got popular in developing countries as it allows high-volume surgery without compromising quality of medical care. Several institutions have reported success with MSICS because it avoids sutures related complications and allows satisfactory visual outcome. In MSICS, nucleus is removed through a sclerocorneal tunnel incision. It places less stress on the zonules, does not require expensive equipment like phacoemulsification (PE) and the anterior chamber is quite stable due to the shelving scleral wound.

Several methods of local anesthesia are routinely used in conventional MSICS. Of these, subconjunctival anesthesia has been reported to avoid serious complications associated with other methods of anesthesia. It produces adequate analgesia, but not adequate akinesia. Unlike peribulbar or retrobulbar anesthesia, it also eliminates the risk of globe perforation, retrobulbar hemorrhage, and optic-nerve trauma, and is associated with minimal discomfort. Hussain and associates completed MSICS successfully in almost all cases without any particular side effect under subconjunctival anesthesia and found it completely safe and effective in surgery for cataracts. Kaderli et al reported severe pain at the injection stage in subconjunctival anesthesia. Kongsap et al reported the efficacy of subconjunctival anesthesia 74.7% but the median injection pain score was significantly lower as compare to other anesthesia. Overall, the MSICS successful completion was reported in 96% cases with subconjunctival anesthesia. Kongsap et al and fellow also reported 95% cases successfully undergone cataract surgery under subconjunctival anesthesia but the total efficacy reported was 73.8%.

Sub-conjunctival anesthesia is an effective and safe technique for manual small incision cataract surgery.

Globally, cataract is the leading cause of low vision and blindness all over the world and cataract surgery is the major workload of most eye care units and also a major health care expense. Moreover, just like any other surgical procedure, anesthesia is a prerequisite also for ophthalmic surgical procedures. It may require general anesthesia but most often local anesthesia is adequate in the form of retrobulbar, peribulbar, subtenon, topical and subconjunctival anesthesia. Though cataract surgery is very safe under local anesthesia but still unwanted side effects do occur ranging from bradycardia to orbital inflammation and even death. Selecting the best method is vital both for the surgeon and patient in terms of performing...
surgical procedure safely, comfortably and without any pain. Few studies have been reported in our region of regarding performing cataract surgery with subconjunctival anesthesia. However to our knowledge only one study was completed in Pakistan. So, we need more studies to produce more evidence regarding this method. The current study is formulated to determine the efficacy of subconjunctival anesthesia in manual small incision cataract surgery (MSICS) in our set up. By finding this data, we will be able to evolve a preferred option of local anesthesia based on safety and efficacy. The results will be projected to various health care institutions to improve the cataract surgical management in order to attain better results and minimize the complications related to procedure.

MATERIAL AND METHODS:
This study was conducted after approval from the ethical board and research committee of the institution. Patients from OPD meeting the inclusion criteria were included. The purpose and benefits of study and complete procedure of MSICS with subconjunctival anesthesia was explained to the patients and a written informed consent was obtained. Sample Selection: Inclusion criteria
Patients of both gender with age related lens opacities from age 50 and above. All patients undergoing cataract surgery. (Both indoor and day cases were included).
Patients with no previous ipsilateral ocular surgery e.g. Trabeculectomy, retinal detachment, pars plana vitrectomy etc.
Patients with no history of trauma to eye.
Patients with pupil dilation more than 6mm.

Exclusion criteria
All patients having a history of glaucoma or uveitis or ocular trauma.
Patients with central corneal opacities.
Patients with deep orbits (on surgeon’s decision).
Patients mentally retarded and deaf patients who cannot follow commands.

Before surgery, patients had complete detailed history, ophthalmic examination, investigations necessary for cataract. Preoperative keratometry and biometry was done using the SRK/T formula to calculate the IOL power. Pupil was dilated with cyclopentolate 1% and tropicamide eye drops at 0, 5, 10, 15 and 30 minutes. Two ml of lignocaine (2%) with adrenaline was given in bulbar conjunctiva through injection (sub conjunctival injection) at the site of scleral incision after topical anesthetic eye drops Alcaine (proparacaine). All cases using subconjunctival anesthesia was done by surgeons included in the study who were well experienced with technique of MSICS. Intraoperative complications were recorded.

Efficacy of sub conjunctival anesthesia was measured in terms of patient comfort, surgeon comfort, number of communications needed with patient and intraoperative pain on VAS. Efficacy was measured in terms of intraoperative pain on VAS.

Intraoperative Pain Severity was measured on a visual analogue scale (VAS) of 0-10 given below:

All the above mentioned information including name, age, gender, address, contacts, operative time, postoperative pain on vas and efficacy of subconjunctival anesthesia in MSICS was recorded on a pre-designed proforma. Exclusion criteria was strictly followed to control confounders and bias in the study results.

Statistical Analysis: The data collected was analyzed in SPSS latest version 20. Mean ± SD was calculated for continuous variable like age. Frequencies and percentages were calculated for categorical variable like gender and MSICS with subconjunctival anesthesia. Subconjunctival anesthesia was stratified among the age and MSICS to see the effect modifications. Final results were presented as tables and graphs.

RESULTS
involved in this study, out of which 166 (55.7%) were male and 132 (44.3%) were female. Minimum age was 50 years and maximum was 80 years. Mean age was 61 ± 3.5 years. Age distribution is given in (Table No. I). Age was divided in different groups in which maximum patients lie in age group 61-65 years (40%). Second age group which contains more number of patients was 66-70 years (24.4%). Visual analogue score (VAS) was divided into slight, moderate and intense pain groups. Slight pain group contained highest percentage of patients, which was 70.3% (Table No. II).

According to our operational definition subconjunctival anesthesia during manual small incision cataract surgery (MSICS) was considered efficacious if the patients had VAS of 0-2 (slight pain).

In this study 70.3% of patients had VAS of 0-2 (slight pain) and 29.7% of patients had VAS of 3-10 (moderate-intense pain). Slight pain group contained highest percentage of patients, which was 70.3% (Table No. II).

On stratification of VAS with respect to age, more patients showed VAS ≤ 2 in age group of 61-65 years, but there was no significant difference in age groups in terms of efficacy of subconjunctival anesthesia in MSICS (P = 0.535) (Table No. IV). On stratification of VAS with respect to gender showed significant difference in efficacy of subconjunctival anesthesia among male and female patients (P = 0.014) (Table No. V). This is probably because of increase number of male patients selected in the sample.

TABLE NO I: Age distribution (n=298)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55 years</td>
<td>40</td>
<td>13.42</td>
</tr>
<tr>
<td>56-60 years</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>61-65 years</td>
<td>120</td>
<td>40</td>
</tr>
<tr>
<td>66-70 years</td>
<td>73</td>
<td>24.49</td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>5</td>
<td>1.67</td>
</tr>
<tr>
<td>Total</td>
<td>298</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean age was 61 years with SD ± 3.5

TABLE NO. II: Visual analogue score (VAS)
To Evaluate the Efficacy of Subconjunctival Anesthesia in Manual Small Incision Cataract Surgery (MSICS)

<table>
<thead>
<tr>
<th>VAS</th>
<th>Frequency</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 (slight pain)</td>
<td>209</td>
<td>70.3%</td>
</tr>
<tr>
<td>3-7 (moderate pain)</td>
<td>60</td>
<td>20%</td>
</tr>
<tr>
<td>8-10 (intense pain)</td>
<td>29</td>
<td>9.7%</td>
</tr>
<tr>
<td>Total</td>
<td>298</td>
<td>100%</td>
</tr>
</tbody>
</table>

TABLE NO. III: Efficacy of subconjunctival anesthesia

<table>
<thead>
<tr>
<th>Effect</th>
<th>Frequency</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacious (VAS ≤ 2)</td>
<td>209</td>
<td>70.3%</td>
</tr>
<tr>
<td>Non-efficacious (VAS &gt; 2)</td>
<td>89</td>
<td>29.7%</td>
</tr>
<tr>
<td>Total</td>
<td>298</td>
<td>100%</td>
</tr>
</tbody>
</table>

On application of chi square test P=0.014.

DISCUSSION:

An ideal anesthetic technique must be safe from serious complications, effective in terms of providing good akinesia, analgesia and must not elevate intraocular pressure in order to provide optimal surgical conditions. In the above discussion it is already evident that subconjunctival is safer than peribulbar as a as serious complications are concerned and this study was aimed to know the efficacy of subconjunctival anesthesia in MSICS in terms of analgesia at the time of administration of anesthesia, during surgery.

Ophthalmic surgery is one of the most frequent surgical procedures requiring anesthesia in developed countries. A mere decade or so ago most of the cataract surgeries were used to be performed under local and general anesthesia. As the time passed by, new advances and developments in the cataract surgeries were made. The time of surgery reduced and incision became small and now most of the surgeries are performed under safe and effective means of local anesthesia and hence the unwanted effects that were associated with general anesthesia are no more there with local anesthesia.

There are different techniques of local anesthesia available for cataract surgeries. These are topical and regional. Regional anesthesia includes needle blocks like retrobulbar and peribulbar, subconjunctival and sub-tenon blocks. Topical types are free of serious and life threatening complications, can be used in selected cases however they are lacking akinesia and a possible association between topical anesthesia and endophthalmitis has also been established and also patients undergoing cataract surgery under topical anesthesia experience more postoperative discomfort than patients receiving sub-tenon’s anaesthesia.

Subconjunctival block is pain free and the difference in intraoperative and postoperative discomfort between peribulbar and subconjunctival anesthesia was not statistically significant, and there were no complications resulting from needle insertion. Needle blocks like peribulbar and retrobulbar anesthesia provides excellent analgesia and akinesia however they are trickier and serious and life threatening complications can occur with these procedures. Therefore these techniques require intravenous lines and presence of anesthetist and can be performed under the supervision of senior and experienced ophthalmic surgeon as suggested by joint report of royal college of anesthesia and royal college of ophthalmologists.

Subconjunctival anesthesia provided a safe, effective, and minimally invasive technique and most patients who had SCA (90%) reported no pain during surgery. In another study there was no significant difference in the sensory anesthesia, analgesia and intraocular pressure
changes in the two groups; topical and subconjunctival anesthesia in cataract surgery. (p > 0.05).\textsuperscript{19}

In our study patients in which anesthesia were not effective is moderate and intense group in visual analogue score range from 3-10 was total of 29.7%. Stratification of efficacy of subconjunctival anesthesia among age proved to be having little difference in different age groups which wasn’t statistically significant. However efficacy of anesthesia among gender shows that anesthesia was more effective in male gender but this may be because more number of male patients was included in my study.

Subconjunctival anesthesia has been found to be more comfortable for the patient, as compared to peribulbar for MSICS. It is also less time consuming. A study by Peterson shows that subconjunctival anesthesia is a method of anesthesia for intraocular surgery of the anterior segment of the eye that avoids the risks of the potential complications associated with retrobulbar and peribulbar anesthesia. The method consists of topical anesthesia plus 0.5 cc of lidocaine (with hyaluronidase and epinephrine) injected beneath the superior conjunctiva. They have demonstrated the safety and effectiveness of this technique in 431 consecutive cases.\textsuperscript{11}

Subtenon anesthesia was more comfortable for the patient at the time of anesthetic administration. They also had good analgesia intraoperatively, but the surgeon had to operate with incomplete akinesia, which some may find discomforting. The surgery was started immediately after administration of anesthesia. As lesser amount of the anesthetic agent was used for subconjunctival anesthesia, the chances of adverse effects are also minimized. In a large hospital or in a community eye care setting, the cost would also be less.

CONCLUSION:
Sub-conjunctival anesthesia is an effective and safe technique for manual small incision cataract surgery.

REFERENCES:
Axial Length of Eye in Newborns with Possible Prediction of Amblyopia

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ABSTRACT

Purpose: The purpose of study was to find out mean axial length of eye in newborn babies in Pakistani population and possible difference of axial length in right and left eye to predict amblyopia.

Methods: The study was carried out in a tertiary care teaching hospital. Axial length of 200 eyes of 100 new born babies was determined by using B scan. One hundred newborns were classified according to their gestational age into preterm and term infants and their axial length was measured with B scan.

Results: In the present study, male to female ratio was 55:45. In the study 84% of the newborns were full term babies and 16% were preterm. Average axial length of 100 right eyes was 14.93mm while average axial length of left 100 eyes was 15.25mm. This does not look much different but when looked for those eyes that have 1mm or more than 1mm difference in two eyes then it was found out that 40 out of 100 eyes had 1mm or more than 1mm axial length difference. This is significant as more than 1mm difference between two eyes can have approximately 3 diopter difference which can cause amblyopia.

Conclusions: Axial length measurement at birth can possibly predict amblyopia though larger studies. needed to confirm this finding in different ethnic groups, consanguineous marriages or diverse communities with different cultures.

Key words: New born, axial length, B scan, amblyopia

INTRODUCTION

Axial length has been the focus of attention for many years because of its direct relationship with refractive errors. Refractive status at birth is related to the gestational age. Pre-term babies are myopic and myopia decreases with increasing gestational age. Full term babies are known to be hypermetropic. The axial length of the eye is approximately 16.2 mm at birth. From the time of birth uptil the six years of age, the eye ball grows approximately by 5mm and loses 4 dioptries of its corneal power and 20 dioptries of the lens power. It has been widely accepted that refractive error is generally the result of the anomalies in the axial length growth. The hypermetropic eye is a short eye and the myopic eye is a long eye.

Methods to measure axial length include radiography, ultrasonography and computerized tomography. The first application of diagnostic ultrasound in ophthalmology was reported by Mundt & Hughes in 1956 and later by others including Adhayo et al 2007. However B-scan examination of the eye was introduced by Baum and Greenwood. The most popular way of measuring axial length measurements in children is B-scan ultrasound, which is also most reliable form of axial length measurement in this age group. However in adults and cooperative children A-scan ultrasonography is utilized for axial length measurements.

The presence or absence of refractive errors in the human eye is based on the axial length of the eye ball. It has now been established that the normal development of vision takes place in the first five years of life and more particularly in the first three years of life. Identifying easily measurable parameters in babies can help us in the prevention of refractive error and eventually blindness in such babies because of amblyopia.

The purpose of the present study is to find out average axial length in our population and to compare it with axial length of other populations. In this study we also tried to find out any difference of axial lengths in right and left eye which may help to predict refractive errors in newborns which in turn can help to predict amblyopia.

Axial length measurement at birth can possibly predict amblyopia though larger studies, needed to confirm this finding in different ethnic groups, consanguineous marriages or diverse communities with different cultures.

MATERIAL AND METHODS:

The present study was carried out at tertiary teaching Hospital, Peshawar. Hundred newborns admitted to the nursery ward of hospital were included in the study. The study was carried out over 12 months. This cross sectional (descriptive) study was carried out using B-scan ultrasonography for determination
of axial length of the eye ball. Newborn babies were examined and classified according to their gestational age into preterm and full term babies. Neonates with parental history of high myopia in parents, underlying metabolic and genetic disease and ocular anomalies such as, anophthalmos, retinoblastoma, congenital glaucoma and persistent hyperplastic primary vitreous were excluded from study.

Axial length (AL) in children is commonly measured using with contact or immersion technique. The measurement of the axial length is very difficult in young, uncooperative children and in infants sometimes it has to be done under general anesthesia. Contact A-scan measurement gives a shorter axial length, on average, than immersion A-scan measurement in pediatric eye. It is due to the depth of the anterior chamber rather than lens thickness. The B-scan is the more accurate technique for the measurement of the axial length in newborns and small children.

The axial length of the eye was measured in millimeters by the help of the B-scan ultrasonography. It was performed on all the neonates fulfilling the inclusion criteria. Ultrasound examination of the neonate was carried out in the supine position. The probe was applied to the closed eyelids after generous application of the coupling gel. The eye ball was scanned along the axial length of the eye ball. The axial length of the eye ball is the distance between the anterior and posterior poles of the eye ball.

RESULTS:

term and pre-term distribution of 100 newborns was analyzed as full term n=84(84%), and preterm were n=16(16%). Gestational age of 100 newborns was analyzed as most of the newborns n=79(79%) had POG ranging from 38-49 weeks, n=20(20%) newborns had POG ranging from 35-37 weeks while only one newborn had POG 41 weeks. Mean Gestational age was 38 weeks with a standard deviation ± 1.46. Gender distribution of 100 newborns was analyzed as n=55(55%) male and female is n-45 (45%).

Average axial length of 100 right eyes was 14.93mm while average AL of left 100 eyes was 15.25mm. This does not look much different but when looked for those eyes that have 1mm or more than 1mm difference in two eyes then it was found out that 40 out of 100 eyes had 1mm or more than 1mm axial length difference. This is significant as more than 1mm difference between 2 eyes can have approximately 3 diopters of difference in refraction which can cause amblyopia.

In 14 of our patients right eye was 1mm or longer than left eye. Subset of these 14 eyes had average right AL of 16.53mm as compared to average AL of 14.95mm of left eye. In this subset right eye was 1.58mm loner. In 26 of our patients left eye was 1mm or longer than right eye. Subset of these 26 eyes had average left AL of 16.61mm as compared to average AL of 15.04mm of right eye. In this subset left eye was 1.57mm longer. As a whole, 40% of newborns had right or left eye 1.57mm (average of 1.57 & 1.58) longer than other eye.

DISCUSSION

This study is new of its kind in this region. The study of refraction in newborn babies is helpful to understand the incidence of refractive errors as most of the studies have been performed on young children and adults.

In the present study a total of hundred newborns were included, 55% of the babies were male and 45% were female. 84% of the births were term and 16% were pre-term. All newborns were physically examined and a detailed history was obtained from the mother to exclude any systemic and genetic disorder. These conditions have already been mentioned in the exclusion criteria. A detailed ophthalmological examination was carried out to exclude any ocular abnormalities. B-scan ultrasound was performed after applying a coupling gel to the closed eyelids of the newborn. The axial length of each eye was measured separately and the mean axial length was calculated after taking five readings for each eye.

The refractive power of the cornea and the refractive power of the crystalline lens and the axial length of the eye ball, all of them contribute to the overall refractive power of eye. The axial length of the eye ball has got a direct relation with the refractive status of the eye, a shorter axial length causes hypermetropia and a longer axial length causes myopia. From theoretical calculations, any increase in the axial length of the eye by 1mm increases the refractive error by approximately 2.7 diopters. Donald et al studied the axial growth and changes of corneal power during the process of emmetropisation in infants to evaluate the contribution of the ocular component such as, axial growth, corneal power and lens power they concluded that the axial growth is the most important factor in refractive errors which is also consistent with the findings of the present study.

The prevalence of amblyopia is underestimated and amblyopia is one of the commonest risk factors for visual impairment in children. This high prevalence is because of lack of awareness and failure in early diagnosis. If we can predict amblyopia in a newborn then parents can be on high alert to have eye examination of such children to avoid amblyopia. We can save vision of children if we can predict amblyopia with ultrasound. We think that after finding difference in axial length, we need to follow them up to observe how many of them actually are likely to develop amblyopia.

In our study 26 left eyes were smaller than left eyes which could mean that they may be hypermetropic and thus at risk of developing amblyopia. Amblyopia was most commonly seen in younger males in the first
two decades of life. The predominant prevalence of amblyopia in the left eye may be attributable to ocular dominance, microtropia, laterality in the development of refractive error, developmental or neurological factor or a combination of the above mentioned factors.

We suggest that anisometropic amblyopia is a treatable condition in most cases. Early diagnosis of anisometropic amblyopia should be part of routine eye examination of a child. In developed countries all children are screened at age of 4 year for visual acuity examination and same should be done in Pakistan. In addition to such examination, ultrasonoscopy of eyes can show us difference in axial lengths of two eyes. We can put parents and doctors on high alert to look for amblyopia at early age where it can be treated with ease.

CONCLUSION AND SUGGESTIONS
Axial length measurement at birth can possibly predict amblyopia though larger studies, needed to confirm this finding in different ethnic groups, consanguineous marriages or diverse communities with different cultures.

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Contradiction in Using Steroids in IOP Responders, if Carefully Identified Before & After Surgery

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Department of Ophthalmology, Dow University of Health Sciences, Karachi

ABSTRACT:
Objective: To determine steroid responders following the use of steroid drops after cataract surgery.
Study Design: Descriptive, cross-sectional study.
Place and Duration of Study: Department of Ophthalmology, Unit II, Dow University of Health Sciences and Civil Hospital, Karachi, from August 2015 to May 2016.
Methodology: After informed consent, all patients had complete eye examination including measurement of intraocular pressure (IOP). They were all advised prednisolone acetate eye drops, initially 2-hourly for 4 days and then 6-hourly for 6 weeks. IOP was measured by airpuff (non-contact) tonometer on first post-operative day and the subsequent readings were taken with applanation tonometer. Follow-up was done at first postoperative day; then at 1 week, 2 weeks and 3 weeks. Elevated IOP was considered to be more than 21 mmHg.

Results: There were 255 patients in the study. Minimum IOP during study was 6 mmHg and maximum 22 mmHg. The median and interquartile range of IOP before and after surgery were 12 (4) P value was 0.198.

Conclusion: Our study showed steroids can be used safely provided IOP is monitored carefully. If steroid responders are identified in time, any side effects can be prevented.

Key Words: Steroids, intraocular pressure, cataract.

INTRODUCTION:
Despite many innovations, the use of topical corticosteroids following eye surgery has not declined over the years. Steroids are used as they reduce inflammation and adhesion formation and therefore promote quick improvement of vision. Steroids also help reduce complications associated with inflammation such as corneal edema and cystoid macular degeneration. However, the use of steroids is not without its hazards such as vulnerability to infections and impaired recovery of wound architecture. Use of steroids in some patients is also associated with increase in intraocular pressure (IOP). This increase in IOP associated with the use of steroids was first reported by Armaly and Becker in 1960.³,⁴

The patients in whom use of topical steroids is associated with rise in IOP are known as “steroid responders.” They are said to constitute 18-36% of patients.⁵ The rise in IOP has a genetic basis.⁶ A certain protein on the GLCIA and MYOC sites on the chromosomes have been identified in steroid responders. Usually, it takes around 2 to 6 weeks of topical steroid instillation to cause raised IOP.⁷
to identify steroid responders, careful IOP measurements are to be carried out before and after surgery. There is no reason that steroids shouldn’t be given, if identified in good time the side effects can be thwarted by timely intervention.

This increased IOP varies according to the type of steroid preparation being used and how often it is instilled. The mechanism of elevation of IOPs said to be due to changes induced by corticosteroids in the trabecular meshwork.⁸ Although in many cases this elevation of pressure is transient and the pressure will return to normal on stopping topical steroids, within 1 to 3 weeks of discontinuation of treatment.⁹ For some, however, intervention such as pressure lowering medication or surgery may be needed.¹⁰

Those that are more likely to have increased IOP in response to steroids are high myopes, diabetics, patients with preexisting glaucoma and children.¹¹ Also predisposed are patients with long axial length.¹² As there is a genetic basis for this increase in IOP with steroids and as this phenomenon is more common in certain groups than others, such as those with a
family history of glaucoma, it is necessary to see what proportion of patients in our population are so called “steroid responders”. The objective of this study was to determine the frequency of elevation in IOP with topical corticosteroids in our population and the factors associated with it.

**METHODOLOGY:**

This prospective, quasi-interventional study was conducted in the Department of Ophthalmology, Unit II, Dow University of Health Sciences and Civil Hospital, Karachi over a period of 10 months between August 2015 and May 2016. All patients who underwent cataract surgery during this period and were treated with topical steroids were part of this study. After informed consent, all patients had complete eye examination including measurement of IOP by applanation tonometer. They were all advised prednisolone acetate topical eye drops initially 2 hourly for 4 days and then 6 hourly for 6 weeks. IOP was measured again by air-puff (non-contact) tonometer on the first post-operative day. Subsequent IOP measurements were done by applanation tonometer. Follow-up was done at first postoperative day, at 1 week, 2 weeks and 4 weeks. IOP more than 21 mmHg was considered to be elevated.

**Statistical analysis:** Data were entered in MS Excel and analyzed in IBM SPSS version 21. Descriptive statistics were presented in form of median, interquartile range, minimum and maximum values of preoperative and postoperative IOP. Prior to compare IOPs values pre and post operation, normality test was executed by Shapiro-Wilk test. Since the test indicated non-normal distribution of data values of IOPs, therefore Wilcoxon’s signed rank test was performed to observe difference in IOPs values before and after the application of steroid.

**RESULTS:**

The minimum IOP value which was observed before the operation was 6 while maximum was 22. The increased in respective minimum and maximum IOP values after the operation was 7 and 27 (Table 1). The median and interquartile range of IOP before and after surgery were 12 (4). Though, this change was found statistically insignificant (P = 0.198).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median (IQR)</th>
<th>Min-Max</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preop</td>
<td>12 (4)</td>
<td>6-22</td>
<td>0.198†</td>
</tr>
<tr>
<td>Postop</td>
<td>12 (4)</td>
<td>7-27</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION:**

There are various indications for use of steroids in ophthalmology such as uveitis, dry eye, allergic conditions, macular edema and after eye surgery, etc. Raised IOP in steroid responders with topical drugs usually occurs after 4 to 6 weeks of treatment. A rise of up to 5 mmHg is seen in 20% people and 15 mmHg rise in up to 5% individuals.

In our study, two steroid responders were identified. Topical steroids were put on hold and topical anti-glaucoma medication was given for two weeks till the pressure normalized. One patient was identified as being that of primary open angle glaucoma; she also had a positive family history. This patient was kept on regular anti-glaucoma medicines. Considerable increase in IOP was seen with the use of topical steroids in one study and one steroid responder was identified. In this study, use of topical steroids was compared with the use of non steroidal anti-inflammatory drugs (NSAIDS). Patients using topical steroids had higher IOPs compared to those on NSAIDS, the difference being 0.5 mmHg. In another study, it was reported that between 5 to 33% of the general population are steroid responders. If steroid responders are identified, the use of steroids should be limited to two weeks. Medicines that decrease aqueous flow such as beta blockers, topical carbonic anhydrase inhibitors and alpha agonists are helpful in such patients.

The more potent the steroid the more likely is there increase in IOP. Topical steroids in order of potency are Flurometholone, Dexamethasone sodium phosphate, Loteprednol, Prednisolone acetate and Difluprednate emulsion. However randomized controlled studies comparing the efficacy of different topical corticosteroids found significant difference in the likelihood of causing clinically significant elevation of intraocular pressure. Dexamethasone, prednisolone and difluprednate are more likely to cause this elevation than flurometholone, rimexolone and loteprednol. When patients with glaucoma are operated for cataract there can be more rise in IOP postoperatively then in normal eyes and this raised IOP maybe for a longer duration also. Therefore topical anti-glaucoma medicines have to be included in their treatment and continued till the IOP lowers.

In a study, comparison of efficacy and adverse affects of prednisolone acetate 0.5%, ketorolac tromethamine 0.5% and fluorometholone acetate 0.1% was made in patients with post operative inflammation following cataract surgery. It was found that mean intraocular pressure was higher in prednisolone group compared to ketorolacbut did not differ from fluorometholone group.

The anti-glaucoma medicines in turn have their side effects, one being cystoid macular edema due to prostaglandins. Patients with Fuch’s heterochromic iridocyclitis are another challenging scenario for cataract surgery. The postoperative rise is managed with medication alone but in 70% patients there is
5.	Dr. Attaullah Khan as Associate Professor of General Surgery.
3. Dr. Jan Muhammad & Dr. Sabir Khan, both as Associated Professors of Paediatrics.
2. Dr. Qamar Ali as Professor of Paediatrics.
Khan & Dr. Tajammal Khan, both as Associate Professors, Ophthalmology.
1. Dr. Saadia Sethi has been promoted as Professor of Ophthalmology while Dr. Bakhat Smar
had to be restarted. 12
Dr. Chang DF, Tan JJ, Tripodis Y. Risk factors for steroid response

Another option is the low potency steroids
which cause less side effects. They can be used for
longer time intervals. 15
Steroids are used for approximately one month
after cataract surgery. In patients with compliance issues
subconjunctival injections of methyl prednisolone can
be used. 13 Phacoemulsification itself has a pressure
lowering effect in patients with glaucoma that undergo
cataract surgery. This effect is maintained for around a
year after surgery after which anti-glaucoma medicines
had to be restarted. 12

CONCLUSION:
Our study was conducted to identify steroid
responders. If careful IOP measurements are done
before and after surgery there is no reason that steroids
shouldn’t be given. Steroid responders if identified in
good time the side effects can be thwarted by timely
intervention.

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Contradiction in Using Steroids in IOP Responders, if Carefully Identified Before & After Surgery

8 consultants in Khyber Teaching Hospital, Peshawar promoted
Following faculty members serving at Khyber Medical College & Teaching Hospital
have been promoted.

1. Dr. Saadia Sethi has been promoted as Professor of Ophthalmology while Dr. Bakhat Smar
Khan & Dr. Tajammal Khan, both as Associate Professors, Ophthalmology.
2. Dr. Qamar Ali as Professor of Paediatrics.
3. Dr. Jan Muhammad & Dr. Sabir Khan, both as Associated Professors of Paediatrics.
4. Dr. Abida Nasreen as Associate Professor of Gynae & Obstet.
5. Dr. Atta ullah Khan as Associate Professor of General Surgery.
INTRODUCTION:

Macular holes, first classified by Gass and Johnson, who described stages of idiopathic holes and precursor lesions, may be repaired with pars plana vitrectomy (PPV), membrane peeling, and gas-fluid exchange, which can achieve anatomic and visual improvement. The internal limiting membrane (ILM) forms the innermost layer of the retina and the outer boundary of the vitreous. It contains collagen fibrils, proteoglycans, basement membrane and the plasma membrane of Müller cells, and possibly other glial cells of the retina. Histologically, ILM around macular holes also contains myofibrocytes, and contraction of these myofibrocytes has been suggested to cause enlargement of the macular hole and prevent its closure. Therefore, the removal of the ILM may be a surgical adjunct that can promote gliosis and the closure of macular hole. However, the visualization of the thin and transparent ILM intraoperative is often difficult and may preclude its complete removal without damaging other parts of the retina. Excessive unsuccessful attempts to remove the ILM during macular whole surgery may decrease the visual success. Indocyanine green (ICG) dye has been used to stain the ILM and facilitate its removal. In our previous study, we demonstrated that removal of ICG stained ILM around idiopathic macular hole was confirmed with histology and might contribute to macular hole closure.

Chronic stage 3 macular hole can be closed successfully in majority of patients with fairly good visual improvement. These holes may not have any correlation with the anatomical and visual outcome.

Surgical peeling of the ILM, especially the initial grasping of the ILM, visualization of the border between peeled and unpeeled ILM, and determining the extent of the ILM peel can be technically challenging, even for experienced vitreoretinal surgeons, in large part because of the difficulty visualizing this diaphanous structure. During the past 2 years, several publications have reported the adjunct of indocyanine green (ICG) dye for ILM peeling in macular hole surgery. However, a recent report by Sippy and associates has shown the potential damage to retinal pigment epithelial cells induced by direct contact with ICG. Indocyanine green contains iodine to enhance its solubility and must be dissolved in pure H2O. In our study, we used infracyanine green to stain the ILM.
Infracyanine green does not contain iodine, precipitates in H₂O, and glucose 5% is rather used as a solvent. Whereas the ICG dye is dissolved in 5 ml pure water for injection and then 1 ml of this solution is diluted in 4 ml BSS plus, a hypo-osmotic solution is obtained. The observed toxicity of ICG on retinal pigment epithelium cells is probably related to the hypo-osmolarity of the solvent and may be avoided by using infracyanine green dissolved in glucose 5%.

The purpose of this study is to compare the anatomical outcome of chronic idiopathic macular hole with ILM peeling in 50 Cases.

**METHODS:**

Chronic macular hole was defined as duration of complain more than 1 year. Stage 3 macular hole was defined as minimum linear diameter (MLD) more than 400 µm without posterior vitreous detachment from optic disc and macula. MH size was measured with time domain optical coherence tomography (Zeiss stratus OCT). All patients had undergone 3 port 23 gauge pars plana vitrectomy (PPV) with internal limiting membrane (ILM) peeling and perfluoropropane (C3F8) gas tamponade.

All patients had been advised face-down positioning in the post-operative period for 10 days. Patients with corneal opacity, coexisting history of diabetes mellitus, venous occlusive disease and traumatic macular hole were excluded. Age and gender of the patients were recorded. Preoperative best distance corrected visual acuity (BCVA), preoperative macular hole size, final BCVA and macular hole status at 1 year follow up were recorded. Macular hole was considered closed if there was no foveal neurosensory retinal defect, confirmed by OCT. Gain of two or more lines of Snellen’s visual acuity was considered as visual improvement. Any complications in the postoperative period like retinal detachment, cystoid macular edema and late reopening of macular hole were recorded.

Retrospective interventional case series was conducted in the Civil Hospital Karachi. Records of all patients with stage 3 chronic macular holes operated from 1st January 2016 to 30th June 2016 and completed 1 year of follow up were included in the study. The study adheres to tenets of Declaration of Helsinki and informed consent was obtained from all the patients prior to surgery. Statistical analysis: Data were entered in an excel spreadsheet (Microsoft Corp.) and analyzed using SPSS software (version 16.1, SPSS, Inc.). Continuous variables were expressed as the Mean ± Standard deviation (SD) and categorical variables were expressed as individual counts. The Snellen’s visual acuity was converted into logarithm of the minimum angle of resolution (logMAR) units for analysis. Differences were considered statistically significant when the p value was less than 0.05. Correlation of macular hole closure and visual improvement with various macular hole parameters (minimum linear diameter, base diameter and hole height) was estimated using spearman’s rank test.

**RESULTS:**

Eleven (73.3%) macular holes closed at 1 year follow-up. Mean preoperative and 1 year postoperative logMAR BCVA was 1.2 ± 0.27 and 0.89 ± 0.36 respectively (Figure 1). There was a significant improvement in BCVA at 1 year (p<0.001). Visual improvement was seen in only 8 (53%) eyes. None of the eyes showed a decrease in visual acuity. Both macular hole closure and visual improvement showed no correlation with MLD, base diameter and hole height (Table 1). None of the patients showed complications like retinal detachment, cystoids macular edema and late reopening of macular hole. Fifteen patients were included in the study. Mean age of the patients was 65.3 ± 9.0 years (range= 50-89 years) and male: female ratio was 7:8. Seven left eyes and 8 right eyes were operated. Mean macular hole size parameters of the patients is given in Table 1:

<p>| Table 1: Macular hole parameters and its correlation with hole closure and visual improvement |
|-----------------------------------------------|------------------|-------------------|-------------------|</p>
<table>
<thead>
<tr>
<th>MH parameters</th>
<th>Mean(SD) (µm)</th>
<th>Macular hole closure</th>
<th>Visual improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLD</td>
<td>667 (134)</td>
<td>0.139 0.62</td>
<td>0.12 0.66</td>
</tr>
<tr>
<td>Base diameter</td>
<td>1126 (350)</td>
<td>-0.371 0.17</td>
<td>0.24 0.38</td>
</tr>
<tr>
<td>Hole height</td>
<td>698 (113)</td>
<td>-0.310 0.26</td>
<td>0.35 0.2</td>
</tr>
</tbody>
</table>

**DISCUSSION:**

Visual improvement was seen in only 53% eyes in our study. Various authors have reported variable functional outcome for various stages of macular hole. In a study by Tape and colleagues, this value was reported to be 45% of eyes had an improvement in visual acuity in studies by Shukla et al., and Scottetal respectively. Kang HK and associates reported visual improvement in 62.5% of stage2 and 50% stage
3 or 4 holes which was similar to that in our study.\textsuperscript{10} Several macular hole parameters have been studied for their value in predicting anatomical and visual outcomes. Base diameter, macular hole inner opening and minimum linear diameter has been found to be predictor of anatomical and functional success in macular hole surgery; base diameter holding the strongest association.\textsuperscript{20-21} However, both macular hole closure and visual improvement showed no correlation with minimum linear diameter, base diameter and hole height in our study. This may be due to the fact that only stage 3 MH were included in our study and thus hole size larger than 400 µm did not show correlation with anatomical and functional success. The management of macular hole has evolved from an untreatable condition to a microsurgical procedure with a good success rate. During this course, there have been several modifications in the surgical technique and adjunctive treatments.\textsuperscript{3}

In various studies, macular hole closure rate ranged from 56% to 100%,\textsuperscript{7,10-12} In this study the hole closure rate was only 73.3% which was similar to that reported by Thapa et al.\textsuperscript{14} Similarly Shukla and colleagues reported a hole closure rate of 81% for chronic macular holes.\textsuperscript{11} As only stage 3 macular holes were included in our study, MLD ranged from 436 to 910 µm. Ip and associates obtained an anatomical closure rate of 56% when the MH was larger than 400 µm, whereas this percentage increased to 92% for MH smaller than 400 µm.\textsuperscript{10} For holes > 400 µm, success rate has been found to be significantly higher with face-down posturing than sitting posture after surgery (95.1% versus 79.5%).\textsuperscript{15} The low rates of hole closure in our study may be attributed to poor compliance with post-operative head posturing or large hole size.

CONCLUSION:

Chronic stage 3 macular hole can be closed successfully in majority of patients with fairly good visual improvement. Macular hole parameter of stage 3 holes may not have any correlation with the anatomical and visual outcome.

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INTRODUCTION

Dissociated vertical deviation (DVD) is intermittent upward deviation with exycyclotorsion and lateral deviation. The reported prevalence of inferior oblique overaction (IOOA) and DVD ranges from 76% to 88% in infantile esotropia and 50% in infantile exotropia. It may remain latent (compensated) or manifest (decompensated). The deviation may be symmetrical or asymmetrical, and small or very large, measuring more than 20 (prism diptors). DVD may occur alone or in combination with a true hyperdeviation. When fixation is regained, the up-drifted eye will return slowly to the primary position without any accompanying re-corrective movement in the contralateral eye, so the term dissociated arise. This type of strabismus is often variable, making measurement and clinical quantification difficult.

Inferior oblique overaction (IOOA) is the commonest cause of (upward deviation) hypertropia in adducted position of the eyeball. IOOA may be congenital or result from superior oblique palsy. Typically, DVD appears in preschool-age and school-age children who have had horizontal muscle surgery earlier in life to correct horizontal strabismus. Currently, recommended indications for surgery include increasing frequency of manifest large DVD, associated anomalous head posture, and significant IOOA. It can be managed by different surgical procedures performed on inferior oblique e.g. recession, disinsertion, myectomy and anterior transposition.

Dissociated Vertical Deviation (Dvd) & Hypertropia from Inferior Oblique Over-action Can Be Treated Successfully And The Surgery Results Are Satisfactory.

MATERIALS AND METHODS

Operations performed by KKS for hypertropia due to inferior oblique over action and DVD from 1st Jan 2016 to 30 Dec 2016 in Mughal Eye Hospital Lahore were analyzed to find out the affectivity of muscle surgery. Preoperative assessment included recording of vision, cycloplegic refraction and measurement of angle of squint by Hirschberg/prism cover test using a prism bar. IO Action was assessed and graded on a scale of -4 to +4.

Results: 8 cases of DVD were operated. Average preop angle was 30 (Prism Diptors) (Range 25 - 50). Average post op angle was 5 prism diptors (Range 3 - 10). Inferior Oblique Myectomy was done in 9 cases. Average preop Inferior Oblique Overaction (IOOA) was +3 (Range 2 - 4). Post op IOOA was less than +1 in all the cases. Average preop hypertropia Angle was 25 prism diptors (Range 15 - 55). Average post op angle was 7 prism diptors (Range 4 - 12). In one case of 30 Hypertropia, Inferior Oblique Myectomy combined with contralateral inferior rectus recession corrected the hypertropia.

Conclusion: DVD and Hypertropia due to Inferior Oblique overaction can be treated successfully and the surgery results are satisfactory.

Keywords: Vertical squints, Hypertropia, Dissociated vertical deviation (Dvd)
both eyes or those having IOOA. Inclusion decision was not affected by concurrent or previously done horizontal muscle surgery. Patients who underwent previous oblique or vertical rectus muscle surgery were excluded. DVD patients associated with paralytic or craniofacial anomalies were also excluded. High level of cooperation was needed for optimum pre- and post-operative measurements, so uncooperative patients were also excluded. Pre-operative and post-operative measurements were undertaken by one assistant who was masked to the procedure that was performed. IO action was assessed and graded on a scale of –4 to +4. DVD in primary position was measured by alternate base-down prism cover test while patient fixing a 6m distant accommodative target and wearing his/her refractive correction. Preop and post op photograph/video clips were taken. Cases were followed up for minimum of 3 months (average 5 months range 3 to 8 months).

RESULTS

8 cases of DVD were operated. Average preop angle was 30 (prism diopiers) (range 25 - 50). Average post op angle was 5 prism diopiers (range 3-10). Inferior oblique myectomy was done in 9 cases. Average pre op inferior oblique overaction (IOOA) was +3 (range 2-4). Post op IOOA was less than +1 in all the cases. Average preo-phypertropia angle was 25 prism diopiers (range 15- 55). Average post op angle was 7 prism diopiers (range 4-12).

DISCUSSION

In literature for DVD bilateral superior rectus recession of 5 mm with Faden operation or 8-12mm or even 9–16 mm sup rectus recession alone is recommended. Bilateral surgery has been almost always considered necessary. However all the patients in this study were found to have unilateral DVD and surgery in only one eye was found effective. An objective photographic analysis of ocular oblique muscle dysfunction has been described. Both the inferior oblique myectomy and anterior transposition procedures have been found to be effective in reducing IOOA with similar satisfactory results. DVD and hypertropia have been also been corrected similarly by these two surgical procedures. Initially Faden procedure was done in 3 cases. Exposure of sclera 15 mm behind insertion of superior rectus was a difficult task. An extra suture placed at muscle insertion is required to pull and rotate the eyeball forward. Other problem at 15 mm post to superior rectus insertion is the presence of sup oblique tendon which should be pulled forwards with the help of squint hook to expose the sclera. In the subsequent cases only superior rectus recession was done for the DVD. Combined bilateral superior rectus muscle recession and inferior oblique muscle weakening has also been practiced in the past for dissociated vertical deviation. Asymmetrical DVD is treated with asymmetrical surgery. Other options for DVD treatment include anteriorization of the inferior oblique muscle or anteriorization of the inferior oblique muscle with resection/myectomy. Inferior oblique anterior transposition (IOAT) should be done only in patients with inferior oblique overaction (IOOA) and dissociated vertical deviation (DVD) without fusional potential because the procedure can cause anti-elevation syndrome.

In hypertropic patients with inferior oblique overaction, disinsertion, recession, myectomy and anteriorization of inferior oblique has been described. Inferior oblique recession and disinsertion have been practiced for hypertropia but it is technically more demanding than myectomy. In our study all cases of inferior oblique over action were treated by myectomy which produced acceptable post op results. New surgical intervention for the weakening of the inferior oblique muscle by equatorial scleral anchor has also been described. In one case of hypertropia, in addition to inferior oblique overaction which is present in adducted position hypertropia was also present in abducted position to a lesser extent. In this case inferior oblique myectomy combined with contra-lateral inferior rectus recession corrected the hypertropia.

CONCLUSION

Dissociated vertical deviation (DVD) and hypertropia due to inferior oblique over action can be treated successfully and the surgery results are satisfactory.

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Rewarding Results of Surgery for Dissociated Vertical Deviation (DVD) & Hypertropia from Inferior Oblique Over-action.


Fig 1. Lt photograph. Preop. Right DVD

Right. Post op. After Rt Sup rectus recession 10 mm

1. Fig 2. Lt Preop. Right inferior oblique overaction.

2. Right. Post op, after myectomy
Convergence Insufficiency & its Relation to the Use of Cellular Phone

Mohammad Arif FCPS, Muhammad Usman MBBS, Farah Yousuf MPH

ABSTRACT

Objective: The purpose of this study was to evaluate relationship between convergence insufficiency and use of cellular phone for long duration.

Methodology: Prospective case controlled pilot study of 50 patients between ages of 5-20 years were studied during 4 months period 1st August to 30th November 2016 using optical devices (cellular phone) for prolong time (more than 6hrs daily). History was taken and visually acuity recorded. Symptoms related to this condition e.g. headache, asthenopia and eye strain were noted. Target for near point were used to assess NPC. Ocular motility tests were done in order to exclude movement disorder.

Result: Forty nine (49) out of 50 patients using cellular phone for more than 6 hours had significant NPC. There were also symptoms of eye strain and reading difficulties after short time in these patients. 50 control patients not using cellular phone or for less than 2 hrs had normal parameters.

Conclusion: This study revealed statistically significant co-relation between convergence insufficiency and prolonged use of cellular phone, putting tremendous strain on visual functions.

INTRODUCTION

Convergence insufficiency is defined as failure to maintain binocular vision at near targets resulting from misalignment of both eyes. Reported incidence is 2.25%-8.3% and is rare below 10 years. This ultimately result in asthenopic symptoms, presenting with headache, blurring of vision, watering eyes, eye-strain as well as inability to read for longer duration.

Two phases in convergence insufficiency have been suggested. One in early school age where great demand is put for near work for prolonged period and the second one is at presbyopic age where accommodative effort is increased in order to see clearly. Headache and intermittent diplopia occur forcing to halt study momentarily.

Various causes were propagated from time to time but near work, reading, computer use, lack of sleep and anxiety further aggravate the problem. There is exophoria that is greater at near than at distance. Near point of convergence is fundamental visual measure, defining closest point of fusion. The test is performed when the target is slowly moved towards patient. End point is when diplopia occurs or other eye deviates from target. It is noted as exophoria at least 4 prism dipters or NPC greater than 6 cm. Eye strain is a symptom complex with irritation to eyes, blurring of vision and headache. This is due to fatigue of ciliary and extra ocular muscles due to prolong accommodation for near work. Video display terminals are increasing day by day leading to tremendous problems for the personnel using these devices. So eye strain in emmetropes need to be worked thoroughly.

It was initially considered as neurotic manifestation of psychiatric disorder but it is definitely now a binocular dysfunction. Use of computers increasingly in everyday life is resulting in visual symptoms although there are contradictory reports about convergence insufficiency in this regard. Current study tries to co-relate the use of cellular phone for long hours and development of convergence insufficiency.

Use of cellular phones has significant impact on convergence insufficiency in children and young adults. Further studies are required to confirm these investigations.

PATIENTS AND METHODS:

The present study was prospective case controlled pilot study conducted in the department of ophthalmology Kuwait Teaching Hospital & Peshawar Medical College during 1st August to 30th November, 2016.
Eligibility criteria included age between 5-25 years with asthenopic symptoms particularly headache after near work or using optical devices specifically cellular phone or touch screen. Patients with convergence insufficiency were selected from eye OPD. Their biodata recorded on prescribed proforma recording age, gender, symptoms, reading difficulties, use of cellular phone and its duration. Near point convergence, diplopia, visual acuity and findings on slit lamp examination as well as fundoscopy were noted. At the same time ocular motility test were conducted.

Treatment was given in the form of pencil pushup for one month. Follow up was noted. Instructions were given to reduce the duration of use of cellular phone.

RESULTS:

Total numbers of patients with convergence insufficiency was 55 the number of control patients with normal convergence was 55. The mean age was 17 yrs, ranging from 10-25 yrs, median 19yrs, male 29(52%) female 26(47%)—NPC range 6-30cm, mean 13cm. The number of patients with asthenopic symptoms and diplopia were 50 (90%), the number of patients using mobile phone for more than 6hrs were 40, 6-10 hrs were 13 and 2-3 hrs were 2. 52(94%). Out of 55 patients using cellular phone for more than 6 hrs had convergence insufficiency as well as related ocular symptoms. 51(92%) out of 55 control patients had normal convergence using cellular for less than 2 hrs., visual acuity was 6/6 in both eyes in 50(90%) patients.

DISCUSSION:

Many teenager patients as well as parents of children with convergence insufficiency linger on in the neurology department to seek treatment for headache. Convergence insufficiency leading to asthenopia, headache and diplopia as well as reading difficulties in the present study address the increasing trend of using cellular phones for long hours meaning, more than 4 hours. The current pilot study revealed a significant correlation between asthenopic symptoms and related use of cellular phones. It has been indicated that small screen devices leads to fatigue of extra ocular muscles in convergence when utilized for long durations.

In the study by Borsting E et al, 469 children were initially screened. It revealed a strong association between signs of convergence insufficiency and increasing symptoms of convergence insufficiency. CITT pilot study carried out by Mitchell Scheiman et al, while focusing on CI treatment in multi-central clinical trial, 47 children with age range 9-18 years had CI, exodeviation of more than 4D was noted. In the current study mean age was 19 years ranging from 6-25 years. Mean NPC was 13cm (range-6-30 cm). Standard criteria for CI is more than 6cm NPC. Mitchell Scheiman et al in his other article on CI in childhood concluded that office based vision therapy was reported to be successful in 75% of patients with improved symptoms and signs. NPC was also receded to normal. Our current study showed effective improvement of symptoms with pencil pushup exercise.

In the study by Porcar et al, 65 university students were studied for convergence insufficiency and binocular dysfunction, 7.7% had convergence insufficiency. It further revealed an extra burden during reading and near work because of excessive eye strain.

Futyma. E et al in his article while evaluating visual function in employees working with computers reported no change in employee’s visual functions while using computer monitoring. Our current study revealing change in visual functions because of small screens (cellular phones). Rouse MW et al reported 13% 5th and 6th grader children had convergence insufficiency. Total number of student screened was 684. Letourneau JE et al conducted a study on 735 school children between the ages of 7-14years. 9% of the participants had NPC more than 10cm. It also reported no relationship of CI with school achievement.

Matti Westment et al studied the effect of orthoptic exercises on relieving symptoms of convergence insufficiency on 135 patients. 59.5% of children with CI had significant improvement in asthenopic symptoms following treatment. The limitation of this study was lack of control and retrospective design. The current study had 55 patients in control group and also our study was prospective.

D J Bhanderi in a community based study on 419 subjects on association of computer work with asthenopic symptoms found that 46.3% suffered from asthenopic symptoms. There was association between duration and type of screen setting used. Our current study deliberated on duration of use of small screen devices. C Blehm et al on study of computer use related the symptoms to dry eyes and accommodative spasm.

Schieman et al performed a study on 2023 patients between the group of 6 years to 18years aging, it was revealed that accommodative and binocular visual dysfunction were 9.7 times more prevalent than ocular pathologies.

A retrospective study by Daum KM on 114 subjects with accommodative dysfunction revealed asthenopic symptoms including headache and blurred vision in 96 patients. The limitation of this study was its retrospective nature and no control group. Y Cohen et al, correlated asthenopic symptoms to reading comprehension. This study was performed on 66 children between 8-10years. Our study did not address the issue of reading disabilities in the student population. Pearce KL in his study on correlation of sports related concussion to near point of convergence found 42% of patients had convergence insufficiency. He suggested routine screening for NPC in evaluating patients with concussion due to sport trauma.
Current study supports the view with strong evidence that use of cellular phones has significant impact in emergence of convergence insufficiency. Large scale study will be conducted in the above mentioned age group of children and young adults in order to further investigate the issue.

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Surgical Management of Hypotropia

Khawaja Khalid ShoibFCPS, FRCS, Idrees AhmedFRCS, Muhammad Manzoor FCPS

ABSTRACT

Objective. To find the results of surgery for hypotropia

Materials and Methods. Operations performed for hypotropia from 1 st Jan 2016 to 30 Dec 2016 in Mughal Eye Hospital Lahore were analyzed to find out the affectivity of muscle surgery. Preoperative assessment included recording of vision, cycloplegic refraction and measurement of angle of squint by Hirschberg/ prism cover test using a prism bar. Inferior rectus recession was done in 15 cases.

Results: Inferior rectus recession alone of 3-5 mm was done in 13 cases. Average pre-hypotropia angle was 20 prism diopters (range 10-30). Average post op angle was 5 prism diopters (range 3-12). In all cases inferior rectus recession corrected the pseudoptosis however ptosis surgery was done subsequently in all the cases (except two). In one case of 30 hypertropia, inferior oblique myectomy combined with contralateral inferior rectus recession corrected the hypertropia. No ptosis surgery was required in this case. In another patient with 76 (38 degrees) Knapp procedure resulted in 5 prism diopters of hypertropia and 40 20 degrees) exotropia. One patient developed orbital cellulitis following the surgery which resolved with systemic antibiotics.

Conclusion: Hypotropia can be treated successfully and the surgery has satisfactory results.

Keywords: Vertical squints, Hypotropia, Knapp Procedure, Inferior Rectus recession

INTRODUCTION

Hypotropia is encountered most commonly in Monocular elevation deficiency previously called double elevator palsy in which there is presence of pseudoptosis/ ptosis also. Monocular elevation deficiency (MED) is classified as three subtypes: 1) restrictive form, with features including positive forced duction test (FDT) for elevation, normal elevation forced generation test (FGT), and elevation saccadic velocity, often an extra or deeper lower eyelid fold on attempted up gaze and poor or absent Bell phenomenon; 2) paretic form with elevator muscle weakness, with features including free FDT, reduced elevation FGT and saccadic velocity, in which the Bell phenomenon is often preserved; and 3) a combination form, with features including positive FDT for elevation and reduced FGT and saccadic velocity for elevation.

Indications for surgery are vertical deviation in primary gaze, deviation-induced amblyopia, diplopia in primary gaze, and restricted binocular fields. The goal of surgery is to improve the position of the affected eye in primary gaze, by increasing the field of binocular vision.

In the presence of resistant to elevation on forced duction test, inferior rectus recession is done while large pre-hypotropia requires Knapp procedure in which transposition of medial and lateral recti to the insertion of superior rectus is done.

Hypotropia can be treated successfully and the surgery has satisfactory results.

MATERIALS AND METHODS

Operations performed for hypotropia from 1st Jan 2016 to 30 Dec 2016 in Mughal Eye Hospital Lahore were analyzed to find out the affectivity of muscle surgery. Only patients of monocular elevation deficiency were included in the study. A retrospective chart review was performed and patients with a positive history of trauma or with a diagnosis of myasthenia gravis, thyroid ophthalmopathy, and Brown syndrome were excluded. Preoperative assessment included recording of vision, cycloplegic refraction and measurement of angle of squint by Hirschberg/prism cover test using a prism bar. The evaluation of the FDT was done at the operating room before surgery, and surgical planning was based on the obtained Hypotropia was corrected by 5 to 8 mm inferior rectus recession or Knapp procedure. Inferior rectus recession was done in 15 cases. Post op measurement of angle of squint was again done by Hirschberg/prism cover test. Preoperative and post operative photograph/video clips were taken. Cases were followed up for minimum of 3 months (average 5 months range 3 to 8 months).

RESULTS

Inferior rectus recession alone of 3-5 mm was done in 13 cases. Average preop hypotropia angle was 20 prism diopters (range 10-30). Average post op angle was 5 prism diopters (range 3-12). Out of these 13 cases...
one patient, 50 years old lady had history of trauma and operation in childhood and had the least improvement in hypotropia. In one case of 30 hypotropia inferior oblique myectomy combined with contralateral inferior rectus recession corrected the hypotropia. In all cases inferior rectus recession corrected the pseudoptosis. However, ptosis surgery was done subsequently in all (except two cases, one case) the cases. Patient in was satisfied with her correction of pseudoptosis and was not interested in ptosis surgery. In one patient with 76 (38 degrees) Rt. hypotropia inferior rectus recession was done. It resulted in residual hypotropia of 40 (20 degrees). Knapp procedure was done which overcorrected hypotropia and resulted in 4020 degrees) hypertropia. Inferior rectus was advanced to bring back its attachment to original insertion point with 3 mm resection resulted in 5 prism diopters of hypertropia and 40 20 degrees) exotropia. One patient developed orbital cellulitis (following the inferior rectus recession and ptosis surgery) which resolved with systemic antibiotics. Lt eyeball position has been corrected though ptosis recurred after the infection.

**DISCUSSION**

“Double elevator palsy” eye supra-duction during stage II general anesthesia supporting hypothesis that it is absence of function of a unilateral center for supra-duction, thus having supra nuclear etiology and not a palsy. Inferior rectus recession in all the cases (except two, one in which Knapp procedure was done and second in 50 year old lady) achieved satisfactory outcome. Full tendon width vertical transposition of horizontal recti (Knapp procedure) is preferred when there is no restriction on forced duction test and hypotropia is more than 25. In large hypotropia cases inferior rectus recession is combined with Knapp procedure.1, 2, 3, 4, 5,

In one patient 8 mm inferior rectus recession corrected 18 of hypotropia. When it was combined with Knapp procedure it produced a total of 76 difference in the angle of squint. In one patient who developed orbital cellulitis following the surgery left eyeball position has been corrected though she may require revision of ptosis surgery.

All the complications of squint surgery are also possible in this type of squint surgery which is evident from occurrence of infection and under-correction/ overcorrection in this series. In literature (Knapp procedure) alone was found to have correction of 21 hypotropia while Knapp procedure combined with inferior rectus recession was found to have 37.5 correction.6 Operating three muscles of an eye can induce anterior segment ischemia.7, 8 Callahan advocated Jensen type split of muscles and transposing superior halves of horizontal recti to sup rectus with recession of inferior rectus in some cases.9 Three muscle surgery is done usually in young individuals only. However, Knapp procedure is not graded and has unpredictable amount of correction. Besides this, there is drift towards overcorrection with time and limitation of movements in extreme adduction and abduction. Superior rectus resection and inferior rectus recession (vertical R&R) depending upon amount of preoperative deviation has also been described.10 Contralateral superior rectus recession11 or combined with inferior rectus recession alone has also been described.

In patients of double elevator palsy, inferior rectus recession and superior oblique tenotomy on paretic eyes has been recommended for those who fixate with the healthy eye while superior rectus recession was performed on healthy eyes after six months. The patient fixating with the paretic eye were managed by superior rectus recession and inferior oblique tenotomy on healthy eyes.12

**CONCLUSION**

Hypotropia can be treated successfully and the surgery has satisfactory results.

**REFERENCES**

Surgical Management of Hypotropia

1. Fig 1. Lt photograph. Preop. Left hypotropia
2. Right photograph. Post op. After Lt Inf Rectus recession

Fig 2. Lt photograph. Preop. Left hypertropia
2. Right photograph. Post op. After Lt Inf Oblique Myectomy + Rt Inf R recession

Fig 3.
     Rt. photo after elevating lid
  b. Lower row. Post op photographs
     Lt. after Rt. Inf Rectus recession. Rt hypotropia 20 degrees.
     Rt. after Rt Knapp procedure Rt. hypertropia 20 degrees.

Fig 4. Left photo Preop Lt hypotopia. Middle photo Post op cellulitis.
Retinal Nerve Fiber Layer Changes on Optical Coherence Tomography in Suspected Cases of Glaucoma.

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Dow University of Health Sciences, Karachi

ABSTRACT:

Objective: To assess retinal nerve fiber layer changes on optical coherence tomography in suspected cases of glaucoma.

Methodology: 127 cases suspected of having glaucoma on clinical findings and referred to the eye diagnostic section of Civil Hospital, Karachi over a period of 3 months were included in the study. These patients underwent optical coherence tomography and retinal nerve fiber layer changes were subsequently analyzed.

Results: 52 eyes had normal RNFL measurements and 75 had positive changes in the RNFL.

Conclusion: Significant number of eyes had RNFL changes which needed to be started on treatment.

Keywords: Optical coherence tomography, retinal nerve fiber layer, glaucoma.

INTRODUCTION:

Glaucoma is one of the important diseases leading to blindness if undiagnosed. Therefore it is imperative to detect it in the initial stages and start appropriate treatment(1). Previously optic disc cupping and neuroretinal rim changes on fundoscopy were given most importance for diagnosing glaucoma. Nowadays optical coherence tomography (OCT), confocal scanning laser ophthalmoscopy (HRT) and scanning laser polarimetry have gained importance in finding out early changes(2).

OCT assesses loss of ganglion cells and details of the axons and ganglion cell bodies, 34% of the macular thickness is attributed to the ganglion cells(3). In glaucoma the early changes are ganglion cell death which can lead to decreased thickness of the macula(2).

Dissection of optic nerve has also been done to assess retinal ganglion cell loss(4). Changes in visual fields occur much later than those in the retinal nerve fibre layer and optic nerve head(5). The damage to the retinal nerve fibre layer and ganglion cell layer is irreversible(5). The ganglion cells and the retinal nerve fibre layer are closely associated. The ganglion cell complex comprises three layers in the retina, the axons form the nerve fibre layer(6).

When the superior and inferior quadrants of the disc are involved there are more chances of profound visual field defects. This is explained by the arrangement of axons of ganglion cells in the disc(6). The technology of OCT is evolving steadily. The spectral domain OCT has much higher scanning speed that is 25,000 A scans per second compared to time domain OCT. It produces a 3D image of the retina(7). Older version was time domain OCT which has a resolution of 400 scans per second(8). Swept Source OCT (SS – OCT) is the latest version of OCT in which a frequency swept laser is incorporated(9).

All glaucoma suspected patients should undergo OCT for positive RNFL changes, which is in conjunction to the clinical changes, as OCT is significant and merits before starting anti-glaucoma treatment. It should benefit the patients for further progression of the disease and the patients should remain under regular follow up clinically as well as by further OCTs.

METHODOLOGY:

3D optical coherence tomography 2000 (FA plus) version 7.2x was used. Manufacturer Topcon. It is a non-contact, high resolution tomographic and bi-microscopic imaging device. It is indicated for axial, cross-sectional and 3D imaging and measurement of posterior ocular structures (including retina, retinal nerve fiber layer, macula and optic disc.

The patients pupils are dilated fully with tropicamide. Illumination is by near infrared light which is emitted by the fundus illumination optical system. The fundus photography optical system forms an image on the camera and the image can be observed on the monitor.

Cases suspected of having glaucoma on clinical findings referred for OCT to the diagnostic section of eye department of Civil Hospital Karachi over a time period of three months will be part of the study. Retinal
nerve fiber layer changes will be analyzed for early detection of glaucoma.

**Sample size** was calculated by open epi program and came out to be 162 patients.

**Statistical analysis** was done by descriptive analysis and t-test was performed.

**RESULTS:**

Total number of eyes included in the study was 127 out of which 52 eyes had normal RNFL measurements. 75 eyes had positive RNFL changes. The male and female participants in the study were equal.

**Statistical Analysis:** Descriptive statistics of the thickness were expressed with mean and standard deviation. Independent samples t-test was executed to compare thickness measures between RNFL status, gender and site of the eye. Stratified results with respect to ENF status were presented to show values of thickness between gender and sites of the eyes. The threshold to indicate significant difference was set at P value less than or equal to 0.05.

**DISCUSSION:**

In our study we analyzed the retinal nerve fiber layer thickness changes. This was done in glaucoma suspect patient. 126 number of eyes were included in the study. The average thickness in females was 96 microns and in males 84 microns (table 1). For detecting glaucoma progression and its diagnosis in addition to OCT, SLP (Scanning laser polarimetry) is used. In a study conducted in Canada by O'Leary and associates 61 patients and 33 controls underwent SLP and OCT for RNFL changes. They claim to be the pioneers in conducting such a study which incorporates both imaging modalities.

Another investigation tool is confocal scanning laser ophthalmoscopy. The most accurate evaluation of the RNFL however is done by OCT as it directly measures RNFL. In a study by Hwang and Kim the neuroretinal rim was analyzed in the nasal and temporal areas by OCT. This has also been found to be helpful for diagnosis of glaucoma. In our study average thickness in both genders merged in normal

**TAB. 1 Gender**

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
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<th>Male</th>
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**TAB:2 Eyes merged**

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**TAB:3 Eyes with RNFL changes**

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**TAB:4 Normal eyes coded**

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**TAB. 1 Gender**

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Retinal Nerve Fiber Layer Changes on Optical Coherence Tomography in Suspected Cases of Glaucoma.

eyes was 101 microns and in those with change was 82 microns(table 2). Not much difference in between right and left eyes in average thickness in those with RNFL change was seen but superior thickness average was 101 microns in left eyes and 92 microns in right eyes(table 3).

In a study by Banitt, Ventura et al, pattern electro-retinography and OCT were done. It was seen that the signals of PERG are reduced in glaucoma suspects. Also the changes in PERG are detected much earlier than the RNFL changes on OCT with a time difference of about 8 years(15). Scanning laser polarimetry and visual fields in the same patients were also compared. Co-relation between these two criteria wasn’t good. At least three SLP scans need to be done each time(16).

In a study by Sommer et al it was found that about 6 years prior to alteration in fields there was detectable thinning of retinal nerve fiber layer in 60% patients.(17).

To differentiate between normal eyes and eyes with pathology, the average thickness and inferior thickness of the retinal nerve fiber layer are considered to be the best criteria(18). We saw that in normal eyes there was a difference in average RNFL thickness between the right and left eyes(table 4).The final analysis of our study has been merged in table 5.

CONCLUSION:

127 glaucoma suspect eyes were analyzed out of which 75 had positive RNFL changes. This in conjunction to the clinical changes for which the patient was referred for OCT, is significant and merits starting anti-glaucoma treatment. It should benefit the patients by halting further progression of glaucoma. The patients should remain under regular follow up clinically as well as by further OCTs.

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Incidence of Angle Recession Glaucoma amongst Patients presenting with highly suspicious Clinical Features after Blunt Trauma to the Eye.

Bilal Khan FCPS¹, Muhammad Iqbal MBBS², Muhammad Idrees FCPS³.

ABSTRACT

Objective: To know about frequency of angle recession glaucoma in those patients who present with suspicious clinical features after blunt trauma to the globe.

Methodology: This prospective observational study was conducted in Khyber Institute of Ophthalmic Medical Sciences (KIOMS) Hayat Abad Medical Complex, Peshawar from 25th April 2012 to 24th October 2012 with total 6 months duration. All the patients having age greater than 18 years with either genders presenting after blunt trauma to the globe with suspicious clinical features and angle recession of greater than 180° were included while patients with chronic glaucoma and having blast injuries to the globe were excluded from the study. Patient’s age, gender, frequency of angle recession glaucoma in blunt trauma to the globe, and distribution of it based on age and gender were documented on predesigned performa. All the data was analyzed by spss version 20 and results were presented in tables.

Results: Total 103 patients were included in the study in which males were suffered most from blunt trauma to the globe with 64(62.14%) cases and the most common age group was from 31 to 45 years having 40(38.85%) cases. In all those cases angle recession glaucoma was present in 16(15.53%) cases. Among positive cases patients from age 31 to 45 years were suffered most having 7(17.5%) cases while based on gender it affected males 10(15.6%) predominantly.

Conclusion: Angle recession glaucoma, though rare after blunt trauma to the globe but it mostly affects middle age population with males predominantly.

Key Words: Angle recession glaucoma, Blunt Trauma, Globe, Males, Middle age

INTRODUCION

According to the world health organization (WHO) global estimation in 2002 more than 161 million people were visually impaired, of whom 124 million people were blind worldwide. It was also estimated that up to 75% of all blindness is avoidable¹. The prevalence of blindness in Pakistan was found to be 2.7 %(144000) by national health survey of Pakistan in year 2003². Glaucoma is the 2nd leading etiology of blindness globally, according to WHO survey in 2002. It accounts for 12.3% of global blindness (vision 20/200 in better eye )³. It is suggested that in 2020 60.5 million people can suffer from glaucoma³ and glaucoma was found to be the fourth most common cause of blindness in Pakistan⁴.In Pakistan primary open glaucoma is the most common followed by primary angle closure, aphakic, secondary and congenital glaucoma⁵. The causes of secondary glaucoma are mainly four folds; neovascular, uveitis, lens induced and trauma. Infectious uveitis and cataract are special risks for secondary glaucoma leading to the blindness in the 3rd world⁶-⁷. Traumatic glaucoma develops due to the closed and open globe injuries. secondary glaucoma after trauma is most likely occur with closed globe injuries but it is often under diagnosed because its onset may be delayed and the history of eye injury may be remote or overlooked⁸. In one study blunt trauma was the mode of injury in 85% of cases, play related like cricket ball, tennis ball, gulli danda, hockey stick, bamboo stick and stone in 30% cases, fire cracker injury in 20% cases and 50% were work related assaults or accidental injury ¹.

The management of cases of angle recession glaucoma after trauma poses serious problems. Those with less than 180° of recession are unlikely to develop late glaucoma and need not to be followed. However, 15% of cases over 180° may eventually develop glaucoma. If not detected at an early stage, considerable visual damage can result. Patients should be advised to attend the clinic for a longer period even after a trivial injury for raised IOP and further assessment.

Angle recession is a common manifestation of blunt ocular trauma and involves rupture of the ciliary body face resulting in a tear between the longitudinal and circular fibers of ciliary muscle. Angle recession is reported to occur in 20 to 94% of eye after blunt trauma and is often masked initially due to the presence of concomitant hyphema. Approximately 5 to 20% of eyes with angle recession develop angle recession glaucoma⁹. Onset is extremely variable and may occur soon after the initial trauma or even years later, indicating possibly separate pathologic mechanisms. The risk of
Incidence of Angle Recession Glaucoma amongst Patients presenting with highly suspicious Clinical Features after Blunt Trauma to the Eye.

Developing angle recession glaucoma appears to be related to the extent of angle recession. Angle recession of more than 180 degrees is deemed a considerable risk for secondary glaucoma. Careful examination of the eye after blunt trauma is important to identify people who are at more risk of developing secondary glaucoma later with special emphasis on angle depth, angle recession, heavy pigmentation, pseudo exfoliation, Hemorrhage and inflammatory changes. Clinically the presence of increased pigmentation at the angle, elevated baseline intraocular pressure, hyphema, lens displacement and angle recession of more than 180° were significantly associated with the occurrence of chronic glaucoma after closed globe injury. On ultrasonography bimicroscopy findings a wide angle and the absence of cyclodialysis were significant predictors for subsequent development of traumatic glaucoma. In one study out of total 2650 glaucoma suspects 13% of eyes with history of trauma developed secondary glaucoma. Features like angle recession of greater than 180 degrees, sphincter tear, hyphema, iridodialysis, subluxation, dislocation, vitreous hemorrhage, retinal detachment and cataract could be seen in various combination.

The rationale of the current study is to determine the frequency of angle recession glaucoma among patients presenting with the history of trauma and having a pre defined set of highly suspicious clinical features. Since it is one of the over locked cause therefore it can lead to visual loss due to development of glaucoma. Since no local study is available on the same topic therefore it will give us the burden of the disease in our set up and this will create a basis for the future researchers.

**MATERIAL AND METHODS**

After taking consent from the ethical research committee of the hospital, this prospective observational study was conducted in Khyber Institute of Ophthalmic Medical Sciences (KIOMS) Hayatabad Medical Complex, Peshawar from 25th April 2012 to 24th October 2012 with total 6 months duration. All the patients having age greater than 18 years with either genders presenting after blunt trauma to the globe with suspicious clinical features and angle recession of greater than 180° were included while patients with chronic glaucoma and having blast injuries to the globe were excluded from the study. Patient’s age, gender, frequency of angle recession glaucoma in blunt trauma to the globe, and distribution of it based on age and gender were documented on predesigned performa. All the data was analyzed by SPSS version 20 and results were presented in tables.

All those patients who were admitted with the blunt trauma to the globe were evaluated by history, clinical examination followed by slit lamp examination, fundoscopy, gonioscopy and ultra sonographic bimicroscopy. Baseline treatment was given to all patients and patients were followed up to 6 weeks for detection of angle recession glaucoma. At the end of 6th week follow up the frequency of angle recession glaucoma in patients was assessed.

**RESULTS**

Total 103 patients of traumatic globe injuries with suspicious clinical features were included in the study. There were 64(62.14%) males and 39(37.86%) were females. Males to females ratio was 1.64; 1 (Figure 1). Average age of the patients was 48.53 ±1.6SD with range of 20-78 years. Patient’s age was divided into four groups in which the most common group which suffered from blunt trauma to the globe was 31-45 years. There were 14(13.6%) patients of age less than 30 years, 20(19.4%) in age range of 46-60 year and more than 60 year patients were 29(28.2%) (Table 2). The angle recession glaucoma in patients with highly suspicious clinical features after trauma to the globe was observed in 16(15.53%) while in 87(84.47%) patients there was no angle recession glaucoma (table no 3). Age wise distribution of angle recession glaucoma showed that angle recession glaucoma has no such role over age in our study. The patients having age less than or equal to 30 years have angle recession glaucoma 14.3% while no angle recession was 85.7%. Age group 31-45 years contain 17.50% angle recession glaucoma and 82.55 showed no angle recession glaucoma, 46-60 years age group had 15% angle recession glaucoma with 85% no angle recession glaucoma and patients greater than 60 years of age had 13.8% angle recession glaucoma while 86.2% had no angle recession glaucoma with high suspicion of clinical features after blunt trauma to the globe (Figure 4). Gender wise distribution of angle recession glaucoma with high suspicion of clinical features after blunt trauma to the globe showed that there were 15.6% male patients with angle recession glaucoma while in 84.4% patients it was absent. Similarly in females it was present in 15.4% patients and was absent in 84.6% patients (Table 5).

**TABLE 1:** Gender wise distribution of patients with globe trauma (n=103)

<table>
<thead>
<tr>
<th>Gender of patients</th>
<th>No of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>64</td>
<td>62.14</td>
</tr>
<tr>
<td>Females</td>
<td>39</td>
<td>37.86</td>
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</tbody>
</table>

**TABLE 2:** Age wise distribution of patients with globe trauma (n=103)

<table>
<thead>
<tr>
<th>Age of patients in years</th>
<th>No of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
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<tr>
<td>≤30</td>
<td>14</td>
<td>13.6</td>
</tr>
<tr>
<td>31-45</td>
<td>40</td>
<td>38.8</td>
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<tr>
<td>46-60</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>61+</td>
<td>29</td>
<td>28.2</td>
</tr>
</tbody>
</table>
Incidence of Angle Recession Glaucoma amongst Patients presenting with highly suspicious Clinical Features after Blunt Trauma to the Eye.

TABLE 3: Angle recession glaucoma in patients with suspicious clinical features after trauma to the globe (n=103)

<table>
<thead>
<tr>
<th>Status of angle recession glaucoma after trauma to the globe</th>
<th>No of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>16</td>
<td>15.53</td>
</tr>
<tr>
<td>Absent</td>
<td>87</td>
<td>84.47</td>
</tr>
<tr>
<td>46-60</td>
<td>20</td>
<td>19.4</td>
</tr>
<tr>
<td>61+</td>
<td>29</td>
<td>28.2</td>
</tr>
</tbody>
</table>

TABLE 4: Age wise distribution of angle recession glaucoma in patients of traumatic globe injury with suspicious clinical features. (n=103)

<table>
<thead>
<tr>
<th>Age groups in years</th>
<th>No of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>≤30</td>
<td>2(14.3%)</td>
</tr>
<tr>
<td>31-45</td>
<td>7(17.5%)</td>
</tr>
<tr>
<td>46-60</td>
<td>3(15%)</td>
</tr>
<tr>
<td>60+</td>
<td>4(13.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>16(15.5%)</td>
</tr>
</tbody>
</table>

TABLE 5: Gender wise distribution of angle recession glaucoma in patients of traumatic globe injury with suspicious clinical features (n=103)

<table>
<thead>
<tr>
<th>Age groups in years</th>
<th>No and percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Females</td>
<td>6(15.4%)</td>
</tr>
<tr>
<td>Males</td>
<td>10(15.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>16(15.5%)</td>
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</tbody>
</table>

DISCUSSION

Previous studies have identified factors which increase the risk of failure of glaucoma filtering surgery. These include general factors such as young age, race and ocular factors such as previous failed glaucoma filtration surgery, active anterior segment neovascularization, and chronic ocular inflammation. Late post traumatic angle recession glaucoma has been refractory to therapy in several studies reporting the results of glaucoma filtering surgery 14,15,16. Glaucoma occurs as a late complication of trauma and has been reported to develop in 2 -10 % of patients with post traumatic angle recession 17,18. The presence of angle recession is regarded as a sign of previous blunt trauma and reduced aqueous drainage probably occurs because of other pathological changes within the trabecular meshwork 17,19. Because eyes with traumatic glaucoma respond to topical corticosteroids provocation in the same way as those with primary open angle glaucoma, it has been suggested that only eyes with underlying tendency to open angle glaucoma will develop a late increase in intraocular pressure after blunt trauma 20,21.

The question of whether eyes with angle recession glaucoma respond to filtering surgery in the same way as those with primary open angle glaucoma has not been answered. However a precious study showed that the results of Molteno implantation of patients with angle recession glaucoma were poor. It was found that the overall success rate of angle recession glaucoma (6/13,46%) was worse than in patients with aphakic or pseudophakic glaucoma (9/16,56%) or in patients undergoing this surgery after a previous failed trabeculotomy (10/14,71%) 22. Blanton in his series of 130 patients noted that two peaks incidences of glaucoma after angle recession, the early peak occurred within the three years of injury and the late peak at 10 or at a later year suffered the injury to the globe. The five cases of glaucoma occurring within the 3 years of injury all eventually reverted to the normal intraocular pressure within 1 year. 4 cases of glaucoma were diagnosed 10 or more years later after the injury, whereas non of the 64 cases examined between 3 to 10 years of the injury had glaucoma. 4 cases of late glaucoma had more than 180° of angle recession 23.

Alper noted 14 cases of glaucoma in his series of 27 cases, 8 of these were diagnosed within 4 years of injury and the remaining 6 cases were more than 14 years after trauma. 5 of these late cases had 24 or more of angle recession and the remaining cases had 50° recession. His findings tend to support Blanton’s observations that there are 2 peak incidences of glaucoma 24. Tonjum diagnosed one case of glaucoma after 6 years after the injury in his series of 160 patients 25. From the observation of Alper, Blanton and Tonjon, it is clear that the cases most at risk of developing late chronic unilocular glaucoma are those with angle recession of 180° or more, the remaining cases having recession of 150°.

As would be expected from the findings of Wolf and Zimmerman, the gonioscopic appearances of early and late recession differ in the ciliary muscles in sharply demarcated, whereas in the late cases the cleft is no longer so clearly defined because of the process of healing and fibrosis which occurs in association with the development of a hyaline membrane over the angle structures. In the late cases the angle recession may be overlooked unless careful comparison is made with uninjured eye 26.

These results confirm those of previous workers (Tonjum 26, Mooney 27) that angle recession is almost invariably present after a macroscopic hyphema. A high proportion of patients who have had a prolonged primary hyphema shows extensive angle recession. The incidence of angle recession in this series (15%) agrees closely with that found by Blanton who noted a 20%
incidence of angle recession in a series of 182 eyes, the reported incidence of angle recession following ocular contusion complicated by hyphema varies from 20-94%.

CONCLUSION
The management of cases of angle recession glaucoma poses several problems. It would appear that those with less than 180° of recession are extremely unlikely to develop late glaucoma and these cases need not to be followed. However up to 15% of cases with 1800° or more of the recession may eventually develop late glaucoma. If these cases are not detected at an early stage, the patients concerned are not likely to seek medical advice until considerable visual loss has resulted from the development of glaucoma. It seems a lot to expect patients to continue to attend the clinic for a checkup for as long as 20 years after sustaining what may appear to have been a trivial injury; nevertheless, an attempt should be made to check the intraocular pressure in all cases of angle recession of 180° or more, annually for an indefinite period.

REFERENCES
PROPRACAINE AS A TOPICAL ANAESTHETIC FOR INTRAVITREAL (IVT) INJECTIONS

Hafsa Malik, MBBS, FCPS, and Imran Saleem Channar, FCPS

ABSTRACT

Objective: To evaluate the efficacy of Proparacaine 0.5% as a topical anesthetic during intra-vitreal (IVT) injection procedures.
Study Design: Quasi-Experimental study.
Place and Duration: Eye Unit-II, Bahawal Victoria Hospital, Bahawalpur, from December 2016 to April 2017.
Methodology: Thirty patients (30) needing IVT bevacizumab for macular edema (ME) secondary to diabetic retinopathy (DR) and retinal vein occlusion (RVO) were administered IVT injection under topical anesthesia using proparacaine 0.5% eye drops. IVT injections were performed using sterile technique. Each patient was instilled a drop of proparacaine eye drops 4-5 times before administering the injection. 0.5ml (1.25mg) of the bevacizumab solution was injected into the core vitreous. Once the IVT injection had been administered, each patient was asked about the intensity of ocular pain and discomfort experienced during the procedure. A grading scale based on pain score called Visual Analog Score (VAS) was used to evaluate the subjective pain experienced by the patients. Computer software SPSS (version 10) was used to analyze the data. Results were considered statistically significant at p<0.05.
Results: It was possible to perform all the IVT injection procedures under topical anesthesia using 0.5% Proparacaine eye drops without a need for supplemental subconjunctival (SC) or peri/retrobulbar injections. Pain reported by the patients, as recorded on a Visual Analog Scale (VAS), was mild to moderate in majority of the patients.
Conclusion: Topical proparacaine 0.5% is a safe and effective anaesthetic during IVT injection procedures. The optimal intensity and duration of anesthesia produced by this anaesthetic agent permits performing the IVT injections with low subjective pain and a resultant better patient compliance.
Key words: Anesthesia; Bevacizumab; Intravitreal injection; Visual analog scale.

INTRODUCTION

IVT injection represents an efficient method to achieve high intraocular levels of drugs into the posterior segment of the eye. For many years, this method has been used for the IVT administration of antiviral, antibiotic/antifungal, steroids and gases. Since the mid of the previous decade, with the advent of anti-VEGF injections as an effective therapy for neovascular age-related macular degeneration (AMD) and for macular edema (ME) due to DR/RVO, IVT injections have become one of the most common intraocular procedure performed worldwide. The repeatability of the anti-VEGF injections for a sufficient vision-saving treatment and the fact that the patient is required to return on a regular basis for subsequent injections have turned patient comfort into a crucial parameter during the overall procedure.

The primary goal of anesthesia during IVT injection is to increase the patient comfort and compliance by producing akinesia and preventing involuntary lid closure during needle insertion. An ocular anesthetic technique that minimizes patient discomfort and risk of complication is important to consider while using IVT agents. Many approaches to ocular surface anesthesia have been reported and include topical drops, anesthetic-soaked applicators, gels, and SC injection of anesthetics.

Topical proparacaine 0.5% is a safe and effective anaesthetic during IVT procedures. The optimal intensity and duration of anesthesia produced permits IVT injections with low subjective pain and a resultant better patient compliance.

The exact mechanism by which local anesthetics act is unknown; however, several studies indicate that local anesthetics may limit sodium ion permeability by closing the cell membrane channels through which the ions migrate into the lipid layer of the nerve cell membrane. This limitation prevents the fundamental change necessary for the generation of the action potentials.

The injection of local anesthetic solutions is frequently an unpleasant experience for the patient. Infiltration of the skin and subcutaneous tissues with...
local anesthetic solutions produces pain, burning and discomfort, which is often severe enough to be the most unpleasant part of a minor surgical procedure like IVT injection. The pain experienced on injection of local anesthetic solutions is in part related to the pH of the solution and this is particularly true for the solutions with added adrenaline. Additionally, the injection of anesthetic with a sharp needle may result in complications such as SC hemorrhage, chemosis and globe perforation.1-10

In the recent times, many new and effective anesthetic agents have been tested in ocular surgery. Proparacaine is one such anesthetic agent which has been shown to have a great margin of safety with a long lasting anesthetic effect during ocular surgery. Proparacaine hydrochloride solution is a rapid acting local anesthetic suitable for ophthalmic use. With a single drop, the onset of anesthesia occurs in approximately 15 seconds and persists for 15 minutes.10,11,12 The main site of action of this drug is the nerve cell membrane where it interferes with the large transient increase in the membrane permeability to sodium ions that is normally produced by a slight depolarization of the membrane. As the anesthetic action progressively develops in a nerve, the threshold for electrical stimulation gradually increases and the safety factor for conduction decreases; when this action is sufficiently well developed, block of conduction is produced leading to the anesthetic effect.

Proparacaine 0.5% has already established its role as a topical anesthetic in cataract surgery. All of the published data about this topical anesthetic suggests that proparacaine 0.5% solution provides adequate anesthesia and patient comfort during the phacoemulsification technique of cataract extraction.10-13 To date, there is a lack of evidence in published literature whether this topical anesthetic is effective or not in other ophthalmic surgical procedures like IVT injection. In view of this, we decided to evaluate the effectiveness of topical proparacaine as an anesthetic agent during IVT injection delivery.

MATERIAL AND METHODS

This study was conducted at eye unit-II, B.V.Hospital, Bahawalpur from December 2016 to April 2017. The permission for the study was taken from the local ethical committee of our hospital. Patients having ME secondary to DR or RVO and requiring IVT bevacizumab injection were included in the study. A full informed consent was taken from all the patients regarding the surgical procedure and the use of topical anesthesia using proparacaine 0.5% eye drops before and during procedure.

Patients having psychiatric illness, deafness, anxiety and language barriers were excluded from the study. All patients underwent a complete ocular examination, slitlamp biomicroscopy of the anterior segment of the eye and slitlamp fundus examination using indirect fundus viewing lens (+90D). In all patients, ME was quantified by performing optical coherence tomography (OCT) of the macula.

All patients were given IVT injections using topical proparacaine 0.5% eye drops. The drug was administered to each patient at a rate of one drop/5 minutes for 4-5 times before IVT injection delivery.

Patients were informed beforehand that if the topical anesthesia with proparacaine was inadequate, a traditional SC or retrobulbar infiltration could be made at their request. All IVT injections were administered by the authors using standardized protocol. Each Patient was placed in supine position on operation table. 10% povidone iodine swab was placed into the inferior cul-de-sac and the patient was advised to blink multiple times so as to spread the antiseptic solution on to the ocular surface. The exact location of the injection site was marked from limbus as 3.5 mm for pseudophakic and 4.0 mm for phakic patients. After marking, an indentation was produced at the desired injection site using the tip of the calipers. Patient was advised to look 180 degrees away from the injection site. For example, if injecting the right eye in the superotemporal quadrant, the patient was advised to look down and to the left or vice versa.

The injection syringe was then held in dominant hand of the operating surgeon, and a sterile cotton tipped bud in the non-dominant hand. Patient was asked not to talk during the IVT injection. Using the dominant hand, surgeon’s wrist was held on the patient’s cheek for hand stabilization. The 30G needle was inserted for its half length at the marked site in a smooth and single motion, aiming for the mid-vitreous cavity. The plunger of the syringe was then pushed down in a smooth fashion so as to inject the required medicine into the core vitreous. Special care was taken not to move the needle whilst inside the eye so as to avoid any traction on the vitreous.

Once the drug was completely injected, the needle was moved out and the injection site was pressed with the cotton tipped bud to avoid any oozing of the drug. Moxifloxacin eye drops were instilled into the conjunctival sac at the end of the procedure.

After the IVT injection had been administered, each patient was asked about the intensity of ocular pain and discomfort experienced during the procedure. A grading scale based on pain score called Visual Analog Scale (VAS) was used to evaluate the subjective pain experienced by the patients i.e. pain Score 0= No pain; Pain score 1-4 = Mild pain; Pain Score 5-8 =Moderate pain; Pain score 9-12 = Severe pain. Computer software SPSS (version 10) was used to analyze the data.
Proparacaine as a Topical Anaesthetic for Intravitreal (IVT) injections.

DISCUSSION

IVT therapy represents an efficient and common means of delivering therapeutics to the posterior segment of the eye and the use of anti-VEGF agents in this context has revolutionized the treatment of many diseases including ME secondary to DR and RVO1-5. Until the free availability of sustained release IVT pharmacologic agents e.g. Dexamethasone (OZURDEX) / fluocinolone (ILUVIEN/RETISERT) implants, the patients will require ongoing treatment with monthly IVT injections of anti-VEGF agents.12-13,14 For this reason, an ocular anesthetic technique that minimizes patient discomfort and risk of complications is important to consider when using IVT agents. The primary goal of anesthesia during IVT injection should be to increase the patient comfort and compliance by producing aki-nnesia and preventing involuntary lid closure during the needle insertion15-18.

Many approaches to ocular surface anesthesia have been reported including topical drops, anesthetic-soaked applicators, gels, and SC/retrobulbar injection of anesthetics with a number of recent reports comparing the patient comfort during IVT injection with topical anesthesia alone versus SC or peribulbar anesthesia. When 0.5% proxymetacaine plus an anesthetic-soaked cotton tip held to the eye for 30 seconds was compared to SC 2% lidocaine, Cintra et al found no significant difference in patient pain scores for both the IVT injection.3 Kaderli and Avci also compared topical anesthetic to SC 4% lidocaine and while there was a significantly lower pain score during the IVT injection in the SC group, the overall procedure pain scores were similar.13 Kozak et al and Friedman et al each compared topical lidocaine gel and SC lidocaine.5 Both studies found no significant difference in pain between the groups and concluded that topical lidocaine gel was superior.

Previous studies related to anesthetic injection have documented numerous complications, although the rate of occurrence is very low. Complications due to needle injection can even be vision-threatening. These complications include SC hemorrhage, chemosis, conjunctival injection holes and globe perforation.12-18

In a study, Blaha and coworkers found no significant difference between topical 0.5% tetracaine, 0.5% proparacaine, 4% lidocaine-soaked pledget and SC 2%
lidocaine with each patient experiencing each method in four randomized sequential treatments. Each of the previous authors noted a significant increase in SC hemorrhage in the SC lidocaine group.

In a review of the literature, Yau and associates concluded that topical anesthetics were the preferred method for pain relief during IVT injection procedures. In their own comparison of topical entities, they found no significant difference between 4% tetracaine, 4% tetracaine with a lidocaine-soaked cotton swab held to the eye for 10 seconds and 4% cocaine.

This is the first study to our knowledge in which efficacy of proparacaine as a topical anesthetic has been directly tested during IVT injections. We applied this form of anesthesia during IVT injection administration in an attempt to shorten the duration of the surgical procedure and to avoid the complications related to the SC and peri/retrobulbar anesthesia.

In our study, topical proparacaine was effective in providing optimal anesthesia during IVT injections. The pain perceived by our patients was low, leading to short duration of surgery. Furthermore, topical proparacaine 0.5% solution had no particular toxicity on the ocular surface. A randomized study will be needed in future to confirm the results of our study which was a prospective non comparative study.

We think that the ophthalmologists may better be able to prevent any of the probable complications associated with needle injection for anesthesia by using topical proparacaine eye drops as an anesthetic agent. Due to its easy application and optimum anaesthetic effect, this method of anesthesia is a good choice for minor eye surgeries including IVT injections.

CONCLUSION

Through the results of our study, we conclude that 0.5% proparacaine is an effective and safe anesthetic for IVT injection delivery. This anesthetic agent is particularly useful in patients who have distressing fears of injections and in cases where poor co-operation renders the patient vulnerable to needle-related injuries.

REFERENCES:

ABSTRACT

Objectives: (1) To determine the parental understanding of amblyopia by assessing their knowledge and behavior. (2) To study their compliance and the factors pertaining to amblyopic therapy at home.

Patients and Methods: Type of Study: Cross-sectional study.
Sampling Technique: Convenient sampling.
Sample Size: 30 patients
Duration of Study: 4 months.
Setting: Study was conducted at Ophthalmology Department of Bahawal Victoria Hospital, Bahawalpur.
Results: The study revealed the compliance to be 60% in most of the families and there was no effect on compliance except the patching hours and resultant visual acuity. Factors involved are the age of the child, refractive errors, type of patch, actual patching hours observed by the parents at home and the resistance of child affecting amblyopic eye (p=0.171) including duration of the first patch. There were various other factors that are responsible for failure of treatment and a great hurdle in progression of vision or non-compliance of parents in amblyopic therapy.

Conclusions: Poor compliance to patching is the major factor in treatment of amblyopia:

Parental knowledge, attitude and insight are very necessary for the successful amblyopic therapy. 2) Education of parents, understanding of amblyopic therapy, especially the busy schedule of working parents. 3) Proper techniques should be advised that ensure the use of patching at home.

INTRODUCTION

Amblyopia is a state of poor vision during early age of life due to one or more known factors, such as strabismus, anisometropia, high refractive error, and cataract. The result is the functional impairment of the visual cortex, bilateral but mostly unilateral, (1) If left untouched it will not resolve itself, leading to increased risk of visual disability. Occluding the good eye with a patch is a highly successful treatment if practiced before the age of 7 years. Complete compliance was a big hurdle to successful amblyopic therapy. Improvement was associated with perfect patching, but it was difficult for many parents to properly follow the treatment regime that was the main cause of treatment failure in amblyopic children. Patching the better eye is the main therapy so that the lazy eye forces itself to see by signaling to the brain, leading to improved vision (2) To improve compliance extra efforts should be undertaken, to avoid as heat, irritation, poor material and design of the patch (3) which are mandatory.

Proper compliance to patching is the major factor in the successful treatment of amblyopia which is strongly related to parental knowledge, their attitude, regularity to patching and punctuality of consultation, especially for the working parents. Proper techniques is also very important which ensure the use of correct patching at home.

Many studies have reported the negative impact of amblyopia on a child’s life is very important. It can hamper the studies in school, sports and in later professional life. It causes psychosocial difficulty that can affect child’s personality development. Patients with amblyopia suffers from depression and anxiety. (3) Parents are mostly worried and end up in stopping the follow up treatment when they observe that there is no
improvement in the visual acuity. Parents are always in need of modifying the patching and are mostly reluctant to accept their behavior as good parents. In a hospital-based study it was seen that time of occlusion therapy to achieve good acuity was 7.2 months with an occlusion time of 6-7 h/day. The basic aim of this study was to find out the level of emotional stress the child and parents go through and what were the common problems that parents face during carrying out this therapy at home. Mostly, it included the behavior of child and the reaction of child when he/she had her good eye occluded. What is the most preference of child about patch in which he/she feels comfortable.

Major and significant key factor that leads to failure in the treatment of amblyopia is non-concordance. When study was carried out in different areas it was found that parental understanding was very poor in many cases mostly during the critical period of age. The main aim of our studies was to increase the parent’s knowledge about amblyopia and the importance of occlusion with proper guidance and follow ups. Occurrence of amblyopia was three times higher in the population that is left unscreened as compared to the screened population. The compliance rate should be checked over the course of period which could help in assessing the average time required for improvement.

PATIENTS AND METHODS

Data were conducted by cross-sectional study that included 30 families with a child diagnosed with unilateral amblyopia (age range 2-15 years) undergoing patching therapy from one month or above and coming for follow up at Bahawal Victoria Hospital, Bahawalpur. This study was approved by hospital’s research ethical committee.

Inclusion Criteria: Children who were undergoing patching therapy for unilateral amblyopia from 1 month or above. All types of amblyopia were included. Children from 2 to 15 years’ age undergoing patching therapy were studied.

Exclusion Criteria: Children above age 15 years. Any other ocular pathology resulting in decreased vision. Fresh cases of amblyopia.

RESULTS

Test results showed that (60%) children were using frosted lens on good eye and (12%) were using a patch on the amblyopic eye. The percentage of frosted lens was highest because it is preferred by doctors, parents and children due to its easy handling. Children using cotton patch often broke the glasses, hence the parents preferred frosted lens on good eye. 60% showed good improvement in visual acuity upto 6/9. 30% children had visual acuities up to (6/12) or better and 10% had not much improvement and remained up to 6/60 to 6/36. Parental understanding about the condition of amblyopia showed that out of 30 parents, 40% showed good knowledge of amblyopia had considerable improvement, while 40% showed partial understanding and 20% showed poor knowledge.

It was also observed that 40% parents detect amblyopia on regular visits to the eye care professional for routine complaints like watering of the eyes, refractive errors, allergic or infective conditions etc., etc. 20% of parents had a feedback from school teachers that children had difficulty to see and follow their lessons in the class room while sitting on back benches, mistakes were found in their work with considerable lack of interest in their studies. 10% parents were referred to the ophthalmologist from the school visual screening program. 30% children had other causes for the detection of amblyopia that included congenital cataract, or aphakia, squint with frequent closure of one eye.

When attitude of parents towards patching and follow ups were noted, it showed 50% compliance was and they came for checkup on the scheduled appointment. 50% were those who could not come due to various reasons like loss of prescription, jobs of parents, non serious behavior toward patching. It was also observed that mostly doctors advise 4 to 6 hours of patching per week for unilateral amblyopia. Half of the families were advised 4 hours of patching while other half were advised 6 hours. 50% of the parents (15/30) were following only 3 hours of patching while 20% (6/30) were doing 4 hours and 30% (9/30) were following 6 hours. These differences in actual patching hours leads to treatment failure but 60% parents were satisfied by their patching therapy at home. When compliance rate was low there was no significant improvement in vision. This showed that most parents were reluctant to defend their behavior as good parents. The results show that 27 % agreed that the child was very resistant to wear the patch. In fact, it was a major factor affecting the compliance to therapy. High resistance depends on the younger age of the child, type of patch, level of visual acuity, poor handling by parents. Only 10% families neglected due to child’s resistance. The grown up children had more understanding towards therapy.

Our study revealed some level of depressive psychosis amongst 70% (21/30) parents whose children were undergoing patching therapy. They were worried about child’s vision, overall health and future career. 20% (6/30) had high level of depression yet they showed confidence in their doctor and his advices. Factors responsible for poor compliance in this study were age of the child, visual acuity at the time of first examination, patching hours as advised by the doctor, actual patching hours observed at home, resistance of child to patching. More significant results can be achieved if a large sample size is taken and large gaps are filled. It was concluded that only knowledge about amblyopia cannot increase the compliance rate, proper techniques should be advised that ensure the use of patching at home. Merely educating the parent cannot help in improvement of compliance.
Table-1 Percentage wise distribution of parental understanding about the definition of amblyopia

<table>
<thead>
<tr>
<th>Parental understanding</th>
<th>Frequency</th>
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<tr>
<td>Partial</td>
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<tr>
<td>Poor</td>
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</tr>
<tr>
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Table-2 Percentage wise distribution of knowledge about type of amblyopia.

<table>
<thead>
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</tr>
</thead>
<tbody>
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<td>30</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-3A. Advised patching hours

<table>
<thead>
<tr>
<th>Advised patching hours</th>
<th>Frequency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-3B. Patching hours followed by parents at home.

<table>
<thead>
<tr>
<th>Parental understanding</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-4 Percentage wise distribution of reasons of changing the patch.

<table>
<thead>
<tr>
<th>Reason to change patch</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken spectacle</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Damage to cloth patch</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Scratch on spectacle</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>No change</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

DISCUSSION

It is also very important for the ophthalmologist to attain the trust of the parents. Frequent follow ups are compulsory as the treatment entails a longer duration with practice. Occluding the good eye with a patch is a highly effective treatment but compliance is a major problem. Different electronic searches were carried out in June 2014 and updated in April 2015 to identify studies to increase patching compliance. Data screening, extraction and quality ratings were performed by two researchers independently as a result nine papers were included. Interventions including an educational element significantly increased patching compliance. Meta-analysis was carried out on four studies that indicated the interventions involving an educational element have a significant small effect r=0.249, p<0.001. High quality research is needed to further assess the usefulness of specific elements of educational interventions and extra behaviour change technique. Early diagnosis of strabismus along with school screening programs at the age of 4 to detect amblyopia is very important for effective treatment. The major factor in treatment failure was lack of continuity to the treatment and low compliance is linked with social denial and many cultural restrictions as collected from the parents. These boundaries depend upon the methods used in the therapy and the time duration of therapy. Low education and poor visual acuity at initial stages of treatment are important factors. Major and significant key is non-concordance. When study was carried out in different areas it was found that parental understanding was very poor in many cases mostly during the critical period of age. The main aim of our studies was to increase the parent’s knowledge about amblyopia and the importance of occlusion with proper guidance and follow ups.

Occurrence of amblyopia was three times higher in the population that is left unscreened as compared to the screened population. The compliance rate should be checked over the course of period which could help in assessing the average time required for improvement. The sample consisted of 30 children undergoing patch therapy for unilateral amblyopia from age 2-15 years. The highest range included 3-6 years with percentage of 60% (18/30), followed by 7-10 years 20% (6/30) and 11-15 including 20% (6/30). According to Carlton and Kaltenthaler 5% of the population was affected by this problem. It means that quality of life was directly linked to the way how parents carried out the treatment at home apart from the severity of vision, age, clinical condition, impact on family life, social relations, difficulties being faced in daily life and behavior of the child before, during and after the treatment. It was also observed that highest range of age fell between 3-6 years (80%) followed by 7-10 years 3/30 (10%) and 11-15, 3/30 (10%). 18/30 (60%) in children using fogging glasses and 12/30 (40%) were using cotton cloth patch. The percentage of fogging glasses is highest because it is preferred by doctor, parents and the child due to its easy handling. Children using cotton patch often broke the glasses, hence the parents preferred cloth patches over glasses.

Out of 30 parents it was seen that 40% showed good knowledge of amblyopia, 40% showed partial understanding and 20% showed poor knowledge. All these parents emphasized no concern to the problem as if they pretend to have good knowledge of amblyopia. Al-Yahiya suggested ways and methods to overcome the problems that parents or child face during the treatment. They conducted a cross-sectional, retrospective study of 37 families with unilateral amblyopia (age range 3–16 years). The basic aim was to seek informa-
tion with regard to four domains. i) Knowledge, ii) attitude, iii) insight and iv) community spport. Majority of parents fully acknowledged the importance of patching for their child as observed by Louden\(^{(8)}\) suggested that low compliance is found to be associated with social deprivation and low attendance rates. 80\% (24/30) families believed complete recovery from amblyopia if patching therapy is strictly observed. 10\% (3/30) families had shown no interest in the treatment as both parents were working professionals and had little time to follow the doctor’s advice. 10\% (3/30) parents had no idea regarding the importance of patching which is mostly due to lack of education, failure to follow up and in some cases lack of proper counseling by the doctor.

Children prefer glasses more than cloth as it is easy to handle, do not cause irritation and gives better results. But frequency of removing the patch was also noted as the children are mostly careless and glasses are broken easily. 9\% of parents told that they do not change the patch even in non-serious attitude towards therapy. Children mostly get irritated by the fact that they have to wear something unbearable to the eye.

According to Al-Zuhaibi\(^{(10)}\) it was necessary to have a good compliance otherwise it was the big hurdle that leads to treatment failure and ultimately improvement of vision. It was observed that only 14 (45\%) patients showed good compliance to the occlusion therapy in his cases. 17 (55\%) patients were noncompliant and improvement in visual acuity was strongly inter-related with compliance to patching.

**CONCLUSION:**
Poor compliance to patching is the major factor in treatment of amblyopia: Parental knowledge, attitude and insight are very necessary for the successful amblyopic therapy. 2) Education of parents, understanding of amblyopic therapy especially with the busy schedule of working parents. 3) Proper techniques should be advised that ensure the use of patching at home.

**REFERENCES**

Evaluation of Factors Responsible for Significant Spectacles Discomfort


ABSTRACT
Objectives: The objectives of the study is to find the factors that cause the significant discomforts with the spectacles making them intolerable for the patients.

Material & Methods: This is a cross sectional study that consists of 50 patients (50 pairs of spectacle) who came to the O.P.D of Madina Teaching Hospital with the complaints of their existing spectacles. The significant discomforts were noted in the questionnaire along with the responsible factors that were either spectacles or patient related. Spectacles were checked for power versus prescription (Digital Topcon Lensometer Supore LM-8), centration (Prentice Rule), type (Digital Topcon Lensometer Supore LM-8) and frame fit. The current refractive status of the patient was initially measured by a digital autorefractor Nidek ARK-510A and then confirmed by subjective refraction and compared with the spectacles. The patients were also asked about their wearing time, instructions given about spectacles care from service provider and their proper follow up.

Results: A total of 50 patients, 30 patients had blurred vision with their existing spectacles, 11 had headache, 6 complained about eyestrain with their spectacles, 2 had spectacle fitting problem and only 1 had diplopia. The factors found causing these problems were; inaccurate spectacles prescription 26%, wrong spectacles power 24%, decentration 6%, improper fit 8%, no cleanliness 2% and 34% problems were due to no proper follow up of the patients. The results found to be significant (p value < 0.01) using correlation coefficient (SPSS) version 20.

Conclusion: It was concluded that the significant discomfort with the spectacles occurred due to inaccurate prescription of the refractive error correction, inaccurate dispensing of the spectacles, lack of the doctor-patient communication and improper follow up of the patients. However, age, gender, occupation, routine use of the spectacles and spectacles types were not associated with the significant spectacles discomfort.

Key Words: Refractive Errors, Optical Correction, Spectacles Discomforts

INTRODUCTION

Ametropia or refractive errors are the ocular disorders that are very common throughout the world1. In ametropia, the distorted image of an object is formed2. While the emmetropia is the ideal refractive state of the eye in which the parallel rays of the light from a distant object are accurately focused on the retina to form a sharp, clear image of the object. Refractive errors are the optical aberrations that are of two types; monochromatic and chromatic. Chromatic aberrations are caused by the dispersion in which the variation of the refractive index of any component of the optical media occurs with the wavelength of the light that disperses into colors when it passes through such an optical media. Thus the image formed is not sharp and clear but the colored halos are seen around it. These aberrations are absent when the monochromatic light is used. While monochromatic aberrations are caused by the geometry of the lens and occur both when the light is either refracted or reflected. They appear even when monochromatic light is used, hence the name.

Significant spectacles discomforts are headache, eyestrain, diplopia, blurred vision due to improper follow up from heavily burdened centres or improper dispensing of spectacles by mostly untrained opticians. Patients are usually unaware of importance of their spectacles care and their usage due to lack of doctor-patient communication.

Monochromatic aberrations are addressed as higher order aberrations or lower order aberrations. A higher-order aberration is a distortion acquired by the wave front of the light. These aberrations (coma, trefoil and...
spherical aberrations) occur when the light passes through an eye that has irregularities of the refractive index in its optical components i.e., tear film, cornea, aqueous humor, crystalline lens and vitreous humor. Any of the higher order aberrations are not correctable with the simple sphere or cylindrical lenses. Lower order aberrations (hyperopia, myopia, regular astigmatism and presbyopia) are correctable with the spherical, cylindrical and spherocylindrical lenses

It is reported that almost 8 million to 2.3 billion people are being affected from the refractive errors worldwide. Uncorrected refractive errors lead to the visual impairment, 153 million people are visually impaired due to the uncorrected refractive errors. Refraction is the process that evaluates the refractive status of the eye by determining the focusing power of its optical system. It is done either subjectively or objectively. Subjective refraction depends on the patient’s response based on the trial and error method using phoropter or trial frame with the trial box. While objective technique uses retinoscope or autorefractor without receiving any feedback from the patient to measure the refractive status of the eye.

Refraction is the process more than just measurement of the refractive error. It’s goal is to give the simplest system that satisfies the individual patient’s visual needs. Refractive errors are usually corrected with the eyeglasses or contact lenses, or they may be permanently corrected with refractive surgeries. Mode of correction depends on, patient’s visual needs, age, occupation and type and severity of refractive errors etc. Eye care provider and the patient can discuss the best way to correct refractive error.

A contact lens is an optical device of a thin plastic material that is placed directly on the surface of the eye (cornea) to correct the visual defects. Several different types of refractive surgeries have been devised to correct refractive errors by modifying the curvature of the cornea (Refractive Keratoplasty and Photorefractive Keratectomy) or by changing the intrinsic refractive status of the eye by implanting IOL or removing the natural lens. Optical correction for refractive errors fitted in frame constitutes spectacles. Spectacles are a safe mode to provide optical correction as compared to contact lenses and refractive surgeries as they directly contact with the ocular surface and may lead to complications. Spectacles are also inexpensive and most commonly prescribed method for the refractive error correction. Eyeglasses compensate for the refractive error i.e. myopia, hyperopia, astigmatism, presbyopia, phoria or tropia of the patients enabling them to see more clearly at distant, near and at both prescribed by an Optometrist or Ophthalmologist. In U.S.A, 75% people wear some type of refractive correction i.e., 64% spectacles wearers and 11% contact lens users, it suggest the spectacles as best option for refractive error correction. But comfortable vision is achievable with the spectacles if they are made perfectly by the manufacturer, prescribed accurately by eye doctor, dispensed and fitted properly by the optician and kept and used carefully by their users. Otherwise, they may cause visual discomforts e.g., headache, diplopia, sliding down of glasses, eyestrain, blurred vision etc.

The aim of the study is to evaluate the factors that make the spectacles significantly intolerable for their wearers.

MATERIAL AND METHODS

A sample of 50 patients was randomly selected from the eye OPD of the Medina Teaching Hospital, Faisalabad. The subjects included were those who visit the eye department for their eye examination with the complaints of their existing spectacles. A questionnaire was used to record the information about the patient’s name, age, gender, occupation, address and complaints with their existing spectacles along with the other required information i.e, spectacle’s type and their power vs prescription, centration of the lenses, frame fitting, interpupillary distance (IPD) cleanliness of the lenses, instruction about spectacles care, current refractive status of the patients and their follow up. The spectacles were inspected for their type whether monofocal, bifocal or multifocal. A digital Lensometer Supore LM-8 was used to measure the power of the existing spectacles and to mark the optical centres of the lenses. The power of the spectacles was compared with the prescription of the spectacles and this information was noted as spectacles power whether correct or incorrect. The centration of the spectacles was noted and in case of decentration; a simple ruler calibrated into milli-meters was used to measure the difference and the induced astigmatism was calculated by applying the Prentice’s rule. These findings were used to mark the spectacles whether centred or decentred. A digital autorefractor Nidek ARK-510A was used to find out the current refractive status of the patients and their refraction was finalized subjectively. The comparison was made between the current and previous spectacles prescription and this was recorded as accurate or inaccurate on the performa. The patients were asked about the frame fitting; whether they were too tight, too loose, slide down in any position or stay comfortably on their faces. Spectacle fitting was noted as proper or improper. Eyeglasses were also checked for cleanliness and the patients were also asked about any instruction that they received from their eye care provider about spectacles care and follow up.

The data were compiled and analyzed to evaluate the significant spectacles discomforts and responsible factors for it. SPSS Software version 20.0 for window 7 was used to assemble and analyze the results using frequency tables and graphs, co-relation co efficient and chi-square tests.

RESULTS

The study included a total of 50 patients. The mean age of the patients was 34.4 years and the male participants were 21 (42%) while the female participants were 29 (58%). A total of 50, the students were 16 (32%),
computer operator 4 (8%), housewife 10 (20%) and patients related to other professions e.g, teaching, tailoring etc. were 20 (40%) (Table 1).

Table 2. represents the significant discomfort observed with the spectacles that were blurred vision, headache, eyestrain, diplopia, dissatisfaction with spectacles design and sliding down of spectacles. Table shows that the most common significant discomfort occurred with the spectacles was blurred vision 30 cases (60%), then headache 11 cases (22%), eyestrain 6 cases (12%), others including spectacles slide down were 2 cases (4%) and the diplopia was very rarely found, only 1 case (2%).

The factors identified to cause significant spectacles discomfort were: inaccurate prescription of refractive error correction, spectacles dispensed of wrong power as the non-tolerable difference was found between spectacles prescription and the power of the spectacles dispensed, improper fitting of spectacles, decentred lenses of spectacles, dirty and scratched spectacles and no proper follow up after first refractive error prescription. Table 3. shows that most of the subjects (17) who revisit for eye examination after obtaining prescription for refractive error correction were those who were using spectacles for long duration at least more than one year because they were not
Evaluation of Factors Responsible for Significant Spectacles Discomfort

Graph.1 Factors in percentages contributing for significant discomforts
This graph clearly shows the percentage of the significant discomforts as well as the percentage of each and every factors responsible for causing a significant discomfort.

Informed for proper follow up after first prescription followed by inaccurate prescription (13), wrong power of spectacles dispensed (12), improper fit (2), decentred spectacles (3) and scratched and dirty spectacles (1).

The most common discomforts with these factors were blurred vision (60%) and factors responsible for this were: inaccurate prescription (26%), wrong spectacles power (22%), decentration (6%) and improper fit of spectacles (6%). The second most common discomfort was headache (22%) and factors responsible for it were: no follow up (18%), wrong spectacles power (2%) and dirty spectacles (2%). Third prevalent factor was eyestrain (12%) and its contributing factor was only ‘no follow up’. Other discomforts including sliding down of spectacles and misalignment of spectacles were very less (4%) and the only factor contributed to these discomforts was ‘no follow up’. Diplopia was found to be very rare and caused by improper fitting of the spectacle.

DISCUSSION

Spectacle intolerance was one of the reasons that caused poor compliance. Which lead to significant visual discomfort. This study focused to find out the factors that make the spectacles significantly intolerable. The results found in our study were in line with the results of the study done by Kothari et al., in which it was concluded that the quality of the spectacle dispensing was poor that could be improved by more education of optician and patient. The suggestion of that study were to recheck the spectacle for ideal fitting and quality criteria to ensure optimum lens and frame dispensing when a patient came back with the problems of their newly dispensed spectacles. It was concluded in this study that inaccurate spectacle prescription was one of the factor responsible for causing significantly blurred vision in 26% of the patients. The mean differences in spherical, cylindrical and axis degree were; 0.67 DS, 0.67 DC and 4.1 degrees respectively. These results were also found to be similar with the value changes in the study of Freeman and Evans who stated that non-tolerable spectacle prescription was a small but important reaction in the eye clinics but this error could be resolved by small changes within the range of 0.5DS.

Three spectacle pair (6 lenses) found to be decentred with mean deviation of 4.8mm and mean induced prism of 1.14PD. Optical decentration always worse image quality, it’s acceptable only in fractions. One of the patient had dirty and scratched lenses that caused him to suffer with headache. The patient was not informed by the doctor to keep his spectacles clean and its importance. So it happened due to lack of doctor-patient communication as in the study of Fong Ha et al., who said that most of the patient complaints and discontent were due to unstable doctor-patient relationship. Poor frame fitting found in 4 causes that caused blurred vision in three cases and diplopia in one case as vertex distance could not be maintained whenever the improperly fitted glasses slide down or not stay stable in any position while wearing them. Obviously, it was the fault of the optician due to insufficient education and training. It was also mentioned in a study by Kozol et al., that correct spectacle fitting was key to success of ophthalmic spectacle
prescription in addition to accurate refraction. No follow up after receiving first spectacle prescription found to be a factor that contributed to 34% of the patients suffering from headache, eyestrain and using misaligned spectacles. Mean duration of no follow up calculated to be 2.29 years excluding one case who was using same glasses for 25 years because extreme values affect the average value adversely. This was also happened due to high rate of lack of doctor patient communication because 15 patient did not receive any instruction about follow up on receiving their first prescription from their doctor. But two of them were told for recheck-up but they just missed due to their negligence. Long duration of no follow up obviously may change refractive status due to any reason and spectacles may also get improper form. Another factor that affected 24% patients was dispensing glasses with wrong power. The mean differences between the spectacle prescription and the power of dispensed spectacles were; 0.443DS, 0.161 DC and 24.6 degrees in spherical, cylindrical and axis degrees respectively. Obviously, it was also resulted due to poorly trained and qualified optician. No previous study was found related to discuss these factors.

CONCLUSIONS

Significant spectacles discomfort found in the study were; headache, eyestrain, diplopia, blurred vision and unstable eyeglasses. The factors found to be responsible for significant discomforts were; improper follow up after obtaining first prescription for refractive error correction because they were not told by their eye care provider for re-checkup, inaccurate prescription of refractive error correction due to not following proper protocol because of heavily burdened centre, improper dispensing of spectacles just because insufficient opticians and patients were unaware of importance of their spectacles care and their usage because of lack of doctor-patient communication.

Recommendations: 1. whenever the patient presents with the problems of his/her spectacles, it is necessary to check the centration of the lenses, fitting of the spectacles, frame fitting, status of lenses whether clear or scratched and spectacles power vs prescription in addition to just repeating the refraction.

2. The patient should receive proper protocol for satisfactory spectacles prescription despite of heavily burdened eye care centres.

3. It’s the responsibility of the eye care provider to educate the patient about significance of proper spectacles use, their care and proper follow up.

4. Optician should be qualified and properly trained to provide satisfactory services of optical dispensing.

5. By accurate refraction and properly dispensed spectacles, will save the patients from unnecessary financial burden, wastage of time especially the unaffording patients and repeated visual consultations.

REFERENCES


Activities of Daily Living (ADL) in Patients Undergoing Laser Photocoagulation for High Risk PDR.

Hafsa Malik.MBBS.,¹. Imran Saleem Channar. FCPS.²

ABSTRACT

Purpose: To evaluate the effect of PRP on ADL in patients having PDR.

Material and Methods: 30 patients (13 Males, 17 Females) with PDR and undergoing PRP were included in this study. Visual Function Questionnaire (VFQ-25) developed by the National Eye Institute (NEI) of America, was used to evaluate the ADL before and after PRP. The VFQ-25 was filled in by the authors before and at 6 months after the completion of PRP in order to compare any changes in ADL. The pre and post treatment VFQ-25 scores were compared using paired t-test.

Results: Mean VFQ-25 composite score before PRP was 74.79 ± 15.7 and after PRP it was 74.08 ± 19.1 (p = 0.875). The difference between pre and post PRP VFQ-25 composite scores was not statistically significant.

Conclusion: PRP treatment has insignificant detrimental effect on activities of daily life in patients having PDR.

Keywords: Panretinal photocoagulation(PR), Proliferative diabetic retinopathy (PDR), Visual function Questionnaire.(VFQ)

INTRODUCTION

PRP, first performed by Meyer-Schwickerath [1], still remains an effective treatment for PDR. The beneficial effects of PRP for diabetic retinopathy and its effectiveness in decreasing the incidence of blindness were established almost 20 years ago by a multicentre study, the Diabetic Retinopathy Study (DRS).

Both DRS and the Early Treatment Diabetic Retinopathy Study (ETDRS) provided data to establish the guidelines for detection and effective treatment of PDR. While the DRS findings demonstrated that PRP reduces the risk of severe visual loss in patients with high-risk PDR by 50-60%, ETDRS reported the effectiveness of using photocoagulation to treat PDR and recommended that documented PRP should be initiated early to be most effective in the management of PDR [2,3].

While the exact mechanism for how PRP achieves its therapeutic effect is an area of active investigation, one theory as to mechanism of laser treatment is that it reduces neo-vascular disease by killing retinal cells in the poorly perfused portions of the retina, reducing relative ischemia, thus decreasing the production of angiogenic factors and increasing oxygenation of the viable retina [3-11]. Since photoreceptors are the most metabolically active and numerous cells in the retina, PRP for PDR involves the purposeful destruction of a fraction of the photoreceptors. Laser therapy is typically titrated to a visible clinical effect (graying or whitening of the retina), which corresponds to necrosis of the photoreceptors, and at higher settings, to the inner retina.

Although clinically highly effective at halting angiogenesis, PRP can lead to untoward side effects. Systematic clinic-pathological analysis of laser-induced retinal lesions over time has demonstrated that longer exposure time and higher intensity typically produce retinal lesions that affect not only RPE and photoreceptors, but also the inner nuclear layer (INL), ganglion cell layer (GCL), and nerve fiber layer (NFL).

Patients with PDR, PRP treatment have no significant detrimental effect on vision related quality of life as measured through VFQ-25. In order to understand the mechanism by which PRP reduces the risk of severe visual loss in patients with PDR, it is important to regularly follow any changes in VFQ-25 scores.

This phenomenon can lead to complications including significant patient discomfort during laser application, permanent retinal scarring, and decreased color, and night vision. Nerve fiber and visual field defects can result from the laser lesions that affect the inner retina. Constricted visual field, defective hue discrimination, increased glare and reduced contrast sensitivity have been reported in previous studies [4,7,12-20]. The impact of above mentioned complications on patient's daily visual functioning and quality of life has not been much studied in the past. The purpose of our study was to: i) Compare the pre and post-laser ADL (VFQ-25) in patients about to undergo PRP treatment for PDR. ii) Analyze the impact of PRP on patient-reported daily visual functioning.

MATERIAL AND METHODS.

Study settings: This study was performed at the department of ophthalmology, B. V. Hospital, Bahawalpur, from September 2016 to February 2017. Before commencement of the study, written permission was taken from the ethical committee of the hospital. 30 patients (13 Males, 17 Females) having PDR and undergoing PRP were included in this study. The study was conducted in accordance with the tenets of the Declaration of Helsinki. All the participants gave written informed consent. Data collected from the
patients included a thorough history including the age, gender, duration and age at onset of diabetes mellitus, presence or absence of hypertension, body mass index, use of insulin or oral hypoglycemic agents, presence of other systemic diabetic complications and other general illnesses.

Ocular parameters were assessed at baseline by recording the best-corrected visual acuity (BCVA) using Snellen’s chart, the BCVA thus obtained was then converted to logMAR acuity by using online Snellen’s to logMAR converter \[^8\]. Intraocular pressure (IOP), slit-lamp examination, retinal examination, stereo colour fundus photographs and fundus fluorescein angiography (FFA). Intraocular pressure was recorded with the Goldman applanation tonometer. Slit lamp examination details including the presence or absence of cataract was documented. Nuclear sclerosis was graded from +1 (mild) to +4 (very dense). Cortical and posterior sub-capsular cataracts were each given an additional score of +1.

Detailed fundus examination was performed by the authors using slit-lamp biomicroscopy with 90 D lens. Colored fundus photographs were taken by the authors using the Topcon TRC50-VT (Topcon, Tokyo, Japan) fundus camera. The areas photographed included stereo pictures of the macula, the disc, and the superior-temporal and inferior-temporal retinal quadrants. The location and extent of neo-vascularization were assessed based on clinical examination, colored fundus photographs and FFA pictures. The presence of active neo-vascularisation of disc (NVD), neovascularisation elsewhere (NVE) were recorded.

Treatment of PDR was done according to the guidelines provided in the ETDRS \[^1\]. A complete PRP was performed with frequency doubled Nd: YAG continuous wave laser with wavelength of 532 nanometer. A total number of 2500-3000 burns were delivered using 300-500 microns spot size in two to three sittings. The number of visits and the number of burns needed to complete the initial treatment was also recorded. The need for additional laser treatment was decided by the clinical presentation, which was documented by colored fundus photographs and FFA at 3-6 months follow-up examinations.

ADL of the patients was assessed before and at 6 months after performing the PRP by using the Visual Function Questionnaire-25 (VFQ-25, Version 2000). VFQ-25 is an eye specific questionnaire that reflects the respondent’s self-reported vision related quality of life and ADL in subscales i.e. general health; general vision; ocular pain; near activities; driving; color vision; peripheral vision social functioning; role difficulties; and dependency. The VFQ-25 consists of a base set of 25 vision targeted questions representing 11 vision-related constructs, plus an additional single-item general health rating question. All items in the VFQ-25 are from 51-item field test version; no new items were developed for use in the VFQ-25. The VFQ-25 is available in two formats, the “self administered” format and the “interviewer administered” format. Since most of our patients were uneducated, we chose to use the interviewer administered format. The VFQ-25 takes approximately 10 minutes on average to administer in the interviewer format.

VFQ-25 composite scores achieved by each patient were recorded by the authors before and at 6 months after applying the PRP. The composite scores were calculated in three steps. First, original numeric values from the VFQ-25 survey were recorded as reported by the patients. Each item of VFQ-25 was then converted to a 0-100 scale so that the lowest and highest possible scores were set at 0 and 100 points, respectively. In second step, items within each subscale were averaged together to create the 12 sub-scale scores. Hence, the scores represented the average for all items in the subscale that the respondent answered. To calculate an overall composite score for the VFQ-25, we simply averaged the vision-targeted subscale scores. By averaging the sub-scale scores rather than the individual items we were able to give equal weight to the each sub-scale.

The statistical analysis was performed using IBM SPSS statistics. Paired sample t-test was used to compare the pre and post-laser composite scores. We followed the guidelines of VFQ-25 for calculating the scale conversions and subscale scores with 11 vision-related constructs plus an additional single-item general health question. We calculated the results for our 30 patients according to the VFQ-25 manual. Results were considered statistically significant at p-value < 0.05.

RESULTS.

There were 30 patients who participated in this study. The patient’s age and sex distribution is given in table-I. The mean age of the study group was 53 ± 9.1 years. More than fifty percent of the study subjects were females. The mean duration of diabetes was 14.4 ± 6.4 years in the study group. NVE was observed in 76% and NVD in 34% of the study participants (Table-III). The mean LogMAR BCVA score before PRP treatment was 0.78 ±0.26; post-laser score for BCVA was 0.30 ±0.35 (p=0.0001) as shown in table-II. All the patients had bilateral PRP at baseline. A total of 60 eyes of 30 patients had received PRP during the study period. Thus all the 60 eyes were subjected to analysis.

With VFQ-25, none of the subscale scores had a statistically significant difference between before and after PRP. The pre and post-laser scores were lowest for the subscale of general health (mean ± SD) viz. 35.65 ± 22.04 and 35.00 ± 18.0 respectively. The highest pre and post-laser score was observed for the subscale of dependency (mean ± SD) i.e. 93.48 ± 18.12 and 91.32 ± 11.4 respectively (table-IV).

At 95% CI, the difference between the pre and post-laser subscale scores for the general health and the dependency were not statistically significant (p = 0.9009 and 0.5826 respectively). Pre and post-laser VFQ-25 composite scores (mean ± SD) were 74.79 ± 15.7 and 74.08 ± 19.1 respectively and as can be observed from table-IV, this difference between pre and post PRP composite scores was not statistically significant (p = 0.875).
Activities of Daily Living (ADL) in Patients Undergoing Laser Photocoagulation for High Risk PDR.

DISCUSSION:
In this study, we included patients from outdoor patient department of our own hospital. The patient sample in the present study was relatively small. However, this study provides valuable information about patients offered treatment for PDR in clinical settings.

In most of the VFQ-25 subscales, patients with PDR had pre PRP scores comparable to the post-laser scores. The findings of our study are in line with the findings of some similar studies performed in the recent times [10,11]. Regarding health-related activities of daily life measured using the VFQ-25; we found no significant differences in pre and post-laser scores. This means that PRP has insignificant effect on overall vision related quality of life and the daily visual activities of the patients. This finding in our study is contrary to some of the previous studies in which it was observed that PRP leads to visual field constriction [6,7,12,15,22-25]. Our findings appear to indicate that the diabetic population with PDR in the real-world setting is benefited from the laser treatment.

The most unexpected result in this study was the low scoring on the NEI VFQ-25 subscale for general health—both from a clinical viewpoint and when compared to other similar studies and in studies on patients with glaucoma and patients diagnosed before the age of 30 years [9,10,16,18]. One possible explanation for this finding is that all the patients in our sample had PDR and it is a well known fact that the neo-vascular proliferation in PDR has a substantial negative impact on the vision related quality of life as

<table>
<thead>
<tr>
<th>TABLE-I Patient demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLE</td>
</tr>
<tr>
<td>AGE (YEARS)</td>
</tr>
<tr>
<td>40-50</td>
</tr>
<tr>
<td>51-60</td>
</tr>
<tr>
<td>61-70</td>
</tr>
<tr>
<td>71-80</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE-II Best corrected visual acuity (logmar).</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-LASER BCVA (MEAN ± SD)</td>
</tr>
<tr>
<td>0.78 (±0.26)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE-III Nature of proliferative diabetic retinopathy (PDR).</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDR WITH NEO-VESSELS ELSEWHERE (NVE)</td>
</tr>
<tr>
<td>MALE</td>
</tr>
<tr>
<td>FEMALE</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE-IV VFQ-25 sub-scale and composite scores.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFQ-25 SUBSCALES</td>
</tr>
<tr>
<td>GENERAL HEALTH</td>
</tr>
<tr>
<td>GENERAL VISION</td>
</tr>
<tr>
<td>OCULAR PAIN</td>
</tr>
<tr>
<td>NEAR ACTIVITIES</td>
</tr>
<tr>
<td>DISTANT ACTIVITIES</td>
</tr>
<tr>
<td>SOCIAL FUNCTIONING</td>
</tr>
<tr>
<td>MENTAL HEALTH</td>
</tr>
<tr>
<td>ROLE DIFFICULTY</td>
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<tr>
<td>DEPENDENCY</td>
</tr>
<tr>
<td>DRIVING</td>
</tr>
<tr>
<td>COLOR VISION</td>
</tr>
<tr>
<td>PERIFERAL VISION</td>
</tr>
<tr>
<td>COMPOSITE SCORE</td>
</tr>
</tbody>
</table>
well as the general health of the patients. However, one weakness with this study is the lack of a control group, which does not allow a direct comparison with a comparable patient cohort or sample.

We measured the BCVA using Snellen’s chart and then converted it to LogMAR acuity with the help of an online converter. It is so because LogMAR gives an accurate value, especially if visual acuity is reduced. One disadvantage was that it was more time consuming than acuity testing using the Snellen’s chart. In real-world settings, as was the case in the present study, the LogMAR chart is generally preferable for diagnosis and follow-up of the eyes subject to PRP treatment.

Our study found that patients with diabetes who were going to undergo PRP treatment for visual impairment due to PDR gave a low rating for their general health as measured with the help of VFQ-25 but there was no statistically significant difference in the overall pre and post-laser VFQ-25 (subscale and composite) scores. This study had a relatively small sample size due to the number of patients that received the PRP treatment. But the value of the study, if it is implemented in real-world settings, the results of the study can be generalized for the group of diabetic patients undergoing PRP treatment for sight-threatening PDR.

CONCLUSION,

This study found that in patients having PDR, PRP treatment has no significant detrimental effect on vision related quality of life and activities of daily life as measured through VFQ-25. In order to increase our understanding of the mechanism by which PRP reduces the risk of severe visual loss in patients having PDR, it is important to regularly follow the patient cohorts or samples for any changes in VFQ-25 scores.

REFERENCES:
Location of Retinal Tears in Ocular Trauma

Bilal Khan FCPS 1 Muhammad Idrees FCPS2, Mir Ali Shah FCPS3, Mehfooz Hussain FRCS4

ABSTRACT

Objective: To determine the location of retinal tears in ocular trauma.

Materials & Methods: This cross sectional study was conducted at Eye Department, Lady Reading Hospital, Peshawar from 1st January 2013 to 31st December 2013 with 1 year duration. All patients with ocular trauma with both genders and any age having retinal tear were included in the study while patients with ocular trauma without retinal tears and other ocular diseases were excluded from the study. Patients particulars like name, age, gender, address, history of ocular trauma and retinal tears whether present or absent were documented on pre designed proforma. Data was analyzed by SPSS version 20 and results were represented in the form of graphs and charts.

Results: A total of 105 patients of ocular trauma were included in the study. Male to female ratio was 2.5:1. Average age of the patients was 42.07 years ±SD with range 13-64 years. The retinal tears in ocular trauma was most common at infero-temporal 52(49.52%) followed by supero-nasal 37(35.23%) quadrant.

Conclusion: Retinal tear is common in our setup due to ocular trauma. Middle age males are most suffered from it with infero-temporal quadrant of the eye is most common location.

Key words: Retinal tears, ocular trauma, inferotemporal quadrant

INTRODUCTION

Ophthalmic trauma is a major public health problem. Majority of them are male and under 30 years of age. Open globe injuries are more frequent after violence and occupational injuries which are the major causes of ocular trauma. Ophthalmic trauma comprised 6.78% of the hospital admission.1 The incidence of ocular injuries was first reported by Zander and Geissler, who in 1864, reported it to be between 1.8 % to 9 %. Studies from India and Pakistan showed incidence of 20.3 % and 12.9% respectively.1 Bilateral ocular trauma occurs in 2.9%.2 Ocular injury is significant (5.1%) in the community and causes monocular visual impairment in about one third (34.6%) of cases.3

The vitreous is a clear gel-like substance that fills in the back cavity of the eye which is lined by the retina. At birth, this gel is attached to the retina, but as we age, the gel separates from the retina creating a posterior vitreous detachment or PVD. In most cases, this happens without any issue. However, in people who have an inherently more “sticky” vitreous, as the vitreous separates from the retina, it pulls abnormally (abnormal vitreo-retinal adhesion) and causes the retina to tear.4 Although retinal tears may also occur as a result of eye trauma, most retinal tears occur spontaneously due to a PVD. A patient with an acute retinal tear may experience the sudden onset of black spots in the affected eye. This can have the appearance of someone shaking pepper in your vision. Flashes of light are another common symptom.5,21,22

If there is associated vitreous haemorrhage or retinal detachment, additional symptoms can include blurred vision or a shadow as if curtains are closing in from the peripheral vision. However, in some cases, a retinal tear may not manifest any noticeable symptoms. Risk factors are not required to develop a retinal tear, but they make the likelihood greater.6,23,24 These factors include: advanced age, degree of myopia, associated lattice degeneration, trauma, Family history of retinal tears or detachment, prior eye surgery. There is no way to predict who might develop a retinal tear or when it might occur. A thorough and timely examination by an ophthalmologist using scleral depression and/or a 3-mirror lens is the most important step in diagnosing a retinal tear. In cases where there is a limited view of the retina due to overlying hemorrhage, ophthalmic ultrasound may be required to aid in diagnosing a retinal detachment and sometimes tear.7

Retinal tear is common in our setup due to ocular trauma. Middle age males are the most sufferers while the infero-temporal quadrant is a commonest location.

If a retinal tear is diagnosed promptly before

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it progresses to retinal detachment, the prognosis is extremely good. Retinal tears are typically treated with laser or a freezing procedure. Treatment is performed in an office setting and is very effective and quite safe. Topical or local anesthesia is utilized, and the procedure is only mildly uncomfortable. The treatment creates spot-welding around the edges of the tear that nearly eliminates the risk of the tear progressing to retinal detachment. After a tear has been treated, there remains a future risk of developing additional, separate retinal tears; therefore, continued monitoring is important. Not all retinal tears require treatment. When low-risk tears are identified in patients who have no symptoms, these tears can be observed without treatment. Some tears “treat themselves,” meaning they develop adhesion around the tear without treatment, and these situations can be followed without treatment as well.6,8.

MATERIALS & METHODS.

This cross sectional study was conducted at Eye Department, Lady Reading Hospital, Peshawar from 1st January 2013 to 31 December 2013. All patients with ocular trauma with both genders and any age having retinal tear were included in study while patients with ocular trauma without retinal tears and other ocular diseases were excluded from the study. Patients particulars like name, age, gender, address, history of ocular trauma and retinal tears whether present or absent were documented on pre designed proforma. Data was analyzed by SPSS version 20 and results were represented in the form of graphs and charts.

After taking consent from the ethical research committee of the hospital, the patients who fulfilled the inclusion criteria were admitted in the ward and were evaluated by history, physical examination for ocular trauma, visual acuity by standard Senellen’s visual acuity chart along with best corrected visual acuity using pin hole. Indirect ophthalmoscopy with 20D lens was performed to look for presence or absence of retinal tears and if fundus view was hazy B-scan was performed to look for presence or absence of retinal tears. Exclusion criteria variables were followed strictly to control confounders and bias in the study results.

RESULTS

A total of 105 patients of ocular trauma were included in the study. There were 75 (71.42%) were males and 30 (28.75%) were females. Male to female ratio was 2.5:1(Table no 1). Average age of the patients was 42.07 years± 5SD with range 13-64 years. Patient’s age was divided in four categories, out of which most common age group for ocular trauma was 21-35 years. 13(12.38%) were of the age less than 20 years. 52(49.52%) patients were in the age range of 21-35 years, 23 (21.90%) were of age range 36-50 years and 18(17.14%) presented at age more than 50 years of age. (Table 2). Based on location of retinal tears after ocular trauma the most common location was inferotemporal having 52(49.52%) followed by superonasal 37(35.23%) cases then superotemporal 11(10.47%). (Table : 3)

TABLE NO: 1. Gender wise distribution of the patients

<table>
<thead>
<tr>
<th>Gender of patients</th>
<th>No of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>75</td>
<td>71.42</td>
</tr>
<tr>
<td>Females</td>
<td>30</td>
<td>28.58</td>
</tr>
</tbody>
</table>

TABLE NO: 2 Age wise distribution of the patients

<table>
<thead>
<tr>
<th>Age of the patients</th>
<th>No. Patients</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤20.00</td>
<td>13</td>
<td>12.38</td>
</tr>
<tr>
<td>21.00 - 35.00</td>
<td>52</td>
<td>49.52</td>
</tr>
<tr>
<td>36.00 - 50.00</td>
<td>23</td>
<td>21.90</td>
</tr>
<tr>
<td>51.00+</td>
<td>18</td>
<td>17.14</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>100.00</td>
</tr>
</tbody>
</table>

TABLE NO 3; Location of retinal tears

<table>
<thead>
<tr>
<th>Location of retinal tears</th>
<th>No of patients</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferotemporal</td>
<td>52</td>
<td>49.52</td>
</tr>
<tr>
<td>Supero nasal</td>
<td>37</td>
<td>35.23</td>
</tr>
<tr>
<td>Supero temporal</td>
<td>11</td>
<td>10.47</td>
</tr>
<tr>
<td>Infero nasal</td>
<td>5</td>
<td>4.76</td>
</tr>
</tbody>
</table>

DISCUSSION

Retinal diseases are the major causes of visual impairment in the western countries but may be less important in the developing world where vision loss from preventable causes like cataract and corneal scarring predominate. However, a population-based survey in India indicated that retinal diseases were the primary causes of blindness in a significant percentage of the studied population. In the United States and Europe, population-based surveys on the incidence of retinal tears in developing countries are scarce and little is known about the incidence of retinal tears in Africa.

Trauma is a well recognized cause of retinal tears, which was reported by Eagling to affect 4-6% of such injuries. The characteristics of post contusion retinal tears were described by Cox et al and the mechanism of break formation was elucidated by Delori et al who studied the effect of high speed projectile on enucleated pig eyes. Experimental evidence indicates that retinal breaks form at the time of ocular impact. However, clinical reports show considerable delay in the diagnosis of post traumatic retinal tears. For example, Cox et al reported that only 30% of post-traumatic retinal tears were diagnosed within one month of injury, and Ross...
found 40% in a similar period.

Ocular trauma was the most common etiology for pediatric retinal tears in the initial research for this series, accounting for 25 (42%) of the surgical cases for pediatric retinal detachment at Emory University between 1991 and 1997. Winslow and Tasman noted a similar incidence of retinal tears attributed to trauma (44%) in their review of juvenile retinal tears in 1978. When considered across all age groups, retinal tears occurs following trauma in approximately 11% of cases.\(^{10,12}\)

In our study the mean age at presentation was 42 years ±5 SD with 71.42% of the patients being between 21 and 50 years of age. This is comparable to other studies done by Rosman et al\(^{19}\) in Singapore and Yorston et al\(^{20}\) in East Africa where they found mean ages of 46.1 and 47 years respectively. But in another study done in Croatia by Ivanisevic et al\(^{20}\), the mean age was 58.3 years, which is higher than that of the other studies. The higher mean age in the Croatian study could be justified by the fact that this study (unlike the others three) excluded all traumatic retinal tears cases which actually tend to occur in young adults.

Our study also showed that retinal tears were significantly more common in males 71.42% than in females 28.58%. This finding is also comparable to studies done in East Africa\(^ {13}\) and Singapore \(^ {19}\) where 62.2% and 70% of retinal tears, respectively, manifested in men. One possible explanation for this difference at least in our setup could be that males (for various reasons) have the custom to show up at health care services more often than females do and the second reason is that in our ritual society of KPK, the females are mostly restricted to the homes and health care services more often than females do and the second reason is that in our ritual society of KPK, the females are mostly restricted to the homes and the males are responsible for earning this is why they suffer more from the ocular trauma due to external environmental impact. In our study when patients were evaluated for retinal tears the most common location was inferotemporal followed by superonasal quadrant of the eyes having 52(49.52%) and 37(35.23%) cases. Johnson PB \(^ {25}\) in his study has shown that out of 65 cases of ocular trauma, 28(43.07%) patients were diagnosed as retinal tears at inferotemporal quadrant of the eye which was the most common site. Hence, it is in accordance with our study which has the commonest location of retinal detachment.

**CONCLUSION**

Traumatic injuries are very common in KPK. Ocular trauma mostly affect middle age males and the most common location of retinal tears is inferotemporal

**REFERENCES**


Identification of Correction Factor for Intraocular Pressure Measurement Based on Pachymetry

Anwaar ul Haq Hashmi FCPS 1, Zahid Mahmood, FRCS 2
Prof. M. Arshad Mahmood FCPS, M.Sc (ME)3
Ayesha Azam FCPS, FRCS4, Iftikhar Ahmad FCPS II5. Muhammad Ali., BSN6

University College of Medicine & Dentistry Teaching Hospital, University of Lahore

ABSTRACT
Purpose: To detect the correction factor used in the auto-tonopachy readings, so that this could also be used for Goldman applanation tonometer
Method: A prospective randomized study. The patients with diseased corneas were excluded from the study. There was no gender discrimination. All patients above 15 years of age were included. Along with the complete evaluation, the non-contact tonometer (NCT) with auto pachymetry was done on both eyes of the patients. Pachy, IOP as well corrected IOP were recorded. The adjustment factor used in algorithm of the autotonometer was extracted by deduction of the corrected IOP from the IOP values for each pachymetry reading.
Results: 232 eyes of 116 patients were included in this study. The male: female ratio was 64:52. Mean age was 33.01+-11.9. Median age was 20 years. Minimum was 15 and maximum age was 59 years. CCT mean was 528+-30.144. Median value was 531.5 microns. The NCT mean was 17.16. Median value was 16 mmHg. Mean corrected IOP value was noted as 18.23 mmHg. Median IOP value was 17.45 mmHg.
Conclusion: The pachymetry should be the part and the parcel of a complete ocular examination. More emphasis should be given to the thinner corneas while going for PRK, LASIK as well as when dealing with glaucoma. Goldman applanation (an old is gold ) will remain gold standard if the CCT based correction factor is incorporated.

Keywords: Cct, Iop, Pachy, Gat, Nct

INTRODUCTION:
The cornea is a unique structure, it is transparent and avascular contributing about two third of the total dioptic power of eye. But on the other hand central cornea is used for the instrumental measurement of intraocular pressure. The goldman applanation tonometer has been in use since 1950. Since that time it is a gold standard for iop measurement1. Most of the ophthalmologists rely on the goldman applanation tonometer.

The inventor (goldman h & schmidt) was aware that variation in the corneal thickness could be a source of error in accurate iop measurement.2 Later many studies have been conducted to find the correction factor based on the variation in the cct reading. First such study was conducted by ehlers et al. In 1975 in an attempt to get a correction factor for gat measurement. His study concluded that 7.1 As iop correction factor for each 100 micron change in the cct. There are many other studies to find the iop measurement correction factor and agreed upon the relationship of iop measurement with the corneal thickness, but lower slopes of association, widely ranging between 0.7 And 4.5 Mmhg.4-16

The cct based correction algorithm was based on the ehler’s correction13 for gat and is shown in table 1. This correction algorithm is distributed with most pachymetry instruments and has been used and validated in previous studies14.

The pachymetry should be the part and the parcel of a complete ocular examination. More emphasis should be given to the thinner corneas while going for PRK, LASIK and in glaucoma cases. Goldman applanation will remain the gold standard if the cct based correction factor is incorporated.

Table 1. The modified ehler’s correction factor algorithm.

<table>
<thead>
<tr>
<th>Central corneal thickness (lm)</th>
<th>Correction value (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>10</td>
</tr>
<tr>
<td>415</td>
<td>10</td>
</tr>
<tr>
<td>420</td>
<td>9</td>
</tr>
<tr>
<td>425</td>
<td>9</td>
</tr>
</tbody>
</table>
Identification of Correction Factor for Intraocular Pressure Measurement Based on Pachymetry

Abbreviations: lm = microns, mmhg = millimeter mercury

The non-contact tonometer (nct) is widely used as a screening tool for glaucoma because of its advantage of not requiring direct corneal contact and corneal anesthesia. Previous studies have shown that the nct can produce accurate iop assessment comparable to goldman applanation tonometer (gat)\(^8-10\). The cct readings affect the nct measurements\(^11\). The test–retest variability of nct has already been reported.\(^12\)

The central corneal thickness variation does affect the measurement. The thicker the cornea the higher is iop reading and thinner the cornea lower is the reading. This fact has unraveled the mystery of low tension glaucoma as well as the ocular hypertension. On the other hand, increasing number of the corneal refractive surgeries e.G. Lasik, lasek, prk and cxl, the significance of the pachymetry has increased. Hence no ocular examination is complete without the pachymetry. The pachymetry can be ultrasonic devices as well as optical ones.

### MATERIALS AND MEHTODS:

This study was conducted in the department of ophthalmology, teaching hospital, of university of lahore, during january 2016 to december 2016. This study was prospective and randomized. Complete evaluation was done including patient’s history and examination auto-refractometry using topcon kr-800 auto-refractometer and best corrected vision was recorded. Slit-lamp examination of anterior and posterior segment was done. Cup to disc ratio was also recorded along with patient’s age, gender, refractive errors/state.

The cannon autotonpachy tx -20p full autotonmeter was used to measure the central corneal thickness and uncorrected as well as corrected iop were measured. For each eye three measurements were made and the average one was recorded. All patients who were cooperative and had healthy corneas were selected. Patients with diseased corneas were excluded from the study e.G. Keratitis, scarred corneas as well as patients with nystagmus.

A table of pachymetric readings, iop and adjusted iop was formulated. The change between the iop reading and corrected iop was recorded for each pachy reading and was taken as the correcting / adjusting factor. A table was formulated on the basis the above mentioned findings. It was observed that in this full autoton, the pachy reading of 553 was standard one and thickness less than this reading needed to add the adjusting factor for iop while for the thicker cct needed to deduct the factor!

### RESULTS:

232 Eyes of 116 patients were included in our study. Male to female ratio was 64:52. Cct mean was 528.09\(\pm\) 30.144, Median value was 531.5 Micron, mode was 506, and range was 155 and minimum value was 451 and maximum was 606. Nct mean was 17.163. Median value 16.0 And mode was also 16.0 Mmhg. Range was 46.9. Minimum value was 10.1 While maximum value was noted as 57.0 Mmhg. The mean of the corrected iop values was 18.238 Mmhg, median value was 17.450. Mode was 19.0 And the range was 48.1 Mmhg. Minimum and maximum values were 11.6 And 59.7 Hg respectively.

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>64</td>
<td>55.2</td>
<td>55.2</td>
<td>55.2</td>
</tr>
<tr>
<td>Female</td>
<td>52</td>
<td>44.8</td>
<td>44.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Identification of Correction Factor for Intraocular Pressure Measurement Based on Pachymetry

Mean age was 33.02 ± 11.9. Median age was 32 while mode was 20 with minimum 15 and Maximum age was 59 years.

<table>
<thead>
<tr>
<th>AGE FREQUENCIES ACCORDING TO AGE</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>15-24</td>
<td>34</td>
<td>29.3</td>
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<td>25-34</td>
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<td>18.1</td>
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<td>35-44</td>
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<td>55-64</td>
<td>17</td>
<td>14.7</td>
<td>14.7</td>
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<tr>
<td>Total</td>
<td>116</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table: 2 The correction factors were found to as given in the table.

<table>
<thead>
<tr>
<th>CCT</th>
<th>CORRECTION FACTOR</th>
<th>CCT</th>
<th>CORRECTION FACTOR</th>
<th>CCT</th>
<th>CORRECTION FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>451</td>
<td>+4.9</td>
<td>513</td>
<td>+1.8</td>
<td>554</td>
<td>-0.9</td>
</tr>
<tr>
<td>455</td>
<td>+4.8</td>
<td>514</td>
<td>+1.8</td>
<td>555</td>
<td>-0.1</td>
</tr>
<tr>
<td>467</td>
<td>+3.7</td>
<td>515</td>
<td>+1.7</td>
<td>556</td>
<td>-0.1</td>
</tr>
<tr>
<td>471</td>
<td>+3.7</td>
<td>516</td>
<td>+1.7</td>
<td>558</td>
<td>-0.2</td>
</tr>
<tr>
<td>473</td>
<td>+3.6</td>
<td>518</td>
<td>+1.6</td>
<td>559</td>
<td>-0.2</td>
</tr>
<tr>
<td>474</td>
<td>+3.6</td>
<td>519</td>
<td>+1.6</td>
<td>560</td>
<td>-0.3</td>
</tr>
<tr>
<td>475</td>
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<td>+1.5</td>
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</tr>
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Mean age was 33.02 ± 11.9. Median age was 32 while mode was 20 with minimum 15 and Maximum age was 59 years.
Identification of Correction Factor for Intraocular Pressure Measurement Based on Pachymetry

DISCUSSION:
With rapidly changing world, the advancements in the technologies are making the life faster, easier and more accurate. For example the autorefractometer has largely replaced the manual refraction by streak retinoscope. Similarly the non-contact tonometer with pachymeter is available which instantly gives IOP and pachy reading without topical anesthesia and is becoming popular. But on the other hand, the GAT is the gold standard in IOP measurement till to date and most of the ophthalmologists rely on it and are more confident with the Goldman tonometer. Therefore we decided to extract the correction factor which is not given in the literature.

The fact that the variations in the CCT do affect the IOP measurement. Thicker corneas give higher IOP readings than the thinner corneas. This fact has also unraveled the mystery of ocular hypertension which is related to the increased CCT as well as the normotensive glaucoma and thinner CCT. Pachymetry is becoming the part of a complete ocular examination as its clear requirement in refractive corneal surgery like PRK and LASIK and also in accurate IOP measurement as required for glaucoma diagnosis and management. The pachy also plays an indirect role in the endothelial function.

The full autoton TX-20 P is a non contact tonometer at the same time autopachymeter. It gives IOP, Pachy as well as the corrected IOP instantly. Previous studies have shown that the NCT can measure accurate IOP which is comparable with that of the GAT.

In our study 232 eyes of 116 patients with mean age 33.02 years the CCT was found to be 528.09±30.144. The range was 155 with maximum 606 and 451 minimum value. A table of adjustment factors for each CCT value was formulated. 553 and 554 micron CCT needed no adjustment i.e. adjustment value was zero. Above and below these values the adjustment changed as a decimal for each two consecutive CCT value e.g. 549 and 548 IOP changed by 0.2 addition and the values above 553 and 554 needed subtraction. Hence one can also say that each 100 micron change in CCT needs about 5 as adjustment factor.

Adjustment factor in Ehlers study was 7.1 for each 100 micron CCT. But later studies show a modification in this factor. The most accurate method IOP measurement is manometry. Intra cameral insertion of a cannula is the requirement of this procedure. So this accurate procedure is not feasible for clinical measurement of IOP. IOP measurements with newer tonometers such as the dynamic contour tonometer have been shown to be little affected by corneal properties such as CCT, but due high cost these are not in common use.

Jatendra jethani et in their study showed that

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</table>
Identification of Correction Factor for Intraocular Pressure Measurement Based on Pachymetry

Iatrogenic reduction in the CCT, due to LASIK procedure lead to reduced IOP value than the pre-operative recorded value and had to use a “modified” Ehler correction factor. Similarly, Ahmad Elsheikh et al used corneal model to study different aspects e.g. thickness, curvature, stiffness etc and had concluded that “modified” Ehler correction is the need. But other studies have results simulating one another without any table of correction factor. Although we have extracted the correction which is also a “modified” Ehler correction but it is readily available for use in the form of a table!

**CONCLUSION**

The pachymetry should be the part and the parcel of a complete ocular examination. More emphasis should be given to the thinner corneas while going for PRK, LASIK as well as when dealing with glaucoma. Old is gold and Goldman applanation will remain gold standard if the CCT based correction factor is incorporated.

**REFERENCES**

ABSTRACT

Purpose: To assess the efficacy of combined modified trabeculotomy and trabeculectomy in primary congenital glaucoma at a tertiary care center in Larkana.

Material and Methods: This was a prospective interventional case series study which was conducted from August 2014 to August 2016 at the department of pediatric ophthalmology, Chandka Medical College and Hospital, Larkana, Pakistan. Patients attending the OPD from birth to 14 years of age with primary congenital glaucoma were included in the study. Patients lost before six months to follow up postoperatively were excluded from the study. Silt lamp examination under general anesthesia was performed preoperatively in every case, corneal clarity, average corneal diameter, axial length and intra ocular pressure were noted and compared with postoperative values. Improvement observed in any two of the four abovementioned variables was considered as successful surgery. SPSS version 20 was used for data entry and analysis.

Results: Combined modified trabeculotomy and trabeculectomy was performed in 22 eyes of 17 patients with primary congenital glaucoma, out of which 08 (47.06%) were males and 09 (52.94%) were females. Mean age ± standard deviation was 3.37 ± 4.40 years and age range was 1 month to 12 years. Preoperative average corneal diameter was 14.47 ± 1.10 mm and postoperative average corneal diameter was 14.15 ± 1.13 mm (P < 0.015). Preoperative intra ocular pressure was 15.05 ± 6.75 mm Hg and postoperative intra ocular pressure was 9.59 ± 3.98 mm Hg (P <0.000026). Preoperative axial length was 25.30 ± 3.59 mm and postoperative axial length was 25.02 ± 3.77 mm (P <0.011). Criteria for successful surgery were fulfilled by 20(90.91%) eyes and corneas of 12 (54.54%) eyes became clear postoperatively.

Conclusion: According to our study combined modified trabeculotomy and trabeculectomy procedure is a very efficient and safe procedure for primary congenital glaucoma with a high success rate.

Keywords: Primary congenital glaucoma, Modified Trabeculotomy, Trabeculectomy, Intraocular pressure.

INTRODUCTION:

Congenital glaucoma is an important cause of blindness in children. These children need extra attention and care with early diagnosis, quick and definitive treatment. Regarding the cause, trabeculodontygenesis is a distinctive attribute of primary congenital glaucoma which may occur in isolation or in varying combinations with goniodysgenesis, iridodysgenesis and corneodysgenesis. The mainstay in the treatment of primary congenital glaucoma is surgical and medical therapy is only supportive. In comparison with surgery in adults, surgical treatment in children is much more difficult due to variable results and greater complications. Various surgical techniques have been used for the treatment of primary congenital glaucoma, such as goniotomy, trabeculotomy, combined trabeculotomy-trabeculectomy and valve implantation. All these procedures have their own benefits and drawbacks as well. Goniotomy and trabeculotomy have been used mostly as first choice surgeries. Goniotomy has the advantage of not being damaging to the conjunctiva but it cannot be performed in cloudy corneas while trabeculotomy is mutilating for the conjunctiva which can be done in opaque corneas.

Combined modified trabeculotomy-trabeculectomy has proved to be a safe method for treating primary congenital glaucoma with a success rate of 90.91%. This procedure is an initial surgical therapy in patients especially the ones with severe Glaucoma.

Some researchers have reported better results for primary congenital glaucoma treatment using combined trabeculotomy–trabeculectomy then the traditional procedures discussed earlier. This study was aimed at assessing the efficacy of combined modified trabeculotomy and trabeculectomy in primary congenital glaucoma patients at the department of Pediatric Ophthalmology, Chandka Medical College and Hospital, Larkana.

MATERIAL AND METHODS:

This was a prospective interventional case study...
series study which was conducted from August 2014 to August 2016 at the department of pediatric ophthalmology, Chandka Medical College and Hospital, Larkana, Pakistan. Patients presenting with primary congenital glaucoma, from birth to 14 years of age were included in the study after taking the informed written consent from the guardian. Patients with secondary glaucoma and those who were lost to follow up before six months postoperatively were excluded from the study. Slit lamp examination and examination under general anesthesia was done in every case and wherever feasible fundoscopy, retinoscopy and autorefractometry were also done. Preoperative corneal clarity, average corneal diameter, axial length and intra ocular pressure of patients were noted and compared with postoperative values. Corneas, on the basis of haziness, were divided into following grades:
Grade I: Mild corneal haziness
Grade II: Moderate corneal haziness
Grade III: Severe corneal haziness or scarring

Surgery was labeled successful if improvement was observed in any two of the four abovementioned variables (i.e. corneal clarity, average corneal diameter, axial length and intra ocular pressure). Patients were followed up at 1st day, two weeks, and one month postoperatively and monthly thereafter; follow up period was 06 months. SPSS version 20 was used for data entry and analysis. Frequency with percentage was calculated for gender and mean ± standard deviation were calculated for numerical variables like age, average corneal diameter, axial length and intra ocular pressure. Paired-t test was used for comparing preoperative and postoperative corneal clarity, average corneal diameter, axial length and intra ocular pressure. P-value ≤ 0.05 was considered significant.

**Surgical Technique:** All surgeries were performed by the principal author to avoid the inter-surgeon variability in surgical technique. Peritomy was performed and a fornix based conjunctival flap was raised. A 4×3 mm rectangular partial thickness scleral flap was reflected up to about 1mm of clear cornea. Then a radial incision was given in the scleral bed just paracentrally in between the clear corneal stroma and the opaque scleral stroma, about 1-2 mm away from the limbus. Keeping the field dry, the Schlemm’s canal was identified by gush of aqueous, debris or blood. 6/0 prolene or nylon suture was then inserted to confirm the position of Schlemm’s canal and to avoid false passage. No resistance offered to the passage of suture confirmed the proper position of Schlemm’s canal. Then the Harm’s rigid probe or trabeculotome was gently passed both nasally and temporally to cover about 120º of the corneal circumference. A 2×2 mm deep scleral ostium was created by removing the tissues en block and then peripheral iridectomy was performed. The partial thickness scleral flap was closed.

**RESULTS:**
Combined modified trabeculotomy and trabeculectomy was performed in 22 eyes of 17 patients with primary congenital glaucoma fulfilling the inclusion criteria and avoiding the exclusion criteria. Out of the total 17 patients, 08 (47.06%) were males and 09 (52.94%) were females. Mean age ± standard deviation was 3.37 ± 4.40 years and age range was 1 month to 12 years. Preoperative average corneal diameter was 14.47 ± 1.10 mm and postoperative average corneal diameter was 14.15 ± 1.13 mm (P < 0.015). Preoperative intra ocular pressure was 15.05 ± 6.75 mm Hg and postoperative intra ocular pressure was 9.59 ± 3.98 mm Hg (P < 0.000026). Preoperative axial length was 25.30 ± 3.59 mm and postoperative axial length was 25.02 ± 3.77 mm (P < 0.011). Criteria of successful surgery were fulfilled by 20 (90.91%) eyes and corneas of 06 (27.3%) eyes were clear at the last follow up. Corneas with Grade I haziness were 7 (31.8%), with Grade II haziness were 6 (27.3%) and with Grade III opacity were 3 (13.6%). A few complications were encountered like subconjunctival hemorrhage, hyphema, false passage, iridodialysis, shallow anterior chamber and oval pupil which were treated conservatively.

### Preoperative corneal haziness and postoperative corneal haziness cross tabulation

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<tr>
<td>% within Preoperative corneal haziness</td>
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<tr>
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<tr>
<td>Total</td>
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<td>% within Preoperative corneal haziness</td>
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</table>

| % within Preoperative corneal haziness | 31.8% | 27.3% | 13.6% | 27.3% | 100.0% |
DISCUSSION:

After being reported for the first time in 1980 by E Maul et al12, Combined Trabeculotomy-Trabeculectomy has since been used in cases of primary congenital glaucoma, especially in those who remained uncontrolled by previous angle surgeries. Subsequently combined Trabeculotomy-Trabeculectomy has been used as the first choice surgery for primary congenital glaucoma patients with higher success rates13. We also used the combined procedure of modified Trabeculotomy-Trabeculectomy as the initial surgical option for primary congenital glaucoma in this study. The overall success rate in our study was 90.91% which is similar to the earlier reports13, 14. A local study reported success rate of 80%, but the difference being that they used Mitomycin C as an adjunct to the procedure15. Mean preoperative intra ocular pressure in our patients was 15.05 ± 6.75 mm Hg and mean postoperative intra ocular pressure reduced to 9.59 ± 3.98 mm Hg (P < 0.000026). Lower intra ocular pressure readings were probably due to the effect of general anesthetic agent (Halothane). Nevertheless, the reduction in postoperative intra ocular pressure was statistically significant and also the reduction in average corneal diameter, which reduced from a mean value of 14.47 ± 1.10 mm to 14.15 ± 1.13 mm (P < 0.015). Because the intra ocular pressure readings varied with the depth of anesthesia and with the observers and also the axial length measurements could not be relied upon in the growing children, corneal clarity in these circumstances was prime indicator of the success of surgery, with average corneal diameter coming in second. Many complications like, subconjunctival hemorrhage, hyphema, false passage, iris prolapse, shallow anterior chamber, iridodialysis, descemet’s membrane stripping, seclusion-pupillae, cataract, hypotony, vitreous prolapse, choroidal detachment and exudative retinal detachment have been reported in the literature15-18, but during our study we came across subconjunctival hemorrhage, hyphema, false passage, shallow anterior chamber, iridodialysis and oval pupil, which were treated conservatively.

CONCLUSION:

Combined modified trabeculotomy-trabeculectomy has proved to be a rather safe and efficient method for treating primary congenital glaucoma in our setting with a success rate of 90.91%. We recommend this procedure as an initial surgical therapy for primary congenital glaucoma patients especially ones with severe disease.

REFERENCES:

Prevalence of Refractive Errors Causing Amblyopia in Children

Sumaira Amir B.Sc(Hon)Optometry and Orthoptics, Dilshad Alam Khan FCPS, Aamir Asrar FRCS, Fellow, (Vit-Retinal & Corneo- Refractive surgery), Mubashir Jalil FCPS,(Fellow Paed Ophth).

ABSTRACT
Objective: To determine the prevalence of refractive errors causing Amblyopia amongst age group 5-14 years.

Study design: Cross-sectional study.

Place and Duration of study: Amanat Eye Hospital, Rawalpindi from Jan 2014 – Jan 2016.

Materials and Methods: In this cross-sectional study, out of 2500 children, 500 children were found to had normal visual acuity. Ocular alignment, visual acuity, pupillary reactions, cover testing and cycloplegic refraction were recorded for all children by an optometrist. In children, refractive diagnostics had to be determined by objective refraction under cycloplegia plus subjective refraction. In case of children having amblyopia, spectacles were prescribed along with patching treatment of good eye.

Results: A total of 2000 children were found to had refractive errors. The percentage of females were more than males in total population (62% vs. 38%). There were 652 (26.08%) myopes, hyperopes 450 (18.0%), astigmatics (248 (9.92%), anisometropics 145 (5.8%) and amblyopia 650 (26.0%) in total patient population. Among 652 myopic patients, there was 52 (7.97%) with <-1.00D, 340 (52.14%) were -1.00D to -5.00D, and 260 (39.87%) were greater than -5.00D, 136 (54.82%) having myopic astigmatism, 85 (58.62%) were having anisometropia and 345 (68.31%) were found to had amblyopia. On the other hand in case of hyperopic children the figures were 35 (7.77%), 290 (64.44%), 125 (27.77%), 112 (45.66%), 60 (41.37%) and 160 (31.68%) for hyperopia <+1.00D, +1.00D to +3.75D, >+4.00D, hyperopic astigmatism, hyperopic anisometropia and amblyopia respectively. There were 345 (52.91%) myopics, hyperopics 160 (35.53%), astigmatic and anisometropic amblyopes 83 (33.46%) and 62 (26.75%) respectively.

Conclusion: Amblyopia is not uncommon in the early years of life. More myopic children are affected as compared to hyperopic children.

Key words: Myopia, Hyperopia, Amblyopia

INTRODUCTION
Uncorrected refractive error is the leading cause of eye problem worldwide and the second cause of blindness. There are about 2.3 billion people having refractive error, out of them, only 1.8 billion have access to eye health care services. Children are more vulnerable, because uncorrected refractive error can result into a dramatic impact on learning process and educational capacity. Special attention has to be given to school age because it is the age at which refractive error begins. The prevalence of myopia is less than 2% before 7 or 8 years but increases with age and reaches 20% at 15 years. The potential risk factors for myopia were family history and near work during childhood. Most refractive errors can be managed by early refractive correction. If it cannot be treated in childhood, may come up with amblyopia, resulting in partial blindness. The correction can be done by spectacles, contact lenses or refractive surgery. The most commonly used correction method is spectacles. Hence spectacles are treatment of choice for refractive errors in developing countries.

Amblyopia occurs in 32.50% of population with refractive errors as compared to 26.0% of total patient population. There is more occurrence of amblyopia in myopic population as compared to hyperopic population (52.91% vs. 35.53%).

Amblyopia is a unilateral or rarely bilateral reduction of best corrected visual acuity resulting from vision deprivation or abnormal intraocular interactions during early years of life in the absence of an ocular or its posterior visual pathway abnormalities. It can arise from squint (abnormal binocular interaction) or any form of visual deprivation e.g. dense corneal or lenticular opacity, high ametropia, anisometropia or astigmatism. Early start of treatment is essential to correct the vision in amblyopia. The success rates are better if treatment of amblyopia is instituted by 7-8 years of life in strabismic amblyopia and early teens in refractive amblyopia. It is here that amblyopia gains importance for its early detection and prompt treatment. In case the treatment is started after the age limit, visual improvement may range from unsatisfactory to no
Prevalence of Refractive Errors Causing Amblyopia in Children

improvement.

Although strabismus is an important cause of amblyopia, its early detection by parents due to cosmetic concerns is apparent. Hence advice of ophthalmologist is sought and early treatment started. But in case of refractive amblyopia ( ametropia, meridional and anisometropia) it can remain unnoticed due possibly to better vision in one eye, thus amblyopia may remain unnoticed till late.

METHODOLOGY

Cross-sectional descriptive study was conducted in settings of Amanat Eye Hospital, Rawalpindi during the time period of Jan 2014 to Jan 2016. Consecutive sampling technique was conducted to collect the sample of 2500 children with age group 5-14 years.500 children were found to have normal visual acuity. Properly informed consent was taken from the patients. An approval was taken from the hospital ethical committee.

Inclusion criteria: We included the ages of 5-14 years, decreased vision in one or both eyes less than 6/9 Snellen’s chart, all were checked after cycloplegic refraction.

Exclusion criteria: It excluded neurological impairment, nystagmus, optic nerve disease and congenital eye diseases.

Detailed history was taken from the child and parents including family history, birth history, about the current problems, history of using glasses, past problem, treatment, medicine used was recorded. Monocular and binocular visual acuity was taken by trained optometrist by using Snellen’s chart at the distance of 6M. Visual acuity was taken with pinhole as well. Students with visual acuity less than 6/9 underwent auto refraction. In children, refractive diagnostics had to be determined by objective refraction under cycloplegia plus subjective refraction. Cycloplegic refraction was done by cyclopentolate eye drops 0.5% in every child. Pupillary reactions, ocular motility, cover-uncover test for distance and near, examination of anterior segment by slit-lamp and posterior segment by direct ophthalmoscope were recorded. In case of vision not improving with refraction and pinhole, patients were examined by ophthalmologist. After best-corrected refraction, patients were prescribed glasses and instructed to use glasses strictly. Those having vision not improving with glasses, final diagnosis of amblyopia was made by consultant and then patching of good eye to encourage use of amblyopic eye were advised by a trained optometrist. Children were then followed up for vision improvement after patching treatment for amblyopia.

RESULTS

A total of 2500 children with 5-14 age group were assessed for refractive error that caused amblyopia. 500 children were found to have normal visual acuity, whereas 2000 children had refractive errors. There were 950 males and 1550 females. The ratio of females were more than males in total population (62% vs. 38%). There were 652(26.08%) myope, hyperope 450(18.0%), astigmatism 248(9.92%), anisometropia 145(5.8%) and amblyopia 650(26.0%) in total patient population as shown in table 1. Of 650 cases of amblyopia in this study, 62(9.53%) were anisometropic. Among 652 myopic patients, there was 52(7.97%) with refractive error -<1.0D, 340(52.14%) were -1.0D to -5.0D, and 260(39.87%) were greater than -5.0D, 136(54.83%) having myopic astigmatism, 85(58.62%) were having anisometropia and 345(68.31%) were found to have amblyopia as shown in table 2.

On the other hand in case of hyperopic children the figures were 35(7.77%), 290(64.44%), 125(27.77%), 112(45.66%), 60(41.37%) and 160(31.68%) for hyperopia <+1.0D, +1.0D to +3.75D, >+4.00D, hyperopic Table no: 1 Distribution of refractive error

<p>| Myopia = 652 | Hyperopia = 450 | Astigmatism =248 |</p>
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<td>52.14%</td>
<td>39.87%</td>
<td>7.77%</td>
<td>64.44%</td>
<td>27.77%</td>
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Table no: 2 Anisometropia and amblyopia

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<tr>
<td>85</td>
<td>60</td>
</tr>
<tr>
<td>58.62%</td>
<td>41.37%</td>
</tr>
<tr>
<td>64.31%</td>
<td>31.68%</td>
</tr>
</tbody>
</table>

Table no: 3 Amblyopia distribution

<table>
<thead>
<tr>
<th>Total patient population</th>
<th>Cases of refractive error</th>
<th>Myopia group</th>
<th>Hyperopia group</th>
<th>Astigmatic group</th>
<th>Anisometropia</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.0%</td>
<td>32.50%</td>
<td>52.91%</td>
<td>35.53%</td>
<td>33.46%</td>
<td>42.75%</td>
</tr>
</tbody>
</table>
astigmatism, hyperopic anisometropia and amblyopia respectively. Amblyopia was present in 650(26.0%) in total population with 32.50% cases of refractive error. There were 345(52.91%) myopia, hyperopia 160(35.53%), astigmatic and anisometropic amblyopia 83(33.46%) and 62(42.75%) respectively as shown in table 3.

DISCUSSION

The number of people globally with refractive errors has been estimated to be one to two billions. Rates vary between regions of the world with about 25% of Europeans and 80% of Asians affected. Near-sightedness is the most common disorder. Rates among adults are between 15-49% while rates among children are between 1.2-42%. Far-sightedness more commonly affects young children and the elderly. The number of people with refractive errors that have not been corrected was estimated at 660 million (10 per 100 people) in 2013. Of these 9.5 million were blind due to the refractive error. It is one of the most common causes of vision loss along with cataracts, vitamin A deficiency and macular degeneration.

Prevaling rates of amblyopia in different populations is reported differently in literature. It may be due to different target populations, age groups, facilities for vision checkup, literacy rate, racial and geographical factors affecting the results. Thus Andrey Chia and colleagues reported a rate of 0.8% amblyopia in their population of 6-72 month children, while another Turkish study conducted by Jing Fu and associates calculates it to be 2.5% and its target population was average age of 12.4 years.

A Turkish study revealed it to be 5.5% in the target population of 7-8 years children and an Iranian study concluded it to be 1.9% in the target population of students 13.2 years old school children. In this study, patient population was between 5–14 years, Myopia appears to be a more common refractive error than hypermetropia in study population and amblyopia was found to be commoner in myopia as compared to hyperopia(52.91% vs. 35.53%). Results are comparable to many national and international studies.

CONCLUSION

Amblyopia occurs in the presence of different types of refractive errors if present during the early years of life. It was present in 32.50% of population with refractive errors as compared to 26.0% of total patient population. There was more occurrence of amblyopia in myopic population as compared to hyperopic population (52.91% vs. 35.53%).

REFERENCES

Recent Advances in the Treatment of Retinoblastoma (Rb)

Hussain Ahmad Khaqan, Irshad Nabi Sandhu, Hafiz Attique Ur Rehman, Hassan Raza Chaudhary, Abdul Hye

ABSTRACT:

In this study, we have reviewed chemotherapy alternatives for retinoblastoma using intra-arterial, periocular, and intravitreal routes. This review aims to highlight recent advances in the management of Rb that have contributed towards improving treatment outcomes. Noval therapeutic directions are actively being pursued for advanced retinoblastoma cases, as well as treatment developments which decrease the risks of systemic chemo therapy. Recently, the use of targeted delivery of chemotherapy to the eye in the form of selective intra-arterial and intravitreal chemotherapy has shown promising results. However, a multimodal treatment protocol has improved survival in children with extraocular disease. Nevertheless, challenges remain, especially for the developing world. This review aims to highlight recent advances in the management of Rb that have contributed towards improving treatment outcomes.

INTRODUCTION:

There are number of experimental adjuvant therapies that have been shown to be efficacious in animal models and may be part of future armamentarium of cancer treatment. Treatment of retinoblastoma has undergone significant advancement over the past few decades salvaging therapies with chemo-reduction and focal consolidation are favoured over external beam radiation and enucleation. However in other continents like Arica survival rate has dropped significantly.[1,2]

Retinoblastoma (Rb) is the most common intraocular malignancy of childhood. The incidence is reported to be approximately 1 in 18,000 live births worldwide.[3,4] Leukocoria is the most frequent symptom at presentation, and other symptoms include poor vision, redness, squint, or proptosis.[5] The majority of children are diagnosed before 5 years of age. The disease may be unilateral or bilateral; bilateral involvement is seen in one third of cases. Although potentially curable, the prognosis for survival is dependent on early diagnosis and appropriate therapy. The management of Rb is complex and challenging and often requires a multidisciplinary approach. Goals of therapy consist of life salvage, globe salvage, and vision preservation, whenever possible. Recently, the use of targeted delivery of chemotherapy to the eye in the form of selective intra-arterial and intravitreal chemotherapy has shown promising results.). For advanced orbital disease, a presentation not uncommon in developing countries, a multimodal treatment protocol has improved survival. Nevertheless, challenges remain, especially for the developing world.

There are several chemotherapy approaches to treat retinoblastoma. Most children with bilateral retinoblastoma receive systemic IVC control and prevention of ocular tumors pinealoblastoma and long-term secondary metastasis. For unilateral retinoblastoma, IAC provides excellent control with minimal side effects. Periocular chemotherapy is also used in conjunction with IVC (with increased doses) in advanced cases. Intravitreal chemotherapy is currently reserved for those eyes with recurrent vitreous seedlings and incomplete control with other methods.

Life, globe and vision saving treatment: Conservative treatments which can result in life saving, globe and vision saving are successfully used. The therapies for retinoblastoma include systemic chemotherapy, focal consolidation with transpupillary thermotherapy, laser photocoagulation and cryotherapy, radiation treatment with plaque brachytherapy or EBRT, and local injections of chemotherapeutic agents through the subtenon or subconjunctival route, as an adjunct to systemic chemotherapy, recent advances in treatment includes selective intra arterial chemotherapy and intra vitreal chemotherapy. The most common chemotherapy drugs used intravenously are vincristine, etoposide, and carboplatin (VEC). Systemic chemotherapy
Recent Advances in the Treatment of Retinoblastoma (Rb)

combined with focal therapy has been the mainstay of globe preserving treatment for less advanced disease.[9] Selective intra-arterial chemotherapy: Although systemic chemotherapy in combination with focal therapy has achieved good outcomes, intravenous chemotherapy can lead to serious toxic side effects including myelosuppression and infection. As a result, newer treatment approaches have focused on localized delivery of chemotherapy to minimize the systemic side effects of intravenous chemotherapy. One such novel approach is selective intra-arterial chemotherapy (SIAC), which delivers targeted chemotherapy to the eye harboring the tumor through the ophthalmic artery. Being a site directed approach, it has fewer systemic side effects as compared to intravenous chemotherapy.

Melphalan is the drug of choice for intra-arterial chemotherapy. In 2004, the Japanese investigators described the technique of “selective ophthalmic artery infusion” (SOAI), where a microballoon catheter was positioned by a transfemoral artery approach at the cervical segment of the internal carotid artery just distal to the orifice of the ophthalmic artery.[7] The Japanese technique of SOAI was further developed into direct intra arterial (ophthalmic artery) infusion under the pioneering work of Abramson and Gobin in New York.[9] They introduced the technique of superselective infusion by advancing a microcatheter into the orifice of the ophthalmic artery by a transfemoral artery approach. In a Phase I/II clinical trial, Abramson et al. reported their initial experience with intra-arterial ophthalmic artery chemotherapy using melphalan in ten children with advanced Rb who were indicated for enucleation.[9] They reported a dramatic regression of tumors, vitreous seeds, and subretinal seeds (SRS) in each case.[9] No severe systemic side effects such as sepsis, anemia, neutropenia, or death occurred.[9] In another study, Gobin et al. reported their experience of selective ophthalmic artery cannulation on 95 eyes of 78 patients with unilateral or bilateral advanced intraocular Rb.[9] The Kaplan–Meier estimates of ocular event free survival rates at 2 years were 70.0% for all eyes, 81.7% for eyes that received IAC as primary treatment, and 58.4% for eyes that had previous treatment failure with intravenous chemotherapy and/or external beam radiation therapy.[9]

There were no permanent extraocular complications, thus suggesting that IAC is safe and effective for the treatment of advanced intraocular Rb.[9] Since then, several investigators have reported their experience with IAC.[10,27] In a study done by Tuncer et al.,[26] Group D eyes of 24 treatment naïve Rb patients managed primarily with IAC were included.[16] Each eye received a mean of three IAC sessions/eye (range, 2–5 sessions). Complete regression of the main tumor was achieved in 23 of 24 eyes. One eye with partial regression required enucleation due to ciliary body involvement by the tumor. They concluded that enucleation or external beam radiotherapy could be avoided in the majority of eyes with advanced intraocular Rb managed primarily with IAC.[26] In another study, Michaels et al. reported the toxicities and outcome of 19 eyes in 17 patients with Rb receiving selective ophthalmic artery infusion chemotherapy (SOAIC) treatment between 2008 and 2013.[17] From the 87 treatments, mild local reactions were common. Myelosuppression was more common after triple agent SOAIC than single agent melphalan.

Ocular salvage was achieved in 11 of 19 eyes and associated with triple agent therapy.[17] Simultaneous bilateral ophthalmic artery chemosurgery (OAC) for bilateral Rb (tandem therapy) has also been reported, wherein 116 eyes were salvaged.[19] Kaplan–Meier ocular survival was 99.2% at 1 year, 96.9% at 2 and 3 years, and 94.9% for years 4.[18] There were no cases of metastatic disease or metastatic deaths with a mean follow up of 3.01 years.[19] The effect of IAC as a rescue therapy was investigated in recurrence of Rb in eyes previously treated with IAC, using melphalan (5 mg, 7.5 mg) alone or with additional topotecan (1 mg).[19] The study concluded that rescue IAC provided tumor control in 75% of cases and globe salvage in 67%.[19] Rescue IAC could be considered in children who fail initial IAC, especially if the opposite eye had been enucleated.[19] Chen M et al. have studied the effect of IAC in infants <3 months.[18] The mean patient age at the first IAC treatment was 10.4 weeks (range 4.9–12.9 weeks). A total of 28 catheterizations were performed. After a mean follow up of 28.3 months (range 9–65 months), tumor regression was observed in 12 of 13 eyes.[20]

All patients were alive and no patient developed metastatic disease or other malignancies. Their study suggests that IAC as primary therapy is a feasible and promising treatment for Rb in infants <3 months of age.[20] An interesting case of IAC in adult onset Rb has been described.[20] A 32 year old man with active unilateral Group D Rb that was recurrent following EBRT was treated with IAC, leading to tumor regression. Additional plaque radiotherapy and intravitreal chemotherapy were required for complete control.[21] In a retrospective case series, Shields et al. compared the effects of IAC before and after intravitreal chemotherapy.[22] Sixty six eyes of 66 patients with untreated unilateral Rb were studied. IAC into the ophthalmic artery under fluoroscopic guidance was performed using melphalan in every case, with additional topotecan as necessary. They found that using IAC plus additional intravitreal chemotherapy (as needed for vitreous seeding) improved globe salvage in eyes with advanced Rb.[22] Leal Leal et al. have reported their experience of globe salvage with intra-arterial topotecan melphalan chemotherapy in children with a single eye.[23] All patients were treated with three courses of a combination of melphalan 4 mg and topotecan 1 mg. They concluded that SIAC is safe and effective for preventing enucleation of 55% of affected eyes in this group.[23] In another interesting study, the results of IAC for control of persistent or recurrent sub retinal seeds following previous chemotherapy for Rb were reported.[24] A total of thirty eyes of 29 patients were included in this study. Each eye received a mean of three IAC sessions. The authors concluded that IAC can be an effective second or third
line therapy in the management of massive persistent or recurrent sub retinal seeds from Rb following previous chemotherapy.\textsuperscript{24} IAC for Rb is not always a straight forward procedure, and it may require an adaptable approach. A study done by Bertelli et al. illustrates strategies used when the ophthalmic artery is difficult to catheterize or not visible, and it ascertain the effectiveness and safety of these strategies.\textsuperscript{25} They recognized three different patterns of drug delivery: a fixed pattern through the ophthalmic artery, a fixed pattern through branches of the external carotid artery, and a variable pattern through either the ophthalmic or the external carotid artery. Alternative routes of IAC for intraocular Rb appeared in the short term as effective and safe as the traditional drug infusion through the ophthalmic artery.\textsuperscript{26} Yannuzzi et al. compared enucleation and OAC and found that there were more orbital recurrences in the group primarily treated with enucleation. OAC for advanced intraocular Rb was not found to increase the chance of orbital recurrence, metastatic disease, or death compared with primary enucleation in their study.\textsuperscript{27} Recently, a study\textsuperscript{28} has described the outcomes and complications of selective IAC in Rb in Indian eyes. It was a retrospective intervention case series, in which 6 eyes with Rb underwent IAC using melphalan (3 mg/5 mg/7.5 mg) and topotecan (1 mg) (n = 4) or melphalan (3 mg/5 mg/7.5 mg) alone (n = 2). A mean of three IAC sessions were given in each eye. Following IAC, three cases (50\%) showed complete regression of the main tumor, 2 (33\%) had partial regression, while 1 case (17\%) showed no response. Diffuse choroidal atrophy and vitreous hemorrhage were observed in 1 (17\%) eye each. There was no hematologic toxicity or cerebrovascular events. It was concluded that IAC could be considered to be an effective therapy for globe preservation though larger studies with longer follow up are required for adequately validating the results.\textsuperscript{29}

**Periocular Chemotherapy:** Periocular injection of carboplatin has been used for retinoblastoma control over two decades, often as an adjunct to systemic chemotherapy. Periocular injection of Topotecan 0.18mg/kg has been advocated in recent years in adjuvant with systemic chemotherapy. Periocular chemotherapy achieves rapid levels within the vitreous in 30 min, achieves doses that are 6–10 times that achieved by intravenous route, and can last for hours. The route of delivery has varied as either sub-conjunctival or sub-tenons space location. Because of later recurrences, however, this therapy was used more often in conjunction with systemic chemotherapy to boost the local dose of chemotherapy in the vitreous.

Complications of periocular chemotherapy include orbital and eyelid edema and ecchymosis, orbital fat atrophy, muscle fibrosis leading to strabismus, and optic atrophy. Long-term observations on complications have not been published.\textsuperscript{28}

**Intravitreal Chemotherapy:** Vitreous seeds remain the biggest challenge in the management of Rb as they have a poor response to intravenous chemotherapy. Intravenous chemotherapy has poor penetration in the avascular vitreous cavity. Intravitreal chemotherapy is not a primary treatment modality but used as a salvage therapy in cases of recalcitrant and recurrent vitreous seeds.\textsuperscript{29} Melphalan is a cytotoxic nitrogen mustard derivative alkylating agent that inhibits both DNA and RNA synthesis. The use of intravitreal melphalan is based on vitro studies conducted by Inomata and Kaneko. Among the 12 anticancer drugs that were studied, they found melphalan to be the most effective against Rb.\textsuperscript{30} Munier et al.\textsuperscript{31} have used melphalan as the drug of choice in a dose of 20–30 µg/0.1 ml. The injection is given 3–3.5 mm away from limbus. The globe is rotated after injection for the uniform distribution of drug. After taking out the needle, triple freeze thaw cryotherapy application is done on the needle track to avoid needle track seeding. The injection can be repeated every 7–10 days until complete response is achieved. They have also described the types of regression of vitreous seeds: (1) complete disappearance (regression type 0); (2) refringent and/or calcified residues (regression type I); (3) amorphous, non-spherical, inactive residues (regression type II); or (4) a combination of the last two (regression type III).\textsuperscript{32} The followings are the contra indications for intravitreal injection: Anterior segment/ciliary body invasion/other features of Group E Rb, the presence of complete PVD, diffuse vitreous seeds in all quadrant, and total retinal detachment.\textsuperscript{31} Munier et al.\textsuperscript{31} reported a vitreous seed regression rate of 87\% in eyes that had already been previously treated with systemic intravenous and/or IAC. Shields et al. have shown a 100\% success rate of intravitreal chemotherapy at 2 year follow up.\textsuperscript{33} Some authors have also used topotecan as intravitreal injection. Topotecan has a longer half life; it is used in a concentration of 8–20 µg/0.04 ml. Ghassemi et al. studied the effect of intravitreal topotecan (8–20 µg in 0.04 mL of balanced salt solution) combined with melphalan (40 µg in 0.04 mL of diluent) in nine eyes and found the combination to be safe and effective.\textsuperscript{34} The effects of intravitreal chemotherapy on retinal function as studied on electroretinogram (ERG) are conflicting. Brodie et al. reported that photopic ERG was not affected following melphalan injection, indicating preservation of retinal function after a dosage of 20–30 µg whereas Francis et al. in their study have reported reduced ERG amplitude, indicating permanent retinal toxicity.\textsuperscript{35} The risk of extraocular spread following intravitreal injection in Rb was evaluated by Smith et al.\textsuperscript{36} Of the 315 eyes of 304 patients who underwent 1300 injections, the proportion of patients with extraocular spread was found to be 0.003.\textsuperscript{37}

**What can be done?** Delayed presentation due to lack of awareness and accessibility to proper medical facilities at the primary and secondary levels of health care were major obstacles in achieving high cure rate. These hurdles need to be overcome by making efforts toward facilitating early diagnosis and avoiding delays in the referral system. A nationwide awareness campaign to educate the public and health-care professionals about early signs of Rb is required. Strengthening of medical facilities for diagnosing and
treating Rb at the primary and secondary levels of health care will also go a long way in reducing mortality and morbidity associated with the disease which may lead to improved outcomes, globally comparable.

In summary, There are several chemotherapy approaches to retinoblastoma treatment. In general, most children with bilateral retinoblastoma receive systemic IVC for tumour control and prevention of metastasis, pinealoblastoma, and long-term secondaries. For unilateral retinoblastoma, IAC provides excellent control with minimal systemic effect. Periocular chemotherapy is used in conjunction with IVC to enhance dose at the eye in advanced cases. Intravitreal chemotherapy is currently reserved for those eyes with recurrent vitreous seeds following incomplete control with other methods.

REFERENCES:
Free Eye Camp - a Powerful tool for Eliminating Avoidable Blindness in the Third World Countries

Sadiqullah Khan, M.Sc., FCPS\(^1\), Surriaya Zaman, MPH (Com. Eye Health)\(^2\) Muhammad Ishaq, M.Phil (Physiology)\(^3\) Prof. Nasir Saeed, FCPS\(^4\)

ABSTRACT

Background: Age related cataracts is the most common cause of blindness in the third world. 14,000 new patients with cataract appear every day as the eye diseases are common in the under privileged communities. The major reasons of eye problems in these societies are illiteracy, poverty and unawareness of the modern facilities in the prevention of eye ailments. One of the best ways to approach these communities is to provide treatment facilities closer to their dwellings.

Aim: In order to reduce the burden of visual impairment and blindness is to provide the health facilities through holding eye camps close to their vicinity as these masses have little access to the benefits of modern treatment. Though we collected the date of complete health problems, but we will discuss only visual disabilities. We desired to provide high quality surgery by using state-of-the-art technology resulting early visual recovery and improved quality of life.

Materials & Methods: Free eye camps were established in the village schools in districts of Peshawar. Complete protocol was followed for examination of male and female patients. In most of the cases extra-capsular lens extraction was performed with implantation of intraocular lens (IOL). In some cases phacoemulsification was preferred over open surgery.

Results: In 17 eye camps 10983 individuals availed the facility, amongst them, 725 patients were referred to our tertiary care hospital for further detailed evaluation of their condition. The incidence of cataract was 7.0% in both adults and children. Thus as a total 42% of the patients referred for surgery from the camps came to the tertiary care hospital for surgery while the remaining 58% did not care for the treatment.

Conclusion: Eight percent (8%) of our adult population was suffering from cataract with the females outnumbering the males as they are found to be less privileged to avail the treatment opportunities. The methodology of organizing eye camps in remote areas as a very effective source of providing solution to their sufferings.

Key words: Eye camp, Cataract surgery,
The aim of eye camps is to approach those people who are living in remote areas and they are unaware of the latest available treatment of eye disease, refractive errors, diabetic retinopathy, age related macular degeneration and other miscellaneous eye diseases. Therefore, the role of free eye camp services is very important in combating the medical problems and visual disability with special reference to the global initiative of Vision 2020. To achieve this goal, we, the Pakistan Institute of Community Ophthalmology, Hayatabad, Peshawar, (PICO) with the collaboration of Lions Club International, Peshawar, arranged and organized 17 eye camps from January 2014 to December 2015 in Gulbahar area of Peshawar. The camps were conducted as a part of government National Program for Control of Blindness (NPCB) in a radius of about 80 kilometers around our tertiary care center which covers both under privileged zones of urban and rural community.

The purpose of the study is to approach the under-privileged communities and to treat them effectively in order to reduce the burden of visual disability. The main objectives to organize and establish eye camps and to improve the quality of life. In fact, its purpose is many folds as it may indicate advise them for problems other than eyes right at their doorsteps. We collected a large data in the camps but we were more concerned with the cataract and other visual problems especially the female patients who cannot participate due to social taboo.

MATERIALS & METHODS:
Free eye camps are established in the village schools in the district of Peshawar. People of the areas were informed about the camps and their purposes through all available means like newspaper, Masjid loudspeaker announcements, pamphlet, and local community health worker volunteers etc. The male and female patients of the community were handled separately at all levels. Moreover, while dealing the patients, complete protocol of a tertiary care hospital (Pakistan Institute of Community Ophthalmology, Hayatabad, Peshawar) was followed at all levels as far as possible to achieve maximum benefits to the people living in remote areas when health services are meager.

A local school building of the area was selected for this purpose and hospital protocol is observed for the examination and treatment of these patents. WHO classification of visual impairment7 was followed as for as possible to achieve maximum benefit.

Complete medical checkup, screening test for infectious disease and routine medical examination were performed for cataract surgery. Re-examination (ocular, general and systemic) of the referred patients was carried out before cataract surgery including biometry in selected cases. In most of the cases extra-capsular lens extraction was performed with implantation of suitable (power calculated) intraocular lens (IOL). In some cases of phacoemulsification was preferred over open surgery. All patients were operated as a day cases.

RESULTS:
The data, which was collected during 17 camps organized and established during 2015 and 2016 in the area of Peshawar as mentioned above, is presented in the following tables.

Table 1 shows that 10983 patients attended 17 camps among which 725 individuals were referred to our tertiary care hospital for further detailed evaluation of their cataracts. The cataract patients were 7.0% of the total attendees including both adults and children. The data for adults is submitted in the current presentation while data for children will be presented in another article because cataract is primarily a disease of old age and is relatively rare in children, accounting for only 4% of global blindness.

Figure 1: The data of table 1 is show in graphic form to visualize the data for ready comparison.

Table 2 shows that amongst the adults 40% were males and 60% were females who attended the camps. Among the male adults 40% and among the female adults 60% were referred for surgery. Interestingly, in this case the same male/female ratio was maintained in which ratio they participated in the camps meaning that females are more suffering from cataract. But, only 27% of the males and only 15% underwent surgery. Thus as a total 42% of the patients referred for surgery from the camps came to our TCH for surgery while the remaining 68% did not report.

DISCUSSION:
Cataract causing visual loss is associated with reduced HRQoL (Health-related quality of life) and economic poverty among older adults in low-income countries. Our country is one of the poor states of the world community; therefore, it is not completely possible, in most of the cases, neither for the country nor the patients to afford the expenses of the cataract surgery alone, therefore, the likely outcome may be
blindness. In a study it was concluded that almost a fifth of the older population had lens opacities\textsuperscript{8}. That is why, in our opinion, free eye camps can be utilized as a cheap tool to treat the cataract of the community people at their doorstep to achieve the goals of Vision 2020.

Our data confirms that about 8\% of our adult population is suffering from cataract including 40\% adult males and 60\% adult females (Table 2) signifying that females of the communities are more affected than males. However, it is surprising that only 27\% of the adult males and much more astonishing that only 15\% of the adult females avail the free opportunity of the eye camps though females were more to suffer. Therefore, the percentage of operated female patients was quite less than the expected number. Based on our social and cultural setup, female population have full dependence on the males members who are hesitant to bring them out of homes due to their false religious customs and beliefs, superstitions, financial stringency, ignorance, illiteracy, poverty, fear of surgery, false assurances from some community people advising them not to go for surgery as it will further deteriorate their illness. However, in our opinion, poverty and financial problems are not the reasons as we provided everything free in the camps including free pick and drop facility. In our villages it is also very often that quakes of their camps are to be organized and it should be continued.

### CONCLUSION:

About 8\% of our adult population, complaining of eye problems, is suffering from cataract related visual impairment with the females outnumbering the males and the females are less privileged to avail the treatment opportunities. Therefore we concluded that organizing the free eye camps in remote areas with modern techniques of the treatment are quite useful and very effective.

### RECOMMENDATIONS:

1. There is a dire need of proper eye health teams including ophthalmologist for the rural area of KPK.
2. Proper visit protocol in specific area with time table at proper places in the villages for camps should be observed to facilitate our non-urban population.
3. Continuous and sustainable services with the help of NGOs and the Government is the need of the hour.
4. REFERENCES:

### Table 2: Summary of adults’ data

<table>
<thead>
<tr>
<th>Categories</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Patients</td>
<td>3743 (40% of total)</td>
<td>5595 (60% of total)</td>
<td>9338 (85% of total)</td>
</tr>
<tr>
<td>Referred to TCH for Surgery</td>
<td>290 (40% referred)</td>
<td>435 (60% referred)</td>
<td>725 (8% of total)</td>
</tr>
<tr>
<td>Operated</td>
<td>193 (27% of those referred)</td>
<td>112 (15% of those referred)</td>
<td>305 (42% of those referred)</td>
</tr>
</tbody>
</table>

During the follow-up of the operated patients, we observed that on the first postoperative day the visual acuity of all the patients was normal or nearly normal without refraction. Similar results are also shown in an earlier study\textsuperscript{12}. Our study shows that the measures used for the cataract treatment in the camps were quite satisfactory. Therefore, it can be concluded that with a little efforts, blindness which my otherwise be caused by cataract can be avoided completely utilizing the cheap tools of free eye camps. In our opinion the camps are to be organized and it should be continued.

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Comparison of Pre & Post Operative Astigmatism in Extracapsular Cataract Extraction at Fatima Memorial Hospital, Lahore

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ABSTRACT:
Background: Cataract surgery has undergone revolutionary changes but the traditional extra capsular cataract extraction is still in practice in the developing countries. The basic aim of ophthalmic surgeon through surgery is to give best uncorrected or corrected visual acuity to the patient after cataract surgery. However sometimes significant postoperative astigmatism can impair visual results and causes issues for patients and doctors also.

Objective: To compare the changes in postoperative astigmatism after extra capsular cataract extraction and pattern of astigmatism after surgery.

Method: A preoperative study of 40 cases undergoing extra capsular cataract extraction was conducted at Fatima Memorial Hospital. The cases were assessed preoperatively and postoperatively on 1st day, 1st week and 6th week with respect to induced astigmatism.

Result: The changes in Keratometric astigmatism was very significant after first day and first week of surgery as compared to preoperative astigmatism. The mean power of cylinder preoperatively was -1.1250 and 1st day after surgery was -3.4738 as well as after 1st week was -3.0188 which are significantly higher than preoperative value of astigmatism . Axis was 65% with the rule after 1st week. After 6 weeks (after suture removal) astigmatism became relatively reduced but not much the mean value was -1.3250.

Conclusion: In extra capsular cataract extraction surgery astigmatism increases at first because of sutures but with the passage of time decreases gradually and after suture removal astigmatism become reduce but does not reverse back fully as compare to pre operative astigmatism. It concluded that ECCE causes astigmatism which is continued to change afterwards, especially in the position of axis.

Keywords: ECCE, surgically induced astigmatism, visual rehabilitation.

INTRODUCTION

More than 50 million people in the world are currently blind according to statistics, and most significant and biggest cause of blindness is cataract. There are 1.5 million new cases of cataract blindness occurring in the worlds’ indigent population per year.1 In Pakistan the rate of blindness is even higher (i.e. 1.78% of total population).2 The visual acuity of patients following cataract extraction has been shown to be significantly improved than preoperative vision in every age group.3

Two main objectives of cataract surgery in recent era is to minimize induced astigmatism and achieve rapid visual recovery. Hence, the aspect of increasing surgical volumes. The ideal goal is to provide high quality eye surgery in the face of limited resources in developing nations.4

However even with modern techniques of extra capsular cataract extraction particularly those with incisions larger than 3mm, poor vision can result from astigmatism. It is because of wound closure which for these large incisions still requires to be closed with sutures which can inadvertently create tension in certain meridia of the cornea. The location of the incision is also important as certain loci can induce astigmatism more than others. Suture placement and whether sutures are removed postoperatively are also important in the development of astigmatism. All these lead to astigmatism which is difficult to correct and this has been the bane of these types of surgeries.

When extra capsular cataract extraction is done with interrupted sutures, astigmatism occur due to sutures tightness. But after 6 week, and suture removal, it reverses a bit. However, astigmatism does exist more after surgery as compare to pre operative condition and astigmatism goes higher with the passage of time, even the pattern of astigmatism changes The axis remain mainly with the rule postoperatively.

Astigmatism means unequal curvature of the refractive surfaces of the eye. Thus a point source of light cannot be brought to a focus on the retina but is spread over a more or less diffuse area. This results from the radius of curvature in one plane being longer or shorter than the radius at right angles to it. There
are basically two types of astigmatism that are based on axis of the principal meridians and on the focus of the principal meridians. On the axis basis, the different types are regular astigmatism in which the principal meridian are perpendicular and irregular astigmatism where the principal meridians are not perpendicular. This is also called Murdoch syndrome. In the axis basis, the subtypes are as follows, with-the-rule astigmatism where the axis is between 0 and 30 or 150 and 180 degrees. Against-the-rule astigmatism has the axis between 60 and 120 degrees. Oblique astigmatism has an axis between 30 and 60 or 129 and 150 degrees. In the process of the postoperative management of these patients, an over refraction is often needed to enable the patient have the satisfaction of clear vision at different distances. Clear vision may however elude some patients in some cases. Thus there may be need for high corrective cylindrical lens in many of the patients which may possibly result in some instances, to poor tolerability of the optical prescription by the patient.  

Minimal post-operative astigmatism, rapid visual rehabilitation and the possible best uncorrected visual acuity (UCVA) are the aims of modern cataract surgery. The cost incurred in phacoemulsification does not allow it to be the ideal method of surgery of cataract extraction for the mass in developing countries where possession of sophisticated expensive instruments is not viable for most institutions.

No doubt cataract surgery has undergone revolutionary changes but the traditional extra-capsular cataract extraction (ECCE) with continuous or interrupted sutures is still practiced in the developing countries. However post operative astigmatism in this technique is definitely a distressing challenge for patients and surgeons. Traditional ECCE with PC IOLs causes postoperative astigmatism in most patients. Majority of them has with the rule astigmatism, which decreases gradually during the first postoperative year and may change into against the rule astigmatism.

MATERIALS AND METHODS:

Total number of patients included in this study was 40. Patients with age related cataracts were included in the study. Limbal based corneal incisions were sutured with 10/0 nylon interrupted suturing in all cases. All keratometric readings were recorded in diopters. Axis mentioned in article were after 1st week and 6th week. Sutures were removed after 6 weeks of surgery. All surgeries are performed by single surgeon at Fatima Memorial Hospital, Lahore during a period of 6 months. All data was collected through performa. It was a retrospective study and paired sample t test was used in this research.

RESULTS:

The mean of preoperative cylindrical number is -1.1250 and the mean of postoperative cylindrical number after a day is -3.4738. There is a great difference found in preoperative astigmatism and postoperative astigmatism after one day.

In paired sample t test the t value of preoperative cylindrical number and postoperative cylindrical number is 11.303 and p value is .000 which shows that there is great difference found in preoperative astigmatism and postoperative astigmatism after a day and the data is statistically significant.

The t-value of pre and postoperative cylindrical number after 1 week is .000 which is highly significant. This shows that there is a great difference of astigmatism found in pre and post operative astigmatism after one week.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre OP Astigmatism-Post OP Astigmatism After 6 week (immediately after suture removal)</td>
<td>2.168</td>
<td>.05</td>
</tr>
</tbody>
</table>

The t value of pre and postoperative cylindrical number after 6 weeks is 2.168 and p value is .05 which shows that there is a difference found in pre and post operative astigmatism after 6 weeks. (after suture removal). The mean of postoperative after 6 week cylindrical number is slightly high as compare to preoperative. 65% patients have with the rule astigmatism, 22% against the rule and 12.5% have oblique astigmatism.

Axis of post operative astigmatism after 6 week:

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid with the rule</td>
<td>22</td>
<td>55.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Against the rule</td>
<td>10</td>
<td>25.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Oblique</td>
<td>8</td>
<td>20.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

22 patients having with the rule astigmatism postoperatively and 10 patients having against the rule astigmatism postoperatively and 8 patients having oblique astigmatism postoperatively.

T-Test:

<table>
<thead>
<tr>
<th>Paired sample statistics</th>
<th>Mean</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1 Pre OP astigmatism</td>
<td>-1.1250</td>
<td>40</td>
</tr>
<tr>
<td>Post OP astigmatism after 1 day</td>
<td>-3.4738</td>
<td>40</td>
</tr>
</tbody>
</table>

The mean of preoperative cylindrical number is -1.1250 and the mean of postoperative cylindrical after a day is -3.4738. There is a great difference found in preoperative astigmatism and postoperative astigmatism after one day.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre OP Astigmatism-Post OP Astigmatism (40) after 1 day.</td>
<td>11.303</td>
<td>.000</td>
</tr>
</tbody>
</table>

In paired sample t test the t value of preoperative cylindrical number and postoperative cylindrical number is 11.303 and p value is .000 which shows
that there is great difference found in preoperative astigmatism and postoperative astigmatism after a day. And the data is statistically significant.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre OP Astigmatism- Post OP Astigmatism After 1 week</td>
<td>9.739</td>
<td>.000</td>
</tr>
</tbody>
</table>

The t-value of pre and postoperative cylindrical number after 1 week is .000 which is highly significant. This shows that there is a great difference of astigmatism found in pre and post operative astigmatism after one week. The astigmatism is high after one week of surgery as compare to pre operative astigmatism and data is highly significant.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre OP Astigmatism- Post OP Astigmatism After 6 week (immediately after suture removal)</td>
<td>2.168</td>
<td>.05</td>
</tr>
</tbody>
</table>

The t value of pre and postoperative cylindrical number after 6 weeks is 2.168 and p value is .05 which shows that there is a difference found in pre and post operative astigmatism in after 6 weeks. (after suture removal). Data is significant. The mean of postoperative after 6 week cylindrical number is slightly high as compare to preoperative cylindrical number.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post OP Astigmatism after 1 day Post OP Astigmatism After 6 week (immediately after suture removal)</td>
<td>10.704</td>
<td>.04</td>
</tr>
</tbody>
</table>

The t value of post operative cylindrical number after a day and after 6 weeks is 10.704 and p value shows that there is a significant difference between postoperative after a day and after 6 weeks.

Paired sample test:

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t-Value</th>
<th>P-Value sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post OP Astigmatism after 1 week Post OP Astigmatism After 6 week (after suture removal)</td>
<td>8.905</td>
<td>.000</td>
</tr>
</tbody>
</table>

The t value of postoperative astigmatism after 1 week and postoperative astigmatism after 6 week (after suture removal) is 8.905. and p value is .000 which shows that data is highly significant.

Axis of post op after 1 week

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid With the rule</td>
<td>26</td>
<td>65.0</td>
<td>65.0</td>
<td>65.0</td>
</tr>
<tr>
<td>against the rule</td>
<td>9</td>
<td>22.5</td>
<td>22.5</td>
<td>87.5</td>
</tr>
<tr>
<td>Oblique</td>
<td>5</td>
<td>12.5</td>
<td>12.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

65% patients have with the rule astigmatism,22% against the rule and 12.5% have oblique astigmatism.

Axis of post op after 6 week

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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<tr>
<td>Valid with the rule</td>
<td>22</td>
<td>55.0</td>
<td>55.0</td>
<td>55.0</td>
</tr>
</tbody>
</table>
DISCUSSION:

Astigmatism means unequal curvature of the refractive surfaces of the eye. Thus a point source of light cannot be brought to a focus on the retina but is spread over a more or less diffuse area. This results from the radius of curvature in one plane being longer or shorter than the radius at right angles to it. This study shows that when extra capsular cataract extraction surgery is done astigmatism occur. After surgery, changes in astigmatism occurred with the passage of time.

Post-operative keratometric astigmatism is mainly induced by sutures and suturing techniques. Several factors for surgically induced astigmatism have been identified, the most significant is tightness of the wound closure. Loosely closed wounds allow the cornea to flatten with reduced curvature in vertical meridian causing against the rule astigmatism while tight suturing lead to stretching of the cornea vertically increasing the curvature in vertical meridian and causing with the rule astigmatism.

Although this undesired postoperative astigmatism is a major reason for surgeons’ and patients’ dissatisfaction, but the gradual decline of astigmatism with passage of time and almost overcoming it after removal of sutures the results are not encouraging. This study shows that after 1st day and 1st week of surgery a large amount of astigmatism is induced as compare to preoperative astigmatism due to tightness of sutures but when sutures are removed after 6 weeks eye comes to its normal physiological position and astigmatism reduces a bit but still exist and more if sutures are tightened after 6 weeks the astigmatism becomes more tight but with the passage of time it decreases after suture removal but not fully reversed back to original. The axis remain mainly with the rule postoperatively.

CONCLUSION:

It is concluded that when extra capsular cataract extraction is done with interrupted sutures changes in astigmatism occur due to sutures tightness. But after 6 week it reverses a bit after suture removal but results of surgery was not satisfactory as astigmatism does exist after surgery as compare to pre operative astigmatism. The day after surgery the astigmatism become very high but with the passage of time it decreases after suture removal but not fully reversed back to original.

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14. RK Bansal, Amod Gupta, SPS Grewal Department of Ophthalmology, Postgraduate Institute of Medical Education & Research, Chandigarh 160 012, India.
17. University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria. Received;28 November 2010; revised paper accepted 16 May 2011
ABSTRACT:
Objective: To observe the association of low HDLc and Myocardial infarction.
Design: Cross sectional study.
Patients and methods: Patients from KPK coming for coronary angiography were analyzed for Lipid profiles and compared with normal control. Relationship of obesity and Dyslipidemia was also evaluated.
Results: Most of Patients with MI showed low abnormal HDLc (High density lipoprotein related cholesterol) levels \( n=79 \) (79%). while few of normal control individuals showed low HDLc level \( n=39 \) (39%). Odd ratio of MI to normal control for HDLc (5.88) is very significant. Most of obese individual with or without MI showed low HDLc levels \( n=35 \) (82.4%). The ratio TG/HDLc was greater than 4 in MI patients, a high risk factor.
Conclusion: MI can be avoided by controlling HDLc. There is significant association of low HDLc with obesity and DM.

INTRODUCTION
In clinical practice MI is thought to be best prevented and treated by controlling LDLc (low density lipoprotein related cholesterol) rather than HDLc. It is hard fact that dietary measures and drugs recommendations to decrease LDLc are much more available and successful than increasing HDLc. However there is significant association of Low HDLc (with normal LDLc) and MI. This type of dyslipidemia is specifically associated with obesity\(^{(10)}\). Other factors like diabetes, alcoholism, smoking, and rare diseases like Tangiers may be responsible for abnormal HDL levels. Tangiers disease is prevalent in island of Tangier, Europe and Asia. It is an autosomal recessive condition associated with defect in ABC 1 transporter. This transporter is responsible for efflux of cholesterol from cells to be taken as HDLc to the liver. It is considered a rare disease clinically characterized by big yellow tonsils and MI at young age. It is specifically associated with very low level <5 mg/dl in homozygote state. In heterozygote state just below normal level may be observed. How far this is prevalent in Asia needs study, in those patients, having no apparent cause for low HDLc. However this needs higher level study of transporter ABC1 in research laboratories.

Obesity has increased in the form of epidemic due to modern life style of higher intake in form of sweets and snacks. Obesity is defined in form of high BMI (body mass index) and WHR (waist hip ratio). BMI but not WHR is associated negatively with socioeconomic condition. WHR is a better indicator of obesity and associated with cardiovascular mortality. It is part of Metabolic syndrome\(^{(9)}\). Obesity related to stress as part of hypothalamic arousal syndrome is not appropriately considered. It is considered as consequence of neuro-endocrine deregulation\(^{(13)}\). Partial correlation analyses revealed that both fat mass and abdominal fat accumulation significantly contributed to VLDL-TG and HDL-CHOL variances\(^{(14)}\). Women with high WHR were found to have a number of symptoms of poor coping to stress\(^{(15)}\). It was therefore suggested that part of the background to this syndrome might be hypothalamic arousal syndrome developing with stress\(^{(16)}\). Obese women had significantly higher plasma levels of VLDL-TG, normal or high low density lipoprotein (LDL)-CHOL, LDL-TG, LDL-apolipoprotein (apo) B and reduced HDL-CHOL levels compared to non-obese controls (p less than 0.01)\(^{(17)}\).
profiles and compared with normal control. The total of 200 subjects were selected for this study, including 100 cardiac patients (Male 70 and Female 30) and 100 normal healthy individuals (Male 70 and Female 30) who did not have any coronary complaints like chest pain or exertional dyspnea. All these patients were also categorized as obese and of normal weight. Their ages ranged from 40-75 years with maximum number close to 50-60 years of age. Their routine history and physical examination was carried out. Special features targeted were smoking history, dietary history, alcohol intake, diabetic status, BMI and blood pressure. Those patients critically ill, with acute MI and non-willing were excluded from study. Controls were those who were absolutely free of ischemic (IHD) symptoms on exertion, normal ECG and ECHO.

RESULTS:
Most of Patients with MI showed low (abnormal HDLc levels n=79,79%), while few of normal control individuals showed low HDLc level (no=39,39%). Odd ratio of MI to normal control for HDLc (5.88) is very significant. (Table 1).
Most of obese individual with or without MI showed low HDLc levels (n=35,82.4%), while few of non obese individuals showed low HDLc level no= (13,34.21%). Odd ratio of HDLc in obesity is also high (8.92) and hence significant. (Table 2)
High LDL was more( n = 31,31% ) in control group than in MI group ( n = 59,59%) .Most of n=(28 ,68.2%) obese patients showed high triglycerides. However 13 obese patients (31.8%) showed normal triglycerides. Most(n=29, 67.8%) of normal weight individuals showed normal triglycerides. However some control individuals (n=9,32.2%) showed high triglycerides level.
TG/HDLc is a well-known atherogenic index. A value of greater than 4 is highly atherogenic. In this study it was high (>4.5) in MI patients than normal control (<3) (Table 3). One patient with normal lipids (HDLc, LDLc) and non-smoker status when evaluated was found to have high triglycerides, so the ratio TG/HDLc was greater than 4,a high risk factor for IHD.

Table 1 : HDLc level in MI and control patients

<table>
<thead>
<tr>
<th>Abnormal HDLc (LOW)</th>
<th>Normal HDLc (HIGH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with MI</td>
<td>79</td>
</tr>
<tr>
<td>Control without MI</td>
<td>39</td>
</tr>
</tbody>
</table>

Odd Ratio OD = a x d / b x c = 79 x 61 / 39 x 21=5.88

Table 2 : HDLc level in obese and normal weight individuals

<table>
<thead>
<tr>
<th>No of obese individuals</th>
<th>No of normal weight individuals</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal HDLc (LOW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI 30 &amp;above</td>
<td>35 (85.4 %)</td>
<td>13 (34.21 %)</td>
</tr>
<tr>
<td>Normal HDL c level</td>
<td>6 (14.6%)</td>
<td>25 (65.78 %)</td>
</tr>
</tbody>
</table>

Odd ratio For HDLc with obesity is a x d / b x c = 35 x 25 /39x8 =8.92

Table 3 : Lipid profile in MI patients and control

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients (n=100)</th>
<th>Control(n=100)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean+SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal HDLc level</td>
<td>6 (14.6%)</td>
<td>25 (65.78 %)</td>
<td>P= &lt; .5 %</td>
</tr>
</tbody>
</table>

TG/HDLc =166.91/37.7 = > 4.5 For MI patients =136.83/52.9 = < 3.0 For Non MI(control)

DISCUSSION:
This study showed That MI is more related to low HDLc (abnormal) than high LDLc. This result support other studies by Protanne Lences de Luz et. al[6], Michael Gaziano etal[2] and by Lozano J V et-al[7] where low HDLc as well TG/HDLc ratio was positively correlated with coronary artery disease. This study also showed high TG/HDLc ratio > 4.5 in MI as compared to low ratio of <3 in non MI control. TG/HDLc ratio of >4 is highly atherogenic index, a well known established parameter[2](6). Other studies by Holmes MV etal[3] and by Benjamin F Voight et al[1] show that the relation of HDLc and MI is less certain. Normal LDLc in most MI patients is due to the fact being on statin drugs.

Obesity weather by BMI or WHR criteria is typically associated with high triglyceridemia and low HDLc. LDLc may be high or normal. Fat stores now considered as endocrine organs are doing much more than as passive depot store of energy. The real traffic of fatty acids between various tissues is still not well understood. Triglyceridemia is multi factorial. Diet[21] genetics[22] has great influence on it, therefore considerable non obese have triglyceridemia. What free fatty acid perform as pro-inflammatory role is still under active discussion. In this study obese individuals showed typical abnormal HDLc with normal /abnormal LDLc as compared to non obese individuals. This is according to other studies by Ettinger etal[5].One study by Chehrei A etal[9] has shown weak correlation between obesity and HDLc but strong correlation with TG.
A significant number of non obese individual (n=13 44%) showed abnormal HDLc level. This has also been shown by a well known study by Michael Miller (23) The possibility of heterozygote ABC 1 transporter defect cannot be excluded. Possibility of homozygote ABC1 transporter defect is clinically excluded by absence of typical big tonsils in these cases.

CONCLUSION
There is significant association of obesity and dyslipidemia. Measures are needed to prevent obesity and also to correct dyslipidemia in obesity with drugs like Statin and Nicotinic acid. Fibrates and Estrogen also are choices (8) However role of nicotinic acid is not beneficial in another study by Remirez and P P Hu(4). Much more drugs are needed to correct HDLc, as few drugs are available to correct it than LDLc. Avoiding excessive alcohol use, smoking and controlling Diabetes is also anti-lipidemic .These increase HDLc and decrease TG. Higher level studies are needed to explore ABC1 transporter defect in Asian populations like cholesterol efflux study in macrophage in vitro.

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The Efficacy of Zinc as an Adjuvant Therapy in the Treatment of Severe Pneumonia

S. Imad Ali Shah FCPS, Zia-ur-Rehman FCPS, Abdul Khaliq FCP.

ABSTRACT
Objective: To determine the efficacy of zinc as an adjuvant therapy in the treatment of severe pneumonia in children below 2 months to 1 years of age.

Study Design: Static experimental study.

Place and duration of study: Department of Child Health, Khyber Teaching Hospital, from June 2013 to November 2013.

Methodology: A total of 196 patients were selected and divided in two equal groups with 98 patients in each group, half of them were given standard treatment of pneumonia with zinc (group A) and the other half received only standard treatment and no zinc (group B). Lower chest wall in drawing, respiratory rate and oxygen saturation at room air was observed after 48hrs and results were documented.

Results: In group A, 93% Children had no chest wall in drawing after 48hrs of treatment while in group B, 85% of children had no chest wall in drawing with a P-value of 0.004 which was statistically significant. In terms of respiratory rate, 38.3% had respiratory rate <50/min after 48hr treatment in group A, while it was 36.7% in group B with a P-value of 0.76 which was not statistically significant. Oxygen saturation was >95% in 86.7% of children in group A, compared to 77.5% in group B with p-value of 0.09.

Conclusion: Our study concludes that zinc as an adjuvant is effective in clinical improvement of severe pneumonia in terms of chest wall in drawing but has no statistically significant effect in terms of decreasing the respiratory rate and improving oxygen saturation after 48hrs of treatment.

Key words: efficacy, zinc, severe pneumonia, chest in drawing, respiratory rate, oxygen saturation.

INTRODUCTION
Pneumonia is inflammation of the parenchyma of the lungs. Childhood pneumonia is one of the leading causes of mortality in children aged less than 5 years. The incidence in this age group is estimated to be 0.29 episodes per child-year in developing and 0.05 episodes per child-year in developed countries. This translates into about 156 million new episodes each year worldwide, of which 151 million episodes are in the developing world. Most cases occur in India (43 million), China (21 million) and Pakistan (10 million), with additional high numbers in Bangladesh, Indonesia and Nigeria (6 million each) with streptococcus pneumoniae, haemophilus influenzae and respiratory syncytial virus as the main pathogens associated with childhood pneumonia. World Health Organization has estimated that each year pneumonia kills up to 2.4 million children, which accounts for 19% of all deaths in the under-five agegroup.

While much emphasis is placed on protein-energy status and vitamin A, it has been proposed that zinc has a real potential in the prevention of pneumonia morbidity and mortality. Zinc modulates host response to infection by improving skin and mucous membrane barriers, leukocyte function and cytokine expression. Children with good zinc status have a more robust immune response whereas low plasma zinc concentration has been found to be associated with a greater susceptibility to infections.

Chest in drawing is statistically significant with beneficial effects of zinc. It should be given as adjuvant therapy to all the patients of severe pneumonia. The role of zinc needs to be studied more comprehensively.

There have been few studies showing that Zinc-supplemented children have lower rates of diarrhea and pneumonia in comparison with children not given zinc supplementation, as reduced the incidence of acute lower respiratory tract infections by approximately 15%. Still there are some studies, which do not show any clear-cut superiority of zinc in management of pneumonia. There are no local studies about the role of zinc in pneumonia and with this study we will try to highlight the role of Zinc in terms of its efficacy by comparing the different parameters of sever pneumonia in the two groups of children. WHO also recommends...
The Efficacy of Zinc as an Adjuvant Therapy in the Treatment of Severe Pneumonia

further studies in this regard too.\textsuperscript{8}  

\textbf{METHODOLOGY:}  

This study was conducted in Department of Child Health, Khyber Teaching Hospital, Peshawar. It is one of the major tertiary care teaching hospital in Khyber Pakhtunkhwa and second largest in Peshawar. It is a 1200 bedded hospital with two Paediatrics units with 100 beds and a 50 bedded nursery. It caters for about 500,000 patients a year from all over the country. Approval of the study was obtained by institutional research and ethical committee before starting this study. The purpose and benefits of the study was explained to the parents of the baby, they were explained that all the information will be confidential and this study was designed purely for data review and publication purpose and a written informed consent was obtained.

In our study we took all children 2 months to 1 year of age, of either gender with severe pneumonia having respiratory rate >50 per minute and having severe chest wall in drawing and inability or poor feeding.\textsuperscript{9} Children having congenital heart disease, congenital lung disease, aspiration pneumonia, history of recurrent cough and wheeze and severe malnutrition were excluded.

Our study was a static experimental study. The duration of our study was 6 months from June 2013 to November 2013. A total of 200 patients were selected according to eligibility criteria from which 4 refused. The remaining 196 were enrolled and divided into two equal groups with 98 in each group with the power of the test 80%, level of significance 5%, anticipated population proportion P1=4.08 and P2=14.29. Group A comprising of children who received standard treatment of pneumonia with zinc and Group B received standard treatment for pneumonia but without Zinc.

Patient’s demographic characteristics were noted including name, age, sex and address. All the information was extracted from the parents in full privacy and patient were put on standard treatment for pneumonia. Before starting the therapy, the time was recorded. Children were randomly allocated in two groups by lottery method. Children in Group A received 20 mg elemental zinc per day (20 mg zinc per 5 ml syrup) as sulphate plus standard antibiotics according to WHO guidelines for severe pneumonia.\textsuperscript{3} Children in Group B were put only on same antibiotics but without Zinc. Three nurses were trained in this regards. All the children were constantly monitored for resolution of symptoms every 8 hourly till the resolution of all the symptoms related to pneumonia. Children would be observed for at least another 24 hours after the resolution of signs and symptoms of pneumonia. All the above mentioned data was recorded in a predesigned proforma and strict exclusion criteria was followed so as to control confounders and bias in the study results.

Patients who failed to improve after 48 hrs of antibiotics or whose condition worsened, their antibiotic would be changed to second line antibiotics according to WHO guidelines.\textsuperscript{4} Failure to improve or worsening condition had established clinically by worsening of symptoms.

Data analysis procedure: Data was analyzed using SPSS version 16. Mean $\pm$ Standard deviation were calculated for continuous variables like age. Frequencies and percentages were calculated for categorical variables like gender. Our Main Outcome Measure was to determine the difference in the proportion of patients in either group in achieving no chest wall in drawing. Chi Square test was applied to determine the difference in the proportion of patients between the two groups keeping the p-value of ≤0.05 for statistical significance. Stratification with respect to age and gender was done post stratification chi square test was applied. P <0.05 was taken as significant value.

\textbf{RESULTS:}  

A total of 196 children were observed to measure the efficacy of zinc as an adjuvant therapy in the treatment of severe pneumonia in children between 2 months to 1 years of age and the result were analyzed as:

- Age distribution among two groups was analyzed as in Group A 22(22%) children were in age range 2-5 month, 43(44%) children were in age range 6-9 month and 33(34%) children were in age range 10-12 month. Mean age was 8 months ± 1.26 where as in Group B 20(20%) children were in age range 2-5 month, 44(45%) children were in age range 6-9 month and 34(35%) children were in age range 10-12 month. Mean age was 9 months ± 1.78.
- Gender distribution among two groups was analyzed as in Group A 59(60%) children were male and 39(40%) children were female. Where as in Group B 62(63%) children were male and 36(37%) children were female.
- Status of lower chest wall in drawing after 48 hours among two groups was analyzed as with zinc adjuvant, lower chest in drawing was present in 77(77%) children and was absent in 91(93%) children. Whereas without zinc adjuvant lower chest in drawing was present in 15(15%) children and was absent in 83(85%) children. (as shown in Table No. 1)
- Efficacy in term of absence of lower chest wall in drawing after 48 hours among two groups was analyzed showing statistically significant results with zinc adjuvant therapy compared to no added zinc with a p-value 0.018. But the results were not statistically significant in terms of improvement in respiratory rate with p-value 0.76 and oxygen saturation with p-value.
of 0.09 (as shown in Tables No.1.2.3)
Stratification of efficacy with age and gender is given in table no 4,5.

TABLE NO 1. Lower chest wall in drawing after 48 hours(n=196)

<table>
<thead>
<tr>
<th>LOWER CHEST WALL INDRAWING</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>7(7%)</td>
<td>18(15%)</td>
</tr>
<tr>
<td>Absent</td>
<td>91(93%)</td>
<td>80(85%)</td>
</tr>
<tr>
<td>Total</td>
<td>98 (100%)</td>
<td>98 (100%)</td>
</tr>
</tbody>
</table>

Chi square test is applied in which p-value is 0.018

TABLE NO 2. Respiratory rate at the end of 48hrs (n=196)

<table>
<thead>
<tr>
<th>RESPIRATORY RATE</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50/MIN</td>
<td>60(61.2%)</td>
<td>62(63.2%)</td>
</tr>
<tr>
<td>&lt;50/MIN</td>
<td>38(38.3%)</td>
<td>36(36.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>98 (100%)</td>
<td>98 (100%)</td>
</tr>
</tbody>
</table>

Chi square test is applied in which p-value is 0.76

TABLE NO 3. Pulse oxymetry reading after 48hrs (n=196)

<table>
<thead>
<tr>
<th>OXYGEN SATURATION</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95%</td>
<td>85(86.7%)</td>
<td>76(77.5%)</td>
</tr>
<tr>
<td>&lt;95%</td>
<td>13(13.2%)</td>
<td>22(22.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>98 (100%)</td>
<td>98 (100%)</td>
</tr>
</tbody>
</table>

Chi square test is applied and p-value is 0.09

TABLE NO 4. Stratification of efficacy with age distribution

<table>
<thead>
<tr>
<th>AGE</th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 months</td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>Not Effective</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>21</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>6-9 months</td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>Not Effective</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>39</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>10-12 months</td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>Not Effective</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>31</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>34</td>
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</tr>
</tbody>
</table>

TABLE NO 5. Stratification of efficacy with gender distribution

<table>
<thead>
<tr>
<th>GENDER</th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>Not Effective</td>
<td>5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>54</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>62</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Our study shows that mean age in Group A was 8 months ± 1.26 whereas mean age in Group B was 9 months ± 1.78. In Group A 60% children were male and 40% children were female. Whereas in Group B 63% children were male and 37% children were female. In zinc adjuvant group, lower chest in drawing was present in 7% children and was absent in 93% children. Whereas without zinc adjuvant lower chest in drawing was present in 15% children and was absent in 85% children. So zinc adjuvant group was effective in 93% children whereas without zinc adjuvant was effective in 85% children. While the effects on respiratory rate and oxygen saturation were better but not statistically significant between the two groups.

In a study conducted by Bhutta et al although zinc was efficacious in boys, the overall effect as well as the interaction between gender and zinc administration was not statistically significant. Inherent differences in the populations studied and differences in the illness characteristics including pre-enrollment duration and definition of recovery would explain the discrepancy between studies. Another study conducted by Brooks et al, a double-blind placebo-controlled clinical trial in Matlab Hospital, Bangladesh, 270 children aged 2–23 months were randomized to receive elemental zinc (20 mg per day) or placebo, plus the hospital’s standard antimicrobial management, until discharge. The group receiving zinc had reduced duration of severe pneumonia, including duration of chest in drawing, respiratory rate more than 50 per min and hypoxia and overall hospital duration. All effects were greater when children with wheezing were omitted from the analysis.

In another study conducted by Ehsan V. Alvi in 2010, in this study, 128 children (3–60 months old) admitted to the hospital with severe pneumonia were randomly divided into 2 groups (64 in each) that received either zinc sulfate (2 mg/kg/d, maximum 20 mg in 2 divided doses, for 5 days) or a placebo, along with the standard antimicrobial therapy. Primary outcome measurements included the time taken for clinical symptoms of severe pneumonia such as fever and respiratory distress symptoms to resolve, and the secondary outcome included the duration of hospital stay. The time taken for all the symptoms to resolve in the zinc-supplemented group was significantly lesser then that in the placebo group.
Another study conducted by Dilip Mahalanabis et al., a controlled trial with a factorial design, 153 children aged 2-24 mo who were hospitalized with severe ALRI were randomly assigned to receive 10 mg zinc as acetate (twice daily for 5 d) plus vitamin A placebo, 10 000 μg retinol equivalents vitamin A (twice daily for 4 d) plus zinc placebo, zinc plus vitamin A, or zinc and vitamin A placebos. The main outcome variable was the time for resolution of very ill status; other outcomes were resolution of fever, tachypnea, and feeding difficulty. Recovery rates from very ill status and from fever in zinc-treated boys were significant than those in non-zinc-treated children, feeding difficulty and tachypnea were not significantly different between groups after an adjusted analysis. The high proportion of children with first wheezing episode is a limitation of our study, a finding likely due to use of WHO criteria in defining severe pneumonia. This definition has high specificity for severe lower respiratory tract infection but does not define the etiology. Secondly, severe pneumonia includes a wide spectrum of causative organisms from viral to fungal which may respond differently to zinc administration. Furthermore, this heterogeneity can also result in poor specificity of the outcomes, which again may dilute a measureable effect of zinc. Thirdly, serum zinc levels were not measured in our study because of financial concerns and low zinc level might be the cause of poor response to therapy in some children. Also chest x-ray was not used as a primary diagnostic tool but when used to improve the diagnosis enabled us to identify only 46% with radiographic pneumonia. It is also noteworthy that there was significant beneficial effect of zinc in this subgroup. Future studies are needed exploring the role of zinc in severe pneumonia in which children with wheezing are excluded and CXR, microbiologic, and inflammatory markers are used in an attempt to arrive at a more specific diagnosis.

CONCLUSION

Our study concludes that zinc as an adjuvant is effective in clinical improvement of severe pneumonia in terms of chest wall in drawing but has no statistically significant effect in terms of decreasing the respiratory rate and improving oxygen saturation after 48hrs of treatment.

REFERENCES

Effectiveness of Circuit Class Training vs. Individual Task Specific Training on Lower Limb Strength Post-stroke Cases

(Rabia Basri DPT1, Umar Hayat FCPS (ortho)2, M. Sajjad Ali Khan FCPS(Med)3)

ABSTRACT

Background and purpose: Task specificity and its progression are the key variables in acquiring motor skills after stroke and reported consistently with significant results when carried out at individual level. Due to number of benefits associated with circuit trainings, it’s getting popular for stroke rehabilitation as alternative approach to individual based trainings.

Objective: To examine the effectiveness of circuit class training vs. individual task specific training on lower limb strength in post stroke.

Study Design: Single blinded randomized controlled trial.

Interventions: Total n=64 participants randomly allocated into two groups using the simple random sampling, circuit group n=32 and individual group n=32. The both group received task specific training individually for 1.5 hour daily for 5 days per week for 4 weeks. The circuit group received task specific training in circuit while the individual group received the task specific training one by one. Total n=2 subjects left the study with mentioned domestic problems.

Main measures: The isometric muscle testing of lower limb was done by hand held dynamometer, the testing of the functional parameters was done by modified Motor Assessment Scale (MAS), 6 Minute Walk Test (6MWT) and by Time up and Go Test (TUGT).

Result: Muscle strength significantly improved in both the groups after 4 week training program( P<0.01, Paired sample t-test) except ankle strength that was not significantly improved in individual group ( P>0.01, Paired sample t-test). Among the functional measures both the groups reported significant improvement on MAS (P<0.01, Paired sample t-test) also the circuit group reported for significant improvement on 6MWT and on TUGT (P<0.01, Paired sample t-test) but the individual group didn’t improved on 6MWT and on TUGT test after 4 week training (P>0.01, Paired sample t-test). The between group analysis suggested a significant improvement for circuit group over muscle strength, MAS, 6MWT and for TUGT (P<0.01, ANOVA). The gain in strength was significantly associated with all functional measures (P<0.01, Pearson correlation test).

Conclusion: The circuit class training can improve lower extremity muscle strength among stoke patients better than individual task specific training and could carry this improvement into functional abilities.

Key words: Circuit class training, individual task specific training, Physiotherapy after stroke, Motor assessment scale, Rehabilitation after stroke.

INTRODUCTION:

Stroke defined by WHO as “rapidly developing clinical signs of focal or global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin”[1]. Stroke is the major public health concern and is the 2nd leading cause of death which accounts for about 11% of all deaths worldwide[2]. Reported by WHO about 85% of all deaths due to stroke occurs in under-developed countries, while in developed countries, its mortality rate has been declined since 1990.[3] Age increases the risk of stroke as ¼ of all strokes occurs after age of 65 years[4]. Approximately 80-90% stroke results in muscular weakness at least in one limb and it has been reported that half of stroke sufferers persist with motor impairment even after 6th month of stroke attack[5].

The circuit class training can improve lower extremity muscle strength among stroke patients better than individual task specific training and could carry this improvement into functional abilities.

Muscular strength has been considered as the significant predictor of walking abilities post stroke and several studies suggested that reduced endurance and reduced walking abilities post stroke strongly associates with muscular weakness[6]. Moreover lower extremity impairments are the risk factor for fall, nursing care admissions and mortality. These all has been attributed to reduced size of muscle fiber, reduced firing rate, altered motor unite recruitment and due to decreased
motor unite numbers post stroke[7].

Progressive strength training refers to the progressive increase in resistance applied to the muscles as strength training induce greater ability to muscles to produce and sustain force. The key elements of such kind of training are to provide sufficient resistance, in a progressive way and for a sufficient duration of time [8]. There is mounting evidence that the progressive strength training post stroke is effective in improving muscular strength[9]. Previously it had been used successfully to restore functions in older adults with chronic diseases other than stroke[6,10].

Current approaches for stroke rehabilitation, now emphasis for Task Specific Training (TST) as essential component. TST is based on motor relearning theory which trains whole sequence of the activity rather that individual component of the activity[11-12]. Motor relearning theory suggests that the positive cortical reorganization occurs in human cortex with repetitive practice of new task that ultimately leads to recovery of functional activities[13].

The decline of ongoing exercise programs after discharge from rehabilitation centers might be major oversights in post stroke management, that can be exacerbate disability after stroke. As many investigators reported that stroke sufferers did not carry over the functional gains after cessions of rehabilitation programs[14]. Exercise program involving classes or groups are one way to maintain or improve the individuals with functional activities post stroke. This kind of group training is advantageous for a reason that they not only provide the opportunity for social interactions and saving time of the therapist as many individuals performs activity at the same time but it’s also cost effective for the health system. According to Car and Shepherd, these classes or groups can be organized into circuits with a series of workstations designed to strengthen the affected muscles appropriately to provide the opportunity for maximum repetition of task[15].

There is established evidence for circuit trainings for improving mobility and balance in post-acute and chronic stroke over individual training programs[16-17]. Improved mobility with circuit trainings could translate its effects over muscle strength but however a limited number of researches directly investigated the effects of circuit class training on muscle strength post stroke[18-20], also its reported that gain in strength cannot cause respective functional improvement[21]. The methodological shortcoming, small sample size and non-random allocation in these studies along with inconsistent results about effectiveness of circuit trainings created the need for a study to be conducted in that similar investigated area with best targeting the aforementioned shortcoming.

METHODS:

Simple random sampling technique was carried out for this study. Total 64 patients were recruited and treated at physiotherapy department of Fauji Foundation Hospital Peshawar and Rafsan paraplegic setting, and KMU clinic while the patients from other setups were invited for the study by their respective therapist if needed treatment and considered eligible. The subjects recruited for this study on the basis of following inclusion and exclusion criteria. Inclusion criteria was 1) 1st stroke attack with unilateral hemiplegia 2) subjects between 3rd to 8th month of stroke attack 3) Manual muscle testing reported > 1 power for lower limb 4) individual with well cognitive status. Exclusion criteria was 1) pain in lower limb reported >3 on visual analogue scale 2) any medical condition that contra-indicates participation in group 3) patients previously received physiotherapy sessions 4) history of significant psychiatrist illness. The subjects were given a booklet as used by Courtesy of F Mackey physiotherapy department with modifications according to this study. The subjects were given the informed consents based on Helsinki ethical considerations.

Design: A single blinded randomized clinical trial design was used with 4 weeks follow up. All the subjects that included in the study were evaluated for baseline measurement and randomly allocated into 2 groups on arrival by a lottery method. Total n=2 subjects from each group with drew the study, due to their domestic problems.

Intervention: Subjects of both groups participated in 1.5 hour task specific training program for 5 days for 4 weeks. The individual group (also called control group) received the task specific training individually and subjects in the circuit group (also called experimental group) received the same treatment in circuit groups, with the series of different workstations appropriate to functional level of patients and they progressed accordingly. The workstations in this study were designed to improve the strength of lower limb muscles. These workstations were 1) exercises with thera-bands 2) lower limb coordination activities 3) exercise training with different weights 4) stepping backward, forward and sideways 6) ROM exercises 7) electrical stimulations if needed 8) sit/stand from different chair heights 9) balance training e.g., narrow base of support standing, tandem stance etc 10) strengthening with traditional gymnasium 11) gait training e.g. walking on slopes, over obstacles etc.
Outcome measures: The outcome measures were recorded at two occasions 1) at baseline and 2) after 4 week training program. These measurements were carried out by independent assessor who was blind to study.

There were four outcome measures in this study, Isometric muscle strength testing, Modified Motor assessment scale (MAS), 6 Minute Walk Test(6MWT) and Time Up and Go Test (TUGT).

Muscle strength: The isometric power of lower extremity muscles was evaluated by Hand Held Dynamometer. The muscles were tested in a group including hip flexors and extensors, knee extensors and flexors, ankle flexors (dorsi-flexors) and extensors (planter flexors). During testing the patients were asked to exert maximum force and dynamometer was held stationary by the therapist. The hip flexors and knee extensors were tested in sitting position and hip extensor, knee flexors and ankle planter flexors were tested in prone position while the ankle dorsi-flexors were tested in supine position.[20]

Modified Motor assessment scale MAS: The MAS was used for measuring functional activities including balance as well. Here it’s called a Modified MAS because the upper limb parameters being excluded from MAS for this study. MAS developed by Carr et al. to evaluate functional ability skills after stroke. It uses a 9 point ordinal scale. This instrument has revealed high test re test consistency(r=0.98), inter-rater reliability(r=0.95) with high construct validity (0.88 correlated with Fugal Meyer assessment).[22]

6minute walk test MWT: 6MWT was used in this study to measure the walking endurance of stroke subjects. That was actually a measurement of distance covered in 6 minutes by subjects. The total distance covered was counted by floor markers. The subjects were allowed to use aid during walk. This test has been demonstrated with 0.99 intra-rater coefficient for stroke subjects.[23]

Time up and go test: This test is the lower limb functional test, which also determines the overall mobility of patients. The subjects were asked to stand up from the chair walk 3 meter with turn around and sit back to the chair. This test has been documented with high intra-rater reliability[20].

Statistical analysis: The means or proportion for all clinical characteristic were computed for this study, and all data variables were expressed as means and + standard deviations. The within group analysis was carried by paired sample t-test and between group analysis was done by one way analysis of variance (ANOVA). The Pearson correlation co-efficient was used to determine the correlation of change in strength after treatment with functional tests that were MAS, 6MWT and TUGT for all subjects. The analysis was done using SPSS version 21.

RESULTS:
Demographic characteristic of subjects: Baseline demographic characteristic of subjects are given in a Table 1:

Which indicates group means and standard deviations for age, 1st physiotherapy visit post stroke and mean length of hospital stay LOHT. The gender of subjects and involved hemi paretic sides are also given in the table 1. The means for age, 1st physiotherapy visit and for LOHS was almost same in both groups also there seem almost equal distribution of male and female in both groups. The lefts hemiplegics were more as compare to right hemiplegics in both groups.

Muscle strength: At baseline the means for the both groups were similar regarding muscle strength that was measured by the hand held dynamometer. Lower extremity muscle strength significantly improved in both groups for all muscle groups (paired t-test, P<0.001) except ankle dorsiflexors and planter flexors as their strength were not improved in control group (29.1 vs. 28.6 baseline and after respectively for ankle dorsiflexors) (paired t-test, P>0.001) and (33.8 vs. 34.0 baseline and after respectively for ankle planter-flexors) (paired t-test, P>0.001) after 4 week training program. The mean difference of pre and post training scores for all muscles groups strength suggests a significant improvement of study group over the control group (P<0.01, ANOVA)(table: 2).

Modified Motor Assessment Scale: At baseline the means for modified MAS were 14.63 and 14.40 respectively for control and study group. The after treatment means
were 18.77 and 20.22 respectively for control and study group that was significant improvement over 4 week training program in both groups (P<0.001, paired sample t-test). The mean difference of pre to post training scores for MAS was -4.21 vs. -6.23 respectively for control and study group. The between group analysis showed a significant improvement of study group over control group (P<0.001, ANOVA) (table: 2).

**6 minute walk test MWT:** At baseline the means for 6MWT were 335.0 and 334 respectively for control and study group. The after treatment means were 339.3 and 362 respectively for control and study group which was a significant improvement for study group (P<0.001) but not for the control group (P>0.001, paired sample t-test). The mean difference of pre to post training scores for 6MWT showed a significant improvement of study group over control group (6.3 vs. 41.0 respectively, P<0.001, ANOVA) (table: 2).

**Time up and go test TUGT:** At baseline the means for TUGT were 23.87 and 23.27 respectively for control and study group. The after treatment means were 23.13 and 16.67 respectively for control and study group which was a significant improvement for study group (P<0.001) but not for the control group (P>0.001, paired sample t-test). The mean difference of pre to post training scores for TUGT were -1.26 and 6.60 respectively for control and study group with a significant improvement of study group over control group (P<0.001, ANOVA) (table: 2).

**Table 1:** Baseline demographic characteristic

<table>
<thead>
<tr>
<th>Variables</th>
<th>Circuit group</th>
<th>Individual group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF</td>
<td>35.45(2.5)</td>
<td>47.6(3.7)</td>
</tr>
<tr>
<td>HE</td>
<td>34.5(15.6)</td>
<td>45(4.5)</td>
</tr>
<tr>
<td>KF</td>
<td>25.45(3.5)</td>
<td>37(2.7)</td>
</tr>
<tr>
<td>KE</td>
<td>14.45(2.5)</td>
<td>24(3.7)</td>
</tr>
<tr>
<td>AD</td>
<td>29.1(10.8)</td>
<td>28.6(12.6)</td>
</tr>
<tr>
<td>AP</td>
<td>33.8(15.6)</td>
<td>34.0(12.6)</td>
</tr>
<tr>
<td>MAS</td>
<td>14.63(1.84)</td>
<td>18.77(1.9)</td>
</tr>
<tr>
<td>TUGT</td>
<td>23.87(12.4)</td>
<td>23.13(4.19)</td>
</tr>
<tr>
<td>6MWT</td>
<td>335.0(79)</td>
<td>339.3(126)</td>
</tr>
</tbody>
</table>

**Table 2:** Muscle strength, MAS, TUGT and 6MWT for both groups (Paired sample t-test and ANOVA)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group n=30</th>
<th>Experimental group n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>Baseline</td>
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</tr>
<tr>
<td></td>
<td>HF</td>
<td>35.45(2.5)</td>
</tr>
<tr>
<td></td>
<td>HE</td>
<td>34.5(15.6)</td>
</tr>
<tr>
<td></td>
<td>KF</td>
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<td></td>
<td>KE</td>
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<tr>
<td></td>
<td>AD</td>
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<tr>
<td></td>
<td>MAS</td>
<td>14.63(1.84)</td>
</tr>
<tr>
<td></td>
<td>TUGT</td>
<td>23.87(12.4)</td>
</tr>
<tr>
<td></td>
<td>6MWT</td>
<td>335.0(79)</td>
</tr>
</tbody>
</table>

**Table 3:** Pearson correlation between muscle group and functional tests

<table>
<thead>
<tr>
<th>Strength of the muscle group</th>
<th>MAS</th>
<th>6MWT</th>
<th>TUGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip Flexors</td>
<td>0.1</td>
<td>0.8</td>
<td>-0.9</td>
</tr>
<tr>
<td>Hip Extensors</td>
<td>0.8</td>
<td>0.8</td>
<td>-0.8</td>
</tr>
<tr>
<td>Knee Flexors</td>
<td>0.7</td>
<td>0.7</td>
<td>-0.9</td>
</tr>
<tr>
<td>Knee Extensors</td>
<td>0.7</td>
<td>0.5</td>
<td>-0.7</td>
</tr>
<tr>
<td>Ankle Dorsi-flexors</td>
<td>0.5</td>
<td>0.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>Ankle planter flexors</td>
<td>0.6</td>
<td>0.4</td>
<td>-0.3</td>
</tr>
</tbody>
</table>
Effectiveness of Circuit Class Training vs. Individual Task Specific Training on Lower Limb Strength Post-stroke Cases

Table 4 shows the results of Pearson co-relation analysis that demonstrated the relationship between changes in muscular strength with changes in functional measures. The table indicates the strongest relationship of changes in hip and knee muscle groups with functional measures that were MAS, 6MWT and TUM=male, F=female, SD=standard deviations, LHP= left hemiparesis, RHP= right hemiparesis, LOHS=length of hospital stay. Paired sample t-test

\[ \text{ANOVA} \]

HF=hip flexors, HE=hip extensors, KF=knee flexors, KE=knee extensors, AD=ankle dorsi-flexors, AP=ankle planter-flexors.

DISCUSSION:

Our findings are in favor of task specific training in circuits during stroke physiotherapy rehabilitation hypothesized for this study. The subjects from both groups made significant improvement in lower limb muscle strength after strengthening exercises that were task based but however the TUGT, 6MWT and ankle planter flexors and dorsi-flexors strength were not significantly improved in control group. The largest between group treatment differences were found for ankle joint strength, TUGT and 6MWT after the 4 week interventional period also this study showed that the gain in muscle strength is significantly associated with improvement in functional measures.

The results of both this study are in consistent to Pang et al.\cite{24}, whom also favored lower limb strengthening in circuit groups than in individual training program. But however the Mead et al.\cite{25} reported the equal effectiveness for both the treatment programs. The previous studies also identified that major impact of task specific training is on 6MWT (Salbach et al.,\cite{26} and Blennershasset et al.,\cite{27}). The non significant improvement of task specific training individually on ankle strength can be due to a reason that improving ankle strength requires more repetition and more time frame recovery compared to proximal joints of lower limb. The dynamic balance, measured through TUGT and through 6MWT, which was improved in study group, may reduce risk of fall among those elderly, as elderly population are at high risk of fall (Shumway-Cook et al.). The future studies should be conducted on balance training in circuits with associated risk of fall among such population. The factors that may influence recovery after stroke can be age, gender, side of hemiparesis, time of stroke onset and length of hospital stay, to eliminate these biases, the subjects were evaluated for these parameters baseline and both the group were found to be similar on these parameters, therefore the circuit training effects demonstrated in this study are likely to reflects the efficacy of circuits implemented in this study. Also this study excluded the any medical condition that could affect the participation in group nature of treatment e.g. Aphasia or cognitive problems but however due to a number of benefits associated with circuit trainings, the patients with minor cognitive problems and aphasic patients are now under research for such kind of treatment\cite{28}. Previous studies documented that chronic stroke sufferers can improve their functional performances well following group based task specific trainings.\cite{13} It was assumed that the group nature of therapies might help fatigue and depression in stroke patients\cite{29} also a study done by Zanker et al.\cite{30}, reported for active involvement of patients in group treatment and they also reported for high patients satisfaction with group nature of treatment. It is interesting that peer support and social interaction in group nature of treatment motivates patients for better performance as Zanker et al., reported that some patients in their study preferred for group therapy rather for taking therapy session alone and individually. As the patient satisfaction evaluated by studies, there is need to evaluate the staff or therapist perception\cite{27} for implementing the circuit trainings in stroke centers as the process of implementing CCT itself was challenging in this study as barriers comes for implementing new therapy models but detailed booklet information regarding circuit training to both patients and stroke centers assisted this process.

Study limitations: The sample size was not calculated for this study through a proper scientific method also there was lack of long term follow up to speculate whether these functional gains can be maintained in long run or not. Future studies need to be conducted the long term benefits of circuit trainings in stroke subjects.

CONCLUSION:

The circuit class training can improve lower extremity muscle strength among stroke patients better
than individual task specific training and can carry this improvement into functional abilities as well.

REFERENCES
Outcome of Lateral vs Cross Pinning in Supracondylar Humerus Fractures in Children

Umar Hayat FCPS (Orth)¹, Sohrab Ali MSc (Stats) MPH ², Shaukat Hayat MBBS³

ABSTRACT

Background: Supracondylar humerus fractures are one of the most common fractures in children. Closed reduction under general anesthesia and placement of 2 or more wire from lateral side is the most commonly performed procedure. The objective of this study was to determine the outcome of lateral only pins in the operative management of supracondylar fractures in children as compared to cross pinning.

Materials & Methods: This study was conducted in orthopedic and trauma department of Fauji Foundation Hospital Peshawar w.e.f June 2015 to December 2016. Children with garland type II and III closed injuries without neurovascular compromise were included in the study. Outcome was measured in terms of ulnar nerve symptoms, non-union and varus mal-alignment.

RESULT: A total of 39 patients were included in the study, 22(56%) were type II and 17(44%) were type III fractures. Out of total type II fractures 17(77%) were managed with lateral only pinning and 5(23%) needed a medial pin as well. Of the type III fractures 10(59%) were managed by lateral pinning and 7(41%) by cross pin pattern. On final follow up no non-union, versus misalignment or ulnar nerve deficit was observed.

Conclusion: Lateral pin fixation has eliminated the risk of iatrogenic ulnar nerve injury with comparable clinical outcome to cross K-wire fixation.

Keywords: Supracondylar Humerus Fracture, Pin Fixation, Ulnar Nerve Injury.

INTRODUCTION:

In children supracondylar humerus fracture is the most common fracture around elbow. It accounts for 50-70% of all elbow fractures. Both conservative and operative methods are used for its management. Non operative treatment of supracondylar humerus fracture depends on fracture stability and the degree of displacement. Displaced supracondylar fractures of humerus in children are usually treated with closed reduction and percutaneous pinning. Cross pinning has been established as stable construction in literature. In medial-lateral cross K-wire technique two wires are placed in ascending manner, one through the lateral and another through the medial condyle. The ulnar nerve is at risk of injury by the medial wire passed through the medial condyle. Ulnar nerve injury rates of up to 6-8% have been documented in literature. Two parallel K-wires through lateral condyle can be placed to avoid ulnar nerve injury. This configuration of k wires is considered to be less stable than cross K-wire construction, which can increase the probability of ulnar nerve injury by 5.04 times the lateral ones.

In order to avoid instability lateral parallel wires can only be used in stable fractures to minimize the use of medial wires and ulnar nerve injury. The aim of this study was to study the results of lateral parallel pinning technique in garland type II and III supracondylar humeral fractures in children.

MATERIALS AND METHODS:

This study was performed in orthopedic and trauma unit of Fauji Foundation Hospital Peshawar. Children with closed garland type II and III distal humeral fractures in the absence of neurovascular compromise were included in the study. According to the protocol after closed reduction two lateral pins were passed. Stability of the fracture was then analyzed radio-graphically. In case of instability a medial pin was placed. The operating surgeon was responsible for his decision.

Minimum follow up of three months was required. Post-operative complications of non-union, varus misalignment assessed by Bauman’s angle >80° and ulnar nerve deficit were evaluated on follow ups.

Statistical Methods: All data was entered in to Statistical Package for Social Senices (SPSS) version 20 and percentages and proportions were reported.

Lateral pin fixation has eliminated the risk of iatrogenic ulnar nerve injury with comparable clinical outcome to cross K wire fixation. It is a safe alternative to cross pinning with excellent clinical outcome.

RESULTS:

A total of 39 patients were included in the study. 22(56%) were type II and 17(44%) were type III fractures. Out of total type II fractures 17(77%) were managed with lateral only pinning and 5(23%) needed a medial pin as well. Of the type III fractures 10(59%) were managed by lateral pinning and 7(41%) by cross pin pattern. On final follow up no non-union, varus misalignment or ulnar nerve deficit was observed.
Table No 1: Numbers and percentages of fractures managed with lateral pins only and lateral and median pin

<table>
<thead>
<tr>
<th></th>
<th>Type II Fractures</th>
<th>Type III Fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral Pinning Only</td>
<td>17 (77)</td>
<td>10 (59)</td>
</tr>
<tr>
<td>Lateral and Median Pinning</td>
<td>5 (23)</td>
<td>7 (41)</td>
</tr>
</tbody>
</table>

**DISCUSSION:**

This study presents clinical outcome of lateral only pinning in terms of non-union, vs mal-alignment and ulnar nerve injury, comparable to cross pin fixation for displaced type II and III fractures. Lateral only pinning has the primary advantage of decreased risk of ulnar nerve injury.

Iatrogenic ulnar nerve injury is possible even after a properly placed medial pin as described by Brown and Zinar. The risk of iatrogenic injury to ulnar nerve can be minimized by lateral only pinning the supracondylar humerus fracture in children. In the study of Browny et al. cross pinning resulted in iatrogenic ulnar nerve injury to every 28th patient as opposed to lateral only pinning. However there are certain disadvantages of lateral only pin fixation of supracondylar humerus fractures.

Even with the decreased risk for iatrogenic nerve injury, there are disadvantages to using only lateral pinning to correct supracondylar humeral fractures. Lateral only pin fixation is inferior to cross pinning biomechanically as concluded by Zionts et al. Zanzam and Bakarman described postoperative instability and the need for a medial pin in type III fractures. However Larsen et al detected no significant difference in torsional stability between lateral only and cross pin fixation. Though cross pin fixation is considered superior biomechanically, clinical outcomes in our study were the same. Our result may indicate that biomechanical superiority of cross pinning may not alter the clinical outcome to be statistically significant. As discussed in material and methods stress testing was done in all cases. Medial pin was placed only when it was felt unstable after lateral pin placement. In 77% of type II and 59% of type III gardland fractures there was no need of medial pin.

Cutting-edge contrast to the study of Brauer et al our results showed no loss of reduction and need for reoperation. Lee et al and Dezfuli et al showed excellent results with lateral only pinning which corresponds to our results. Limitations of this study include small sample size and lack of long term clinical follow up.

**CONCLUSION:**

We conclude that lateral only pin fixation in pediatric supracondylar fractures is safe alternative to cross pinning with excellent clinical outcome.

**REFERENCES.**

INTRODUCTION

Clubfoot or congenital talipes equino varus (CTEV) deformity of the foot is one of the ancient and is among the most common congenital abnormalities with unknown etiology. It is a major issue of today’s modern orthopedics with an incidence of 1.2 per 1000 live births in Caucasian population, with a male to female ratio of 2.25:1 affecting both feet equally. Many treatments modalities prevail to treat CTEV. Very conservative methods such as just stretching and physiotherapy in early neonates, orthosis and braces are used to address minor deformities i.e. minor forefoot adduction, varus and equinus can be corrected to variable extent and success. These can be used alone or adjunction to other methods. Splints, corrected to variable extent and success. These can be used alone or adjunction to other methods. Splints, braces and orthosis in a diverse forms are used to cope with CTEV individual components like equinus or more components simultaneously. Casting technique in CTEV management has well evolved over time from traditional casting towards organized Ponseti technique yielding better results than splints, braces and orthosis. Surgical intervention is done as a primary treatment modality or an adjunct to conservative measures for residual and resistant deformity or following failure of conservative techniques.

Ponseti technique for treating clubfoot or CTEV is simple, cost effective with durable results than all other modalities of treatments. In case of recurrence, relapse, resistant deformity and consequent disability in CTEV, Ponseti technique is the procedure of choice.

The diverse array of surgical interventions include posterior release, medial release, posterio-medial release, posterio-medial lateral release (Cincinnati) for heel varus and equinus correction and muscle balancing procedures in a younger child. Older children need combination of the soft tissue procedures and sometime corrective osteotomies. Children after puberty often need salvage procedure like triple arthrodesis alone or in combination with soft tissue releases and osteotomies.

Ponseti technique is a novel technique for correction of CTEV. It is an organized and principled...
modality of treatment with promising results\textsuperscript{17,18,19}. It is simple, demanding no technicality with cost effectiveness\textsuperscript{20,21}. Ponseti technique is simple, reproducible, less invasive and showing promising results if done properly, early initiated, good parent education and full attention to details. It is worldwide spread modality of treatment well complied way of intervention in clubfoot \textsuperscript{22,23}.

Our study is aimed to find out clinical outcome of Ponseti technique for the treatment of clubfoot in our experience at Khyber Teaching Hospital Peshawar, and to extrapolate our results to the public and private sector.

**MATERIAL AND METHODS**

This descriptive study was conducted at B unit department of orthopedics and traumatology Khyber teaching hospital Peshawar from June 2014 to June 2016. Patient inclusion criteria was:

1. Patients of idiopathic origin having forefoot adduction, midfoot cavus, hind foot varus and equinus were included.
2. Fresh patients as well as patients with previously failed or improper conservative treatment in the form of casts or braces or splints.
3. Age limit was from birth to 6 years.

Patients exclusion criteria was:

1. Patients with syndromic clubfoot i.e. arthrogryphosis multiplex congenita or other congenital limbs anomalies were excluded from our study.
2. Patients with previous surgical treatments i.e. posteromedial release or any other soft tissue or bony procedures were excluded.
3. Patients with neuromuscular disorders were excluded.
4. Patients with systemic illnesses were also excluded from our study.

All patients were recruited via outpatient department (OPD) directly and through referral from lower orthopedic center and clinics across Khyber Pukhtoonkhwa mostly and also from adjacent districts of Punjab province and Afghanistan as well. Patient were dealt in Ponseti clinic in our department on all week days. Data including age, sex, photograph of the patient foot, no visit and cast, Pirani scoring, clinical assessment, and any complication during treatment were documented on a preformed proforma and the data was uploaded on international Ponseti web. On each weekly visit after taking data and scoring all patients undergone manipulation and passive stretching for 2 to 3 minutes then cast was applied first to the foot, then below knee and finally above knee. The order of correction of deformities was “CAVE” according to Ponseti principle that is first correcting Table 1: Pirani scoring system

<table>
<thead>
<tr>
<th>Physical examination</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curvature of lateral border</td>
<td>0, 0.5, 1</td>
</tr>
<tr>
<td>Medial crease</td>
<td>0, 0.5, 1</td>
</tr>
<tr>
<td>Posterior crease</td>
<td>0, 0.5, 1</td>
</tr>
<tr>
<td>Palpation of head of talus</td>
<td>0, 0.5, 1</td>
</tr>
<tr>
<td>Emptiness of heel</td>
<td>0, 0.5, 1</td>
</tr>
<tr>
<td>Rigidity of equinus</td>
<td>0, 0.5, 1</td>
</tr>
</tbody>
</table>

Table 2: Relapse grading

<table>
<thead>
<tr>
<th>Physical examination</th>
<th>Decrease in ankle dorsiflexion from 15 degrees to neutral</th>
<th>Dynamic forefoot adduction or supination</th>
<th>Regid equinus</th>
<th>Regid forefoot adduction</th>
<th>Combination of two or more deformities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>IA</td>
<td>IB</td>
<td>IIA</td>
<td>IIB</td>
<td>III</td>
</tr>
</tbody>
</table>

Table 3 showing no of patients, Pirani score and outcome

<table>
<thead>
<tr>
<th>No of patients (n=98)</th>
<th>Pirani score at last follow up</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=70 (71.4%)</td>
<td>0</td>
<td>Excellent</td>
</tr>
<tr>
<td>n=12 (12.25%)</td>
<td>0.5</td>
<td>Good</td>
</tr>
<tr>
<td>n=10 (10.20%)</td>
<td>1.0</td>
<td>Fair</td>
</tr>
<tr>
<td>n=6 (6.12%)</td>
<td>1.5</td>
<td>Poor</td>
</tr>
</tbody>
</table>
midfoot cavus by simply supinating the foot in a manner that the deformity seems to be exaggerated by external look. After cavus forefoot adduction was corrected and finally equinus was addressed. When Pirani score was brought to 1.5 (posterior crease, emptiness of heel, rigid equinus) and not improving further percutaneous tendo-achillitenotomy under local anaesthesia in minor operation theater was performed and final cast was given in hypercorrected (15 to 20 degree dorsiflexion and 60 to 70 degree abduction). At removal of final cast Dennis brown splint was given for maintenance of correction 23 hour for first 3 months then 12 hours for 2 to 3 years. All patients were clinically assessed via Pirani scoring (table 1) and relapse grading (table 2) and outcome via Pirani score (table 3).

RESULTS

Our study enrolled a total no 98 patients (130 clubfeet) out of which 71.40 % (n=70) were male and 28.6 % (n=28) were female. Mean age was 15.46±15.3 months (2SD) with a range of 0.23 months to 60 months. Average follow up was 21.38±2.24 moths (2SD) with a range of 17 to 24 months. Mean number of casts was 9.57 with a range of 5 to 20 casts. 38.8 % (n=38) patients underwent percutaneous tendo-achillitenotomy. 71.42 % (n=70) patients showed excellent results, 12.25 % (n=12) patients had good results, 10.2 % (n=10) patients had fair outcome and 6.12 % (n=6) showed poor results with recurrence of deformity. Fair category were considered for re-Ponseti and among poor category patients (n=6) 4 patients underwent PMR being followed and 2 patients were offered PMR plus tibialis anterior transfer for correction of adduction deformity. Five patients showed minor complications i.e 3 showed skin excoriation and two patients showed skin breakage which were addressed via symptomatic treatment (skin ointments, analgesics and oral antibiotics for three days). No issue of femur fracture, knee stiffness or ischemic event happened during the study.

We encountered few problems during the study. Due to poverty, lack of education and awareness some of the children were paying infrequent visits i.e presenting on second or third week rather than on weekly basis. Some of the patients have lost cast integrity due to soakage or breakage during follow up. During maintenance phase some of the patients had their own way of putting Dennis brown splint i.e not for 23/24 hour schedule but for a less time and inconsistently. All these confounding factors may have biasing effects on our outcome and results. Pictures showing clinical assessment and ponseti scoring (a) and (b), final cast (c) and Dennis brown splint (d).

Vo NQ and huynh a prospective study in Vietnam enrolling 101 patients (142 clubfeet) over a mean follow up of 2 years, 95.8 % patients showing excellent and good results, 91.8 % showing fair and 6.6 % poor outcome. These results are comparable to our results with almost the same follow up but different scoring system.

Porecha MM, Pamar DS, Chavda SR one of an Asian prospective study encompassing 49 patients (67 clubfeet). They achieved excellent and good results in 89.79 % (44 patients) and 20.1 % (5 patients) were among fair and poor category at initial assessment. These results are almost equal to our results but their follow up (minimum 5 years) is quiet long and more reliable than us.

Although our study is yielding good results comparable to most of the studies in the literature our sample may not be a representative one and our follow was short as compared to other studies. Our patients/parents are from low socioeconomic stratum and low IQ, not strictly following treatments guidelines. Poverty and money is another issue which may have confounding and biasing effects on our outcome. Another fact regarding our study is that our study population was included elder children (up to 5 years) with their deformity quite difficult to treat and to have good results, this may have abberative effect on outcome. Large scale multicenter randomized control trials can have proper answer for minute details of clubfoot.
CONCLUSION

5. Ponseti technique for treating clubfoot or CTEV is simple, demanding no expertise and technicality, cost effective and giving superior and durable results than all other modalities of treatments. In the perspective of recurrence, relapse, resistant deformity and consequent disability in CTEV, Ponseti technique should be the first and index procedure for its treatment.

6. REFERENCES

Accuracy of Siriraj Scoring System in Detection of Ischemic Stroke Confirmed by Computed Tomography

M. Sajjad Ali Khan FCPS, Umar Hayat FCPS, Rabia Basri DPT

ABSTRACT

Background: Stroke is the leading cause of death and long-term disability for middle to old age patients. The clinical and radiological distinction of ischemic from hemorrhagic stroke is important from management and prognosis perspective. The Siriraj score is an important development for effective differentiation between the two entities of stroke.

Objective: The aim of this study was to determine the accuracy of Siriraj scoring system in the detection of ischemic stroke as confirmed by computed tomography.

Methods: A prospective observational study conducted at the department of General Medicine, between December 2012 and June 2013 (6 months). Patients suspected of suffering from acute ischemic stroke were evaluated using the Siriraj scoring system followed by CT scan of the brain. Both of the findings were compared and accuracy of the Siriraj scoring as compared to findings of CT scan was evaluated.

Results: Mean patient age was 63.65 ± 10.2 years with 61.6% males and 38.4% females. Majority were older patients of which 82% were above the age of 55 years. 80.5% (132) patients of ischemic stroke were correctly diagnosed using the Siriraj scoring system.

Conclusion: Siriraj scoring system is a simple and useful tool in identifying acute ischemic stroke.

Keywords: Stroke, Siriraj Scoring System, acute ischemic stroke.

INTRODUCTION

Stroke is a major public health problem is a major cause of death and long-term disability worldwide. The overall mortality due to cerebro-vascular (CVD) disease is 251.2 per 100,000. Hypertension is a major modifiable risk, followed by smoking, diabetes, dyslipidemia, obesity, heart disease and alcoholism. Mortality from stroke is reported to be 20% and majority of patients are dependent in their daily activities. The differentiation between ischemic and hemorrhagic stroke is essential for medical intervention in the form of thrombolytic therapy. Clinical features of ischemic and hemorrhagic stroke are varied and it is challenging to differentiate on clinical grounds. CT scan of brain has now become the main diagnostic utility. Patients from countries with limited health care facilities will not have access to brain imaging procedures.

Various scoring systems were introduced during the past few years to differentiate ischemic from hemorrhagic stroke on clinical grounds. Literature review suggests mixed results with respect to accuracy of a single clinical score as compared to the efficacy of CT scan. We therefore, undertook to evaluate the diagnostic accuracy of Siriraj score. As a result, it will lead to correct diagnosis and better patient management.

Stroke is the leading cause of death and long-term disability for middle to old age patients. Siriraj stroke score is a simple tool with high accuracy in detecting acute ischemic stroke. The clinical and radiological distinction of ischemic from hemorrhagic stroke is important from management and prognosis perspective. The Siriraj score is an important development for effective differentiation between the two entities of stroke. It is a preferred Siriraj scoring system in accuracy to detect ischemic stroke as confirmed by computed tomography.

METHODS

This is a prospective observational study of 6-month duration between December 2015 and June 2016 conducted at the department of General Medicine after obtaining permission of the institutes’ ethical committee. Informed consent was obtained from the patients or their relatives regarding inclusion into the study. All investigations were performed within the hospital. Patients between the ages of 35 and 100 years of age were included. Suspected cases of stroke, defined as those having inability to move one or more limbs, with difficulty in speech or with loss of consciousness. Confirmation of the nature of stroke was done using a
Accuracy of Siriraj Scoring System in Detection of Ischemic Stroke Confirmed by Computed Tomography

non-enhanced CT scan of the brain, after complete stabilization of the patient in the emergency and resuscitation room of our unit. Patients with final diagnosis other than an ischemic or hemorrhagic stroke (tumor, multiple sclerosis etc.), patients with transient ischemic attack (TIA), those with acute delirium, dementia and subarachnoid or subdural hemorrhage were excluded.

A diagnosis was established after obtaining detailed history and examination. The Siriraj scoring was done according to the criteria listed below. Patients included in the study were investigated with a non-enhanced CT scan of the brain on emergency basis. Findings were recorded on a digital chart and the scores were compared to the diagnosis based on CT scan of the brain. A single consultant radiologist assessed the CT scans while a single consultant internist did the Siriraj scoring. The data was entered and analyzed using SPSS version 22.0. Continuous variables are presented in mean ± standard deviations while the categorical data is presented in frequency tables and graphs.

RESULTS
The study was conducted on 164 patients presenting with clinical suspicion of ischemic stroke. The mean age of the sample of 164 patients was 63.65 ± 10.2 years. The patients were distributed in 4 age groups. In the age group 35-45 years we had 10 (6%) of patients, in the age group of 46-55 years we had 19 (11.6%) patients, in the age group of 56-65 years we had 59 (36%) of patients and in the age group of more than 65 years we had 76 (46.4%) of patients.

A total number of 164 patients who presented with clinical suspicion of acute ischemic stroke having SSS of ≤ -1. There were 101 (61.6%) males and 63 (38.4%) females.

All the included patients having clinical suspicion of acute ischemic stroke and having SSS of ≤ -1 were subjected to CT brain in the radiology department of the hospital. On CT brain acute ischemic stroke was found in 132 (80.5%) of patients (on the basis of focal hypodense lesion). (Table 1)

On following the operational definition of accuracy of SSS on the basis of finding on CT brain, the accuracy of SSS was found in 132 (80.5%) of patients. (Table 2) While distributing the accuracy about gender, we found that a small difference surely existed. Out of total 101 males in our study, the accuracy of SSS was found in 87 (86%) while in the female gender out of total 63 included patients having SSS of ≤ -1, accuracy was observed in 45 (71.4%) of patients.

While distributing the accuracy with regards to age groups, we found that other than younger age, older age group didn’t show much difference. In the age group of 35-45 years the accuracy was observed to be 60%. In the age group of 46-55 years, the accuracy of SSS was observed to be 68.4%, in the age group of 56-65 years the accuracy of SSS was found to be 86.4% and in the age group of more than 65 years, the accuracy of SSS in detecting acute ischemic stroke was found to be 81.6%.

<table>
<thead>
<tr>
<th>TABLE NO: 1. Frequency stroke on CT brain (n=164)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STROKE</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE NO: 2. Accuracy of Siriraj scoring system (n=164)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCURACY</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

DISCUSSION
According to multiple systematic reviews, the availability and use of brain imaging varies considerably in developing countries between centers. However, it was reported that the availability of CT scanners is scant in developing countries. For instance, 18 tertiary centers in African countries have no CT scanners and 13 centers have only had one. Consequently, stroke scoring systems which may help in clinically distinguishing hemorrhagic from ischemic could be definitely useful for appropriate decision making in acute circumstances, such as initiating thrombolytic therapy.

The advent of Allen stroke and Siriraj Stroke Score have led to the bedside diagnosis of ischemic and hemorrhagic stroke, helping in its management. The utility of these diagnostic scoring systems would be to exclude hemorrhagic stroke so that to offer thrombolytic or antithrombotic therapy. The benefit of these scoring systems increase in areas where CT scanners are not readily available in our country, for instance the peripheral districts of our province.

Although CT scan is the gold standard investigation for confirmation of the diagnosis of stroke as well as distinguishing ischemia from hemorrhage, the readily availability CT scan is not always feasible. Three stroke scores are available, namely, The Guys Hospital Score (GHS), the Siriraj stroke scale (SSS) and the Allen’s score. Of these the SSS is practically easier to be applied at bed-side and doesn’t require longer questionnaires.

The present study was performed on a sample of 164 cases presenting with clinical suspicion of acute ischemic stroke. All the participants of the study had a SSS of ≤-1. Patients were subjected to CT brain to confirm the findings of the SSS and accuracy of SSS was observed in 80.5% of cases. A study by Nyanditi...
et al\textsuperscript{15} have similar results to our series, who reported accuracy of SSS in 76.2\% cases\textsuperscript{19}, as opposed to some of the Nigerian and Ethiopian studies who reported lower accuracy.\textsuperscript{16, 17, 18, 19}

Some external validation studies have reported conflicting results regarding the accuracy of SSS, however, majority of these studies are performed on smaller samples and are retrospective in design. A recent study from South Africa\textsuperscript{20}, which was conducted on 222 cases, showed that the SSS failed to diagnose more than 80\% of stroke. Two other retrospective studies from Africa, have reported a low yield for the SSS. In another retrospective study from the United Kingdom\textsuperscript{9}, suggests poor accuracy of SSS for differential diagnosis of stroke subtype, however, a very little proportion of patients included in this study had complete data. The results of the present study are consistent with some studies conducted in other developing countries.\textsuperscript{21, 22}

Since thrombolytic therapy is not a readily available option for our patients due to none or limited availability of alteplase or other tissue plasminogen activators, the use of this score for excluding hemorrhagic stroke will enable a physician in periphery to at least initiate anticoagulation or antiplatelet agents.

In a study by Dennis and co-workers\textsuperscript{2} from Brazil, it was shown that SSS could not confidently differentiate between hemorrhagic and ischemic stroke.\textsuperscript{23} However, this is a general problem with clinical scoring systems. In a study by Celani and associates\textsuperscript{24}, it was shown that clinical scoring systems exhibit poor overall accuracy for the use of antithrombotic treatment, and their use should only be advised to classify strokes for academic purposes or in places where CT is not readily available. Ozeren et al\textsuperscript{25}, however, have advocated their use in epidemiological research as well as a diagnostic tools in clinics.

CT is a very practical tool for assessment of acute stroke, it is quick and can be safely done in critically ill patients. Though it can accurately identify cerebral hemorrhage in acute and sub-acute stages, this technique also has some limitations. Intra-cerebral hemorrhage is frequently mistaken for ischemic stroke if CT is not done within 10 to 14 days after stroke.\textsuperscript{23} A study, which compared the SSS on a group of 1059 patients with CT, proven stroke. The sensitivity of SSS was 68\% and specificity was 64\% specificity. The above mentioned study concluded that SSS is not useful for the exclusion of hemorrhage before anticoagulant treatment is initiated or as a diagnostic screening procedure for trials of low-risk treatments such as aspirin.\textsuperscript{9}

Hawkins et al reported similar findings in a study conducted in New Zealand.\textsuperscript{26, 27} However, in another recent study by Sherin and colleagues reported the accuracy of SSS to be 75\%.\textsuperscript{28} The mean age of the patients who presented with stroke in our study was 63.65 ±10.2 years. Similar observations were noted by Raghuram PM\textsuperscript{28} and in another study by Whadhwani et al\textsuperscript{29} in a study which was done in Indore in India.\textsuperscript{28} Another study by Salawu F et al\textsuperscript{30}, reported a mean age of 58.75 ± 14.24 for males and 52.1 ± 9.97 for females.\textsuperscript{30} Stroke has been shown with increasing incidence in increasing ages.

The variability of results for SSS can be explained by difference in settings, ethnicity, local prevalence rates of hemorrhage and cerebral infraction in different countries and also the difference in methods of data collection (e.g. prospective and retrospective data).\textsuperscript{27} The SSS cannot be out rightly rejected for its clinical utility, due to a plethora of clinical studies favoring the use of SSS for diagnosis of acute ischemic stroke.\textsuperscript{31} The weakness of our study is lower number of risk factors inclusion in the data analysis, shorter duration and relatively smaller sample size and single center experience. A randomized study may ameliorate these weaknesses, involving multiple stroke referral centers.

**CONCLUSION**

Siriraj stroke score is a simple tool with high accuracy in detecting acute ischemic stroke however, since this study did not took into account the presence of hemorrhagic stroke so we will recommend further studies on larger basis for epidemiological utilization of this score or for case selection during randomized trials before the availability of CT scan.

**REFERENCES**


Accuracy of Siriraj Scoring System in Detection of Ischemic Stroke Confirmed by Computed Tomography


INTRODUCTION:

Prevalence of work related musculoskeletal disorders like neck and back pain which has increased considerably in the recent past throughout the world which not only effects health of the individual but also leading to disabilities and significant economical consequences in the form of sick leaves and medical expenses. Health professional experience more work related health problems than other professional groups. The working environment and the physiological state during work in hospitals greatly affects musculoskeletal systems resulting in low productivity and job satisfaction.

Low back pain (LBP) is a common musculoskeletal disorder which implies pain to the region from lower ribs till the gluteus fold. Mechanical LBP arises from the combination of many factors resulting from trauma to muscles, tendons, ligaments, inter-vertebral discs and nerves or vertebra of spine, but the commonly arises with no structural abnormality. Fortunately, most of these episodes are self-limiting and approximately 90% of patients improve completely within 6 weeks, regardless of the intervention received. The chronic back pain is the result, when it exists more than 2 months. However, appropriate and timely effective treatment can prevent backache to develop into chronic phase. LBP. About 60-80% of general population suffers from LBP at least once in a life with recurrence of 30%-40% every year.

There is a high prevalence of back pain (53%) amongst the general surgeons due to long standing and long hours of surgical processes, which implicate their work and daily life activities. It is an important clinical feature which need thorough investigation for prevention and early management of back pain among surgeons.

The recent global review of the prevalence of LBP in general adult population is reported to be 12-33% and 22-65% with prevalence one year. The disability related to LBP has major economical impact on any society. The estimated cost on LBP in UK (1998) is 11 billion US Dollar whereas in USA it was about 50 billion US Dollars.

Most of the back pain studies are based on high-income and industrialized countries, and there is little information on specific and general population of middle and low-income countries. Pakistan being the cyber country in the world, it needed to evaluate the prevalence and dynamics of these problems and its associated financial burden.

Technological advances in surgical procedures have revolutionized the quality of life people, with dynamic staff to be involved in, some time standing for long hours of time depending upon the type of surgery. Intensive surgical work without break puts biomechanical stresses on muscles and joints of spine because of continuous nature of work. As a number of studies on neck pain were carried out in Pakistani population, only a limited literature is on back pain is available particularly in general surgeons of...
Peshawar KPK.

MATERIAL AND METHODS:

A cross sectional study was conducted and data was collected from the sample population. The sample was taken from five tertiary care hospitals (Lady Reading Hospital, Khyber Teaching Hospital, Hayatabad Medical Complex, North West General Hospital and Rahman Medical Institute) of Peshawar among the surgeons who fulfilled the inclusion/exclusion criteria.

Inclusion criteria & exclusion criteria: 1) Female and male general surgeons 2) Age between 30-45 years 3) Surgeons in current practice since 6 months 4) Doctors performing ≤ 5 surgeries per week, Exclusion criteria: 1) Doctors with systematic diseases 2) History of non-occupational injuries 3) Significant back pain prior joining surgical field.

Questionnaire and study sampling: The modified Oswesty Low Back Pain Disability Questionnaire (OLBPQ) was used which is a valid and reliable[14] and includes work related different parameters. Modification in this questionnaire was done specifically for this study which includes demographic characteristics of study participants, some basic perception of their back pain and it included the treatment option for their pain cure. A total of 300 participants were included on the basis of inclusion criteria, furthermore 10 questionnaires were rejected due in incomplete questionnaires. The questionnaire consisted 2 parts one related to demographic characteristics and another section was concerned with low back disability. Data was analyzed using SPSS version 21. The demographic characteristics included participant’s age, gender and months/years since surgical career started, while the responses from questionnaire were calculated as percentages and frequencies. The collected data from both the demographic characteristics and from questionnaire was presented in tables and graphs.

RESULTS:

Data analysis showed that n= 140 (53%) subjects out of 240 subjects reported for back pain. Among 53% the 47% were females and 53% were male with mean age of 38 years ± 3.12(table 1). The mean duration of their surgical career in years was 2 years ± 2.2 while the mean of 3 surgeries were performing by them with standard deviation± 2.1 per week. On the disability index 35% subjects reported to have minor disability while 55% reported to have to moderate disability and only 15% very having severe disability. 65% subjects reported for no pain at the time of responding to questionnaire while 20% to 15% reported for mild to moderate pain respectively at time of filling questionnaire.

On the section of weight lifting, 10% responded that they can lift heavy weight without causing extra pain, 40% reported that they can lift weight with extra pain, while 50% reported that they can lift only light weight. On the section of walking, the 35% participants reported that they do not prevent by walking long distances due to their back pain while 35% - 30% reported that pain prevents from walking a long distances and short distances respectively.

On the section of sitting, 60% reported that they can sit as long they want without pain onset while 40% reported that they can sit in their favorite chairs for long period of time.

On the section of standing, only 30% reported that they stand for long period of time but it causes pain for them while 60% and 10% reported that they cannot stand more than 1 hour. On the other sections including personal care, sex life, social life, sleeping and travelling, the participants did not responded significantly on these sections.

About 75% subjects thinks that they overload themselves some times, the same proportion reported their surgery performing posture as continuous standing. 65% thinks that their pain is related to their work and 80% of proportion do not use any pain remedies for alleviating their back pain. Among them 26% relies on home remedies like heat packs, massage etc, 20% consulted orthopedic specialist and 14% consulted physiotherapist as for their back pain is concerned.

Table 1: Disability of participants on Index

DISCUSSION:

The results shows 53% of medical surgeon have back pain specifically during walking, standing and prolonged sitting and the pain they reported was mild to moderate in nature. The findings of our study are comparable to the results of a cross sectional survey[15] conducted in India which showed 37% prevalence of back pain among surgeons, they identified the common surgical position as long standing. Loading the spine with continuous standing along with repetitive tasking and awkward bending put biomechanical stresses over spine and justifies the reason of high back pain.
prevalence in this study. Another cross sectional study in Iran reported for back pain among 95% of general surgeon but however they had a very small size of only 45 participants. It was previously reported by T Rambabuand K Suneetha that the back is the most commonly affected area among surgeons. The previous studies found significant relation of back pain with gender and body mass index (BMI) of individuals reporting that female are more likely to have back pain and are more common among underweights. This study reported that 47% female and 53% males had back pain showing almost a same proportion in contrast to above studies. Babatunde et al., showed in his study that risk factors that commonly cause back pain are excessive work, working in the same positions, not enough rest breaks and bending and twisting in the awkward positions makes small injuries inside the structure which finally dispose off as a pain. These are the same risk factors as surgeons were reported to be facing in this study. Other than back pain, the shoulder pain also reported to be frequently occurring among surgeons as reported by Grace PY Szeto et al., of 53% shoulder pain prevalence among general surgeons. The reason is again holding the arm in flexion and abduction for a long period of time. Therefore it is necessary to adopt the posture recommended by health professional specifically for those positions that have to be maintained for longer time period.

CONCLUSION:

There is 53% prevalence of back pain among general surgeons of five tertiary care hospital of Peshawar KPK. The risk factors indentified among them for their back pain are long standing and long hours of surgical processes. The findings of this study have important clinical implications for prevention and early management of back pain to prevent the associated pathologies. It is suggested that further research should be done to evaluate more precisely the risk factors associated with back pain amongst the surgeons.

REFERENCES.

Study of Relation Between Ventricular Septal Defect (VSD) in Cousin Marriages in Mardan

Dr. Shaukat Ali DCH, FCPS., (Paed)1. Khlail MBBS2

ABSTRACT

Background: In Pakistan, the prevalence of Congenital Heart Diseases (CHD) in neonates was found to be 4 per 1000 live births. Prevention of congenital cardiovascular defects has been hampered by a lack of information about modifiable risk factors for abnormalities in cardiac development. Over the past decade, there have been major breakthroughs in the understanding of inherited causes of CHD, including the identification of specific genetic abnormalities for some types of malformations. Cousin marriages is widespread in Pakistan. The majority of studies on cousin marriages in Pakistan have been carried out in urban metropolitan areas, and data on rural populations are scarce.

Objective: To determine the relation between ventricular septal defect and cousin marriages in children presenting in a D.H.Q Hospital Mardan.

Setting: Pediatric Unit (indoor, outdoor nursery unit, emergency room), Department of Pediatric Medicine, in D.H.Q hospital Mardan.

Study Design: Case control study.

Duration of Study: Six months (1/2/2015 to 2/8/2015).

Material and methods: In this study sample size of 84 patients: 42 cases and 42 controls was calculated. Taking expected percentage of cousin marriages i.e. 49% in cases with VSD and 29% in controls (without VSD); presenting to our hospital. Non probability, consecutive sampling technique was used for sample collection.

Results: Our study shows that in case group, mean age was 1 years, where as in control group, mean age was also 1 year. In case group, (62%) patients were male while (38%) patients were female. Where as in control group, (58%) patients were male and (42%) patients were female. In case group, (51%) patients had cousin marriages while (49%) patients didn’t had cousin marriages. Where as in control group, (28%) patients had cousin marriages and (72%) patients didn’t had cousin marriages.

Conclusion: Our study concludes that there is an association between parental consanguinity and congenital heart disease in children presenting to children unit of D.H.Q Hospital Mardan.

Key words: Ventricular septal defect, cousin marriages.

INTRODUCTION

Ventricular septal defect (VSD) is the most common congenital disorder in newborns. Advances in cardiovascular medicine and surgery have enabled most patients to reach adulthood.(1) Consequently, the prevalence of VSD is unclear, with estimates exceeding the number of patients currently seen in cardiology clinics.(2) In Pakistan, the prevalence of CHD in neonates was found to be 4 per 1000 live births.(2)

Prevention of congenital cardiovascular defects has been hampered by a lack of information about modifiable risk factors for abnormalities in cardiac development. Over the past decade, there have been major breakthroughs in the understanding of inherited causes of VSD, including the identification of specific genetic abnormalities for some types of malformations.(3)

Cousin marriages are widespread in Pakistan.

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2. Medical Officer DHQ Hospital Mardan

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Cousin marriages are widespread in Pakistan.
more study has supported this evidence and showed that there was no association between VSD and cousin marriages i.e. 3.9% among cases and 4.1% among control.[10] MATERIAL AND METHODS:

In this study sample size of 84 patients; 42 cases and 42 controls was calculated with expected percentage of cousin marriages i.e. 49% in cases with VSD and 29% in controls (without VSD), presenting to OPD and children ward of DHQ Hospital Mardan. Non probability, consecutive sampling technique was used for the study. The rationale of this study is to measure the association between parental cousin marriages and VSD in children presenting to children unit of D.H.Q Hospital Mardan. Literature has reported that VSD is significantly associated with cousin marriages but controversy also exists as the cousin marriages is a modifiable risk factor. Cousin marriages can be avoided by social education of community to prevent VSD. We desire to conduct this study to confirm the relation between VSD and cousin marriages

Literature Review: congenital heart disease (CHD) and VSD. Congenital heart defect may be defined as an anatomic malformation of the heart or great vessels which occurs during intrauterine development, irrespective of the age at presentation. Ventricular septal defect is a typical example of CHD.

Often viewed as a problem of adults, cardiovascular disease also take a terrible toll of the youngsters. Congenital cardiovascular defects, are the most common birth defect in the U.S.[2] and the leading killer of infants. [3] The incidence of CHD ranges between 4 and 10 per 1,000 live births.[4,2] beyond the terrible death toll, physical and mental suffering. In 2004, hospital costs for all individuals with CHD totaled $2.6 billion.[5] Due to modern treatment most survive to adulthood, including many who formerly would have died.[4] However, the survivors are more likely to develop complicated heart problems later in life.[6]

Ventricular septal defect (VSD) is one of the commonest congenital heart diseases, left to right shunt across the ventricular level. This shunting occurs during systole and blood from LV is ejected in systole to the pulmonary circulation and causes a volume overload to the left atrium and the LV. There is an increased pulmonary flow but there is no volume overload to the RV as blood physiologically during systole makes it directly into the pulmonary circulation. Since in a VSD, the shunting occurs during systole (high pressure), the left to right shunt is haemo-dynamically more significant and the progression towards pulmonary vascular disease can occur as a result.[11]

RESULTS

The study was conducted in Department of Pediatrics at D.H.Q Hospital Mardan in which a total of 168 patients (84 cases and 84 controls) were observed to determine the association between cousin marriages and VSD in children presenting to our hospital and the results were analyzed.

Age distribution was analyzed as in case group, 28(33.5%) patients were in age < 1 year, 10(12%) patients were in age range 1-5 years, 4(4.5%) patients were in age range 6-10 years. Mean age was 1 years . Where as in control group, 27(32%) patients were in age < 1 year, 10(23.8%) patients were in age range 1-5 years, 5(11.9%) patients were in age range 6-10 years. Mean age was 1 years (as shown in table no 1)

Gender distribution was analyzed as in case group, 26(31%) patients were male while 16(19%) patients were female. Where as in control group, 25(59.5%) patients were male and 17(40.4%) patients were female (as shown in table no 2).

Status of cousin marriages was analyzed as in case group, 22(52.3%) patients had cousin marriages while 20(47.7%) patients didn’t had cousin marriages. Where as in control group, 11(13%) patients had cousin marriages and 31(37%) patients didn’t had cousin marriages. (as shown in table no 3)

<table>
<thead>
<tr>
<th>AGE</th>
<th>CASES n=42</th>
<th>CONTROL n=42</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>28(33.5%)</td>
<td>27(32%)</td>
</tr>
<tr>
<td>1-5 years</td>
<td>10(12%)</td>
<td>20(23.8%)</td>
</tr>
<tr>
<td>6-10 years</td>
<td>4(4.5%)</td>
<td>10(11.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>42(100%)</td>
<td>42(100%)</td>
</tr>
</tbody>
</table>

Mean and SD 1 years ± 1.07 1 years ± 1.13

TABLE NO 2. Gender Distribution (n=84)

<table>
<thead>
<tr>
<th>GENDER</th>
<th>CASES n=42</th>
<th>CONTROL n=42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26(61.9%)</td>
<td>25(59.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>16(38.11%)</td>
<td>17(40.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>42(100%)</td>
<td>42(100%)</td>
</tr>
</tbody>
</table>

Cases: Patients with VSD Controls: patients without VSD
Study of Relation Between Ventricular Septal Defect (VSD) in Cousin Marriages in Mardan

TABLE NO 3: Cousin Marriages (n=84)

<table>
<thead>
<tr>
<th>Cousin marriages</th>
<th>CASES n=42</th>
<th>CONTROL n=42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22(52.3%)</td>
<td>11(26.1%)</td>
</tr>
<tr>
<td>No</td>
<td>20(47.7%)</td>
<td>31(73.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>42(100%)</td>
<td>42(100%)</td>
</tr>
</tbody>
</table>

Cases: patients with VSD Controls: patients without VSD

TABLE NO 4: Stratification of cousin marriages w.r.t. age (n=84)

<table>
<thead>
<tr>
<th>AGE</th>
<th>Cousin Marriages</th>
<th>CASES n=42</th>
<th>CONTROL n=42</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>Yes</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>1-5 years</td>
<td>Yes</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>6-10 years</td>
<td>Yes</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Cases: patients with VSD Controls: patients without VSD

TABLE NO 5: Stratification of cousin marriages w.r.t. gender (n=84)

<table>
<thead>
<tr>
<th>GENDER</th>
<th>Cousin marriages</th>
<th>CASES n=42</th>
<th>CONTROL n=42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Yes</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>Yes</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

Cases: patients with VSD Controls: patients without VSD

DISCUSSION

Congenital heart disease esp VSD is the most common congenital disorder in newborns. In Pakistan, the prevalence of CHD in neonates was found to be 4 per 1000 live births.[2] Cousin marriages are widespread, the majority of studies have been carried out in urban metropolitan areas while the data on rural populations are scarce. First cousin unions had the highest representation (49.11% of all marriages), and marriages up to distantly related/Biradari constituted 67.94% of all marriages.[4] Numerous articles have been published linking cousin marriages to an elevated prevalence of ventricular septal defects (VSD) as the most commonly cited disorder.[5]

Our study shows that in case group as well as control group, mean age was 1 year. In case group, (61.9%) patients were male while (38.1%) patients were female. Whereas in control group, (59.5%) patients were male and (40.4%) patients were female. In case group, (52.3%) patients had cousin marriages while (47.7%) patients didn’t had cousin marriages. Whereas in control group, (26.1%) patients had cousin marriages and (73.9%) patients didn’t had cousin marriages.

One study has reported that among cases of VSD, the cousin marriages was present in 77.9% parents while among controls, cousin marriages was present in 43.3% parents.[6] One more study has showed that among cases, cousin marriages was present in 49% and among controls, cousin marriages was present in 29%.[7]

But another study has reported that there was no association between VSD and cousin marriages i.e. 22% among cases and 19.1% among control.[8,9] One more study has supported this evidence and showed that there was no association between VSD and cousin marriages i.e. 3.9% among cases and 4.1% among control.[10]

In South India, Bennett RL12 aimed to maintain comparability in the ethnic and socio-economic backgrounds of the cases and controls groups in their study. They analyzed 144 cases of congenital heart disease ascertained from three major hospitals in Mysore in the state of Karnataka over two years versus 200 randomly-selected controls selected from the same region. To assess the potential risk of cousin marriages on VSD, they interviewed all families and obtained family histories, and representative pedigrees from families with cousin marriages were shown. As with many studies, the details of the interviews to assess either cousin marriages or VSD were not published, leading to an assumption that the ability to ascertain a family history of disease was similar in cases and controls. The authors also incorporated parental ages into a logistic regression analysis. The parents of 15.5% of the control group were cousin marriages versus 40.3% of the VSD families, and it was concluded that the study suggested an approach to the recessive contributions to sporadic VSD via cousin marriages. Although patient age was utilized as a covariate in the analyses, further information regarding the specific characteristics of the case and control groups would
have been even more helpful in interpretation of this study.

Yunis et al\textsuperscript{13} in a study based in Beirut, Lebanon studied 173 cases of VSD from a perinatal collaborative network, and their 865 controls were selected from the same hospitals’ neonatal intensive care units. Mothers were interviewed in their native language and cousin marriages was categorized by degrees of parental relationship. Data regarding neonatal variables and maternal factors were also assessed. At first-cousin level, after controlling for a number of factors an adjusted odds ratio (OR) for the effect of first cousin relationships ($F = 0.0625$) on VSD of 1.8 (95\% confidence interval (CI) 1.1–3.1) was reported. More distant consanguinity ($F <0.0625$) revealed an OR of 1.7 for VSD, although the 95\% CI was 0.8–3.5. The study included control for a number of potential confounders, and the authors concluded that the study confirmed an association between cousin marriages and VSD among newborns in Beirut.

In a larger study, Chehab et al\textsuperscript{14} studied 1585 cases of VSD from a national pediatric heart disease registry also in Lebanon and 1979 controls without VSD from the same registry. An additional control group from a UNICEF study also was utilized. Although the details of the collection of registry information were not described in the article, the authors comparatively analyzed the data from these reasonably large groups. Cousin marriages were present in a higher proportion of VSD cases versus controls when the analysis was performed on first-cousins (cousin marriages in 19.4\% of cases versus 14.4\% in controls) and when first and second-cousin parental relationships ($F \geq 0.0156$) were co-analyzed. On the latter basis it was concluded that all degrees of cousin marriages were greater in patients with VSD compared to controls.

There is a possibility of some overlap in subjects in the studies by Yunis et al\textsuperscript{13}, and Chehab et al\textsuperscript{14}, as both studies were conducted on individuals in Lebanon. In recognizing differences between cases and controls, the authors did address potential limitations of their study. They also acknowledged the importance of identifying the specific genetic risk factors in VSD and emphasized that the identification of genes involved in congenital malformations would improve counseling.

Some studies addressed the potential caveats in their data, e.g. Bassili et al\textsuperscript{15} performed a case-control study in Alexandria, Egypt using the public health system to select 894 cases of VSD and an equal number of controls. The mothers were interviewed and the authors noted that a half hour was dedicated to delineating the family history and detailed drawing of the family pedigree of cases and controls. In this study, the authors outlined the demographics of the case and control groups and described their methods in some detail. Of particular interest was the observation that although the cases were similar to controls in many respects, they were more likely to be rural in residence and they tended to have less education. Interestingly, a history of cousin marriages gave an adjusted odds ratio of 2.38 (95\% confidence interval 1.92–2.96) for VSD. The authors discussed a number of potential sources of bias, including bias in selection, recall, and referral. It was concluded that cousin marriages were associated with an increased risk for VSD, and that further health education could help inform others about the potential effects of inbreeding.

CONCLUSION

Our study concludes that there is an association between cousin marriages and VSD in children presenting to children unit of D.H.Q Hospital Mardan.

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Medico-legal Importance of Personal Identity
(An autopsy based study)

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ABSTRACT:
Background: Personal identification is important both in the living and in the dead. The aim of medico legal autopsy is to determine personal identification.
Study design: This descriptive study is based on autopsy record and provides informations regarding various methods of personal identification.
Duration of study: From 1st January 2013 to 23rd May 2013.
Methodology: This study was conducted in the department of Forensic Medicine & Toxicology of Khyber Medical College, Peshawar. Data was collected from the record of autopsies performed from January 2013 to May 2013. It include all cases referred from urban as well as from rural area police stations of Peshawar district.
Results: Out of total 400 autopsies done 26 postmortem (6.5%) were done on dead bodies which were difficult to recognize due to various reasons.
Conclusion: Aims of autopsy are to find out the personal identification with respect to the area he belonged. What happened to the dead and when it happened, did he reacted or not and to find out any associated crime. An autopsy is helpful in establishing personal identity and in finding out the cause of death, the nature of injury whether it is ante mortem or post mortem.
Keywords: Personal identity, Autopsy, Peshawar.

INTRODUCTION:
Personal identification means the absolute fixation of the individuality of a person whether alive or dead. Forensic medicine is also called state medicine because one of the legal duties of a doctor especially who is working in government sector is to issue medico legal certificate as and when asked by the state and this is one of the professional duties which a doctor is performing for the state. Personal identification is a legal requirement before issue of any type of medico legal report or medical certificate. To prevent professional negligence personal identification is must before blood transfusion and before tooth extraction or any surgical procedure especially when patient is under general anaesthesia. The treating doctor must identify his patient & must know which tooth needs extraction and which organ needs surgical procedure. He must know whether right or left eye/right or left kidney is to be operated to avoid unnecessary surgical involvement.

Personal identification is necessary when a criminal or absconder try to avoid law by changing

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identification like mole, scar or tattoos (6) blood groups (7) from study of iris or (8) by study of DNA. Personal identification of identical twins is confirmed by study of iris and finger prints. Personal identification of dead before autopsy or at exhumation is a legal requirement and it is the duty of police to arrange for one or two identifier of the dead. If only a body part, bone or flesh is brought for autopsy or opinion then precipitin test, number of chromosomes or appearance / morphology will help whether it is of human or of animal origin.

**MATERIAL AND METHOD:**

It is a retrospective descriptive study conducted in the Department of Forensic Medicine & Toxicology of Khyber Medical College, Peshawar where all autopsies are carried out for the district Peshawar. A total of 400 autopsies were performed from 1st January 2013 to 23rd May 2013. All these cases were referred by the police from urban as well as from rural police stations to find out the cause of death and time since dead. How dead body was recognized and by whom it was recognized was also mentioned in the autopsy report. Mode and manner of death or any other crime associated with the death was also noted. Autopsy report was issued to the police and a record of each case was maintained. From this record in a performa information like methods of personal identification, age, sex, from rural or urban area and difficulties, problems faced in personal identification were noted and the results were analyzed as under.

**RESULTS:**

Out of total 400 autopsies performed 26 postmortem (6.5%) were done on dead bodies which were difficult to recognize due to various reasons. Most of the dead bodies referred by police for postmortem were of male, were from rural areas and were in the age group 12 to 30 years. The results are tabulated and analyzed as under;

<table>
<thead>
<tr>
<th>S/No</th>
<th>Post mortem findings on dead body</th>
<th>Age</th>
<th>Sex</th>
<th>No. of cases</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Swollen foul smelling bodies of age about 8 to 11 years with incomplete ligature mark around the neck, eyes and tongue protruding out with skin slip condition and prolapsed rectum. (presumed cause of death was asphyxia)</td>
<td>8 to 11</td>
<td>Male</td>
<td>6</td>
<td>Sex determined from external genitalia and bodies were recognized from dress</td>
</tr>
<tr>
<td></td>
<td>A lacerated wound with friable margin was present on the temporal region of the dead bodies, of age about 20 to 23 years, bodies were swollen and foul smelling with loosening of nails, teeth and hair and all other features of putrefaction were noted. No chemical was detected in the contents of stomach. (Cause of death was fracture of skull)</td>
<td>20 to 23</td>
<td>Male</td>
<td>3</td>
<td>Sex was determined from secondary sex characters and bodies were recognized from mole and scar marks</td>
</tr>
<tr>
<td></td>
<td>Putrefied partially disfigured burnt dead bodies of three females with blackening of the respiratory tract and upper part of oesophagus. No chemical was detected in the stomach contents. (cause of death was ante mortem burns)</td>
<td>21 to 42</td>
<td>female</td>
<td>4</td>
<td>One body was recognized from the extra finger of left hand, one recognized from mole on right cheek, one recognized from scar mark on right knee and one was recognized from the metallic ring which she was wearing in her left hand</td>
</tr>
</tbody>
</table>
DISCUSSION:

THIRTEEN (13) CASES MENTIONED IN SERIAL NO. A WERE DIFFICULT TO RECOGNIZE DUE TO PUTREFACCTON AND WERE RECOGNIZED FROM THE APPARENT AGE, HEIGHT / LENGTH OF THE DEAD BODY, FROM THE DRESS, MOLE AND SCAR MARKS. IN OTHER 13 CASES MENTIONED IN SERIAL NO. B, C & D THE DEAD BODIES WERE FRESH BUT DIFFICULT TO RECOGNIZE DUE TO BOMB BLAST INJURIES, ABSENCE OF FACE OR FACE BADLY CRUSHED UNDER HEAVY WHEAL OF A VEHICLE. THE BODIES WERE IDENTIFIED BY THE RELATIVES/FRIENDS FROM THE DRESS, PERSONAL BELONGING, CONGENITAL DEFORMITIES, DENTAL CAPS, METALLIC RINGS, EXTRA DIGIT OF HAND AND FROM TATTOO MARKS.

It is in the knowledge of a common person that injury or wound on head is a serious injury and may prove fatal so homicidal wounds are more common on head than other parts of body. Homicidal injuries are mostly caused by licensed or unlicensed smooth bore or rifled weapons and these gunshot wounds mainly affect economically productive age group. The current study found peak age group 30 - 39 years.

Medico legal autopsy is not a simple procedure. It is the scientific study of the dead body which is done according to the laws of the state and on the written request of the concerned area SHO. In Pakistan Police is the in charge of dead body and is the investigating authority about death whether it is natural or unnatural. Death may be unnatural but if the concerned police station head officer (SHO) is satisfied that death is natural then he can issue order for burial of the dead. Death may be natural but concerned SHO is not satisfied so he will ask the medical authority for autopsy. Dead body is property of the state hence no consent of any one is required for autopsy. One of the aims of autopsy is determination of sex, age & whether this bone or flesh is human or of an animal. In such cases precipitin test, number of chromosomes and appearance, morphology will help whether it is of human or of animal origin. Study of pelvis in adults is quite helpful in the determination of sex. Age can be determined from teeth, bones and skeleton and in difficult cases Radiologist can help. Finger print expert can help in personal identification both in the living and in the dead. Forensic science laboratory also help in personal identification by checking blood group and by study of DNA and then matching it with the available near relatives of the individual.

It is a fact that no society is ever free of crimes. In developing countries like Pakistan personalities are above the law hence people are most of the time less interested in wasting their time and energy in the lengthy court procedures rather are more interested to take the revenge hence further deteriorating the law and order of the state.

CONCLUSION:

All treating physicians/surgeons must be vigilant not only during surgery but also during blood transfusion. Improvement in the social justice and socio economic condition of people, strict control of weapons and improving education both technical and religious
can save so many precious lives. As court decisions are evidence based and benefit of doubt is given to the accused and it may add to the worries of the relatives of the dead hence all autopsies if done without any unnecessary delay by expert and God fearing doctor on fresh bodies can help a lot in furthering justice. In all difficult cases autopsy findings, forensic science laboratory report and circumstantial evidence as mentioned in police documents must be reviewed and discussed with the senior colleagues.

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Variation in Signs & Symptoms of Acute Appendicitis in Relation to Associated Positions

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ABSTRACT
Background: Vermiform Appendix can be present in various positions in relation to caecum. Classical signs and symptoms of acute appendicitis may differ due to various positions of appendix.

Objective: The objective of this study is to know how appendicitis presents in different positions, and its impact on complications.

Material and methods: This study was conducted in surgical ‘A’ Unit, Mardan Medical Complex from January 2012 to March 2014. The designed of the study was descriptive type. Patients coming to emergency ward were examined after detailed history, investigation and operated. Position of appendix along with other findings were noted.

Results: Patients presenting as acute appendicitis were admitted (100). 68% were male and 32% were female. During surgery the position of appendix was recorded. Retrocaecal position was the most common (78%) cases followed by pelvic position in 16% cases. Perforated appendix was observed in 3 patients (all retrocaecal appendix).

Conclusion: Retrocaecal appendix was the commonest position of Appendix (78%). The signs and symptoms of acute appendicitis in retrocaecal position are disproportionately less severe. Some of those patients suffering from signs and symptoms of mild to moderate severity may be having perforated/gangrenous Appendix.

Key words: Position of appendix, appendicitis, retrocaecal appendix.

INTRODUCTION
Acute Appendicitis is the quiet common disease.¹ Variable position of appendix may produce symptoms and signs related to position and hence can mimic other diseases². Position related variations in signs and symptoms often makes diagnosis difficult. Appendix can be normally found in retrocaecal, pelvic, paracaecal, pre- and post-ileal positions.³ Complications are encountered in those patients whose diagnosis is delayed.

Acute Appendicitis presents as pain in the paraumblical region which shifts to the right iliac fossa. Initial pain in para-umblical area is due to obstruction of appendix while pain in right iliac fossa is due to localized peritonitis. Acute appendicitis is associated with nausea and vomiting. Retrocaecal appendix usually presents with shifting pain to right iliac fossa with nausea vomiting. Tenderness is less in retrocaecal appendix because of cushion effect of gas filled caecum. Low-grade fever is common in appendicitis. High grade fever is not associated with peritonitis. Maximum tenderness is at McBurney’s point. It is junction of lateral one-third with medial two-thirds. In cases of high retrocaecal appendix tenderness may be present much higher to classical area of right iliac fossa and MacBurney’s point. In pelvic position the appendix is touching rectum so minimum tenderness may be present per abdomen. The patient presents with diarrhea. Rectally tenderness is common as examined by digital rectal examination. Perforated appendix causing generalized peritonitis leads to tense tender abdomen with guarding and rigidity. Sometimes the perforated appendix is walled off by omentum resulting in localized peritonitis.

Retrocaecal appendix is the commonest position of appendix (78%). The signs and symptoms of acute appendicitis in retrocaecal position are disproportionally less severe. While some of those suffering from mild to moderate severity, may have perforated/gangrenous appendix.

The signs and symptoms vary not only according to position of appendix but also the state of appendix whether perforated or not. The purpose of this study was to record the various signs and symptoms related to different positions and then to analyze it and extract important information.

MATERIAL AND METHODS
This study was conducted in surgical ‘A’ Unit Mardan Medical Complex from January 2012 to March 2014. Patients coming to emergency ward were examined after taking detailed history. The patient was investigated and ultrasonograms of abdomen were done in all cases. After making final diagnosis of acute appendicitis the patient was included in the study. Patients having generalized peritonitis due to perforated appendix were excluded from the study. After inclusion of patients, his signs and symptoms...
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were recorded in detail. Patients unfit for general anesthesia were excluded from the study. Otherwise patients of every age were included in the study. Those patients having right lower quadrant pain due to other causes than appendicitis were also excluded from the study.

Patients were operated as soon as possible in emergency ward and the position of appendix recorded on the chart. At the end all the results were analyzed, compared and concluded.

RESULTS

A total of 100 patients were examined. Majority of patients, 68% were male while 32% were female (Graph No. 1). Most of the patients (72%) presented with pain right iliac fossa of 1 day duration. Eight (8%) patients presented with pain of 1 week duration (Table No.1). Age range was 13-45 years.

<table>
<thead>
<tr>
<th>Duration</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 day</td>
<td>72</td>
<td>72%</td>
</tr>
<tr>
<td>01 week</td>
<td>08</td>
<td>08%</td>
</tr>
<tr>
<td>02 weeks</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table: NO. 1 Duration at the presentation (n=100)

All of the 100 patients presented with pain right iliac fossa. Forty-five (45%) patients presented with shifting pain from epigastrium (25 patients) and from umbilical region (20 patients). So majority of the patients 55 (55%) presented with non-shifting pain in right iliac fossa. (Table No. 2).

On examination all the patients were having maximum tenderness at McBurney’s point. Eight patients had tenderness above the McBurney’s point (about 4 cm). They had retrocaecal position. Ten patients were having maximum tenderness at McBurney’s point and (4 cm) below. Six patients of them had pelvic appendix while the rest 4 patients were having retrocaecal appendix (Table No. 3).

During surgery retrocaecal position was the most common in 78 (78%) cases. Pelvic position of appendix was the second most common in 16 (16%) cases (Table No.4). Associated conditions found during surgery were pregnancy in one patient and Meckel’s diverticulum in 1 patient. During surgery 3 patients had perforated appendix. (Table No.5).

DISCUSSION

Appendicitis being the most common surgical emergency. Some times accurate diagnosis is hindered by various presentations that differ from typical signs due to position of appendix. A delay in diagnosis and treatment leads to increased morbidity and mortality. The position of appendix has been described as retrocaecal (74), pelvic (27), preileal (1), postileal (05), paracaecal (2).3

Diagnosis of appendicitis is very important as prompt treatment/surgery may decrease the morbidity and mortality. Diagnosis of appendicitis is mostly clinical. With improvement in ultrasound techniques radiologist can diagnose appendicitis. With
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The use of graded compression techniques, they see a blind ended gut loop, with non compressible lumen. Graded compression ultrasonography is one of the new diagnostic technique that is reported to have improved the diagnostic accuracy and clinical outcome. Faecalolith can be seen in the lumen. A diameter of more than 6mm is present in acute appendicitis. Even perforated appendix can be seen as discontinuation of lumen at specific point on ultrasound. In a study conducted by Wiersma F ultrasonoscan was able to see 82% of asymptomatic children’s appendix and they were able to record the position of appendix as well as record the diameter of appendix and see the lumen.

Miki T and associates reported an accuracy of 99% in differentiating acute appendicitis from normal by enhanced multi detector-row CT. They were able to diagnose acute catarrhal 92%, phlegmonous 84%, and gangrenes with 92% accuracy. The finding on CT were appendiceal wall thickness, appendicolith, dirty fat sign localized ascites and abscess formation. Diagnosis of acute appendicitis was mainly supported by CT scan.

Highest CT accuracy has been reported with focused appendiceal CT techniques, which allow immediate patient scanning and minimum patient exposure and cost. The use of CT-scan reduced the number of false positive diagnosis of acute appendicitis with decrease in negative appendicectomy rate from 20% to 4% without concomitant increase in perforation rate. Wiersma reported a sensitivity of 69% and specificity of 97% for perforated appendix. Lin CJ and associates presented a case report of a 64 years old man with rupture of appendix and intestinal malrotation. Patient was diagnosed on CT abdomen as the presentation was atypical features.

Laparoscopy is a safe and effective way of diagnosis acute appendicitis and should be used often. Negelli J and associates concluded that in laparoscopy the diagnostics are more reliable and with diagnostic accuracy of almost 100% unnecessary appendicectomy can be avoided. Laparoscopy diminishes the number of normal appendicectomies; particularly in women of reproductive age where diagnosis may be unclear. The role of laparoscopy in management of complicated appendicitis i.e. gangrenous perforated appendicitis remains undefined. Routine laparoscopy and lap appendicectomy for suspected acute appendicitis is safe and is associated with significant shorter hospital stay.

In our study 68 patients were male and 32 patients were female, age range was 13-45 years. Nazir Ahmad and associates reported position of appendix at laparoscopy. Their results were pelvic 51%, preileal 8%, paracael 3.6%, postileal 22% retrocaecal 20.1%. Their conclusion was that pelvic position is more common rather than retrocaecal. In study conducted by Cleg-Lumptey and associates, their results were 67.3% retrocaecal 1, 21.6% pelvic and 4.9% preileal, 3.8% postileal and 2.4% paracael. They observed that retrocaecal is the most common position and retrocaecal appendix is less prone to inflammation. (cadaveric study revealed 67.37. retrocaecal and acute appendicitis revealed 56.7% retrocaecal position). Golalipour and associates reported position of appendix at laparoscopy. Their results were pelvic 51%, preileal 8%, paracael 3.6%, postileal 22% retrocaecal 20.1%. In our study 72% of patients came to hospital within 24 hours of onset of pain while 8 patients after one week of onset of pain. Regarding symptomatology all of the patients had pain in right iliac fossa and 100% had maximum tenderness at McBurney’s point.

In our study 78% of patients had retrocaecal, 16% pelvic and 3% preileal and 3% paracael. Ahmad and associates reported position of appendix at laparoscopy. Their results were pelvic 51%, preileal 8%, paracael 3.6%, postileal 22% retrocaecal 20.1%. Their conclusion was that pelvic position is more common rather than retrocaecal. In our study conducted by Cleg-Lumptey and associates, their results were 67.3% retrocaecal 1, 21.6% pelvic and 4.9% preileal, 3.8% postileal and 2.4% paracael. They concluded that advanced appendicitis was more common in retrocaecal position. Sheu reported retrocaecal position to be one of the commonest (79%) followed by 21% pelvic. They concluded that advanced appendicitis was more common in retrocaecal position. Sheu BF and associates while studying factors associated with rupture of appendix in elderly concluded that retrocaecal appendix was an important factor along with age, duration of pain, interval of time from admission to surgery and fever. Chan et al were of the opinion that clinicians delay in reaching diagnosis was larger in retrocaecal and retroileal positions.

In our study one patient was 7 months pregnant. There was no maximum tenderness and no shift of position of appendix during. In a study conducted by Hadjati H and kazerooni T also

Figure 1: One of the student groups, presenting their poster on artificial sweeteners.
concluded that no shift in position of appendix was observed in pregnancy. In our study all patients had pain in right iliac fossa, whereas 25% of patients had first pain epigastric before pain R.I.F and 20% had pain peri-umbilical region before pain R.I.F. All the patients were tender at McBurney’s point whereas 8% of patients were also tender 3 cm above the McBurney’s point. All such patients turned out to be having retrocaecal appendicitis. 10% of patients were also tender 4 cm below the McBurney’s point. Among them 4 patients had retrocaecal appendix while 6 patients had pelvic appendix.

In our study 6 patients had repeated episodes of pain R.I.F. All such patients turned out to be having retrocaecal appendix. Three patients presented with perforated appendix and all of them were retrocaecal. Mohammad Ahmad and associates concluded that retrocaecal appendix in addition to making diagnosis of appendicitis difficult, is more prone to infection, perforation and gangrene. There was no mortality in our study.

Huang L was of the opinion that non operative approach was successful in 90% of patients. Lundholm concluded antibiotic treatment to be safe and effective first line therapy with a relapse risk of 15% following initial favorable treatment. Treatment efficacy at one follow up was significantly lower for antibiotics compared to surgery.

**CONCLUSION**

Retrocaecal appendix is the most common position. High retrocaecal appendix is very difficult to diagnosis. Delay in diagnosis leads to more complications especially retrocaecal appendicitis. Key to diagnosis is repeated examination and assessment. As supported by our study retrocaecal Appendix is usually associated by tenderness in region higher than normal. All the patients were tender at Mac Burney’s point. CT abdomen is should be done in every case of the appendicitis if possible. As it tell us not only about inflammation of appendix but also about position, a well planned incision can be given, rather than classical one.

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INTRODUCTION

In the modern world with increase in fast moving vehicles, with growing aged people there has been a continuous rise in the number and the severity of high energy fractures of long bones. Conventional plate and screw osteosynthesis has proved to be very successful in fracture fixation. These techniques require compression of the plate to the bone and rely on friction at the bone-plate interface. This biological pitfalls of biomechanical prerequisite of conventional plates is associated with disturbance of periosteal blood supply and vascularity of the fracture. With increasing axial loading, the friction force decreases and screws can begin to toggle, which leads to plate loosening. Fracture instability will occur, If this occurs prematurely, leading to implant failure.

Locking plates provide excellent fixation in difficult situations like comminuted fractures, osteoporotic fractures and periarticular fractures, if biomechanical principles are followed.

To overcome the drawbacks of conventional plating systems, a newer concept of internal fixation, the locking compression plate (LCP) was introduced to achieve biological internal fixation with relative stability. Locking plates are designed as fixed angled devices. The LCP system consists of a range of anatomically shaped plates with specially designed combination holes. Once locked, these screws can maintain their relative position even under stress with respect to the plate.

The locking screws is particularly useful in osteoporotic bones and its pull-out strength is 4 times greater than the conventional screws, thus providing both axial and angular stability.

The locking compression plate (LCP) system consists of a range of anatomically shaped plates with specially designed combination holes. Once locked, these screws even under stress maintain their relative position with respect to the plate. The pull-out strength of locking screws is 4 times higher than the conventional screws and is particularly useful in osteoporotic bones, thus providing both angular and axial stability.
stability and resistance to screw toggle is provided by screw plate threaded interface which is often regarded as an additional ‘cortex’. FCL techniques provides angle stable construct by maintaining a rigid interface between screw head and plate, while minimizing the stiffness of the screw to facilitate movement at the fracture site and promote secondary healing and callus formation. This prospective study in long bone fractures, use of locking compression plate give better results which would have been associated with high failure rates using conventional plating techniques.

**MATERIAL AND METHODS**

The present descriptive case series study was done on patients with long bone fractures admitted in our hospital at Khyber Teaching Hospital Peshawar from June, 2011 till March, 2015. All patients were evaluated clinically and radiographically at the time of admission. Closed metaphyseodiaphyseal fractures in long bones i.e humerus, radius and ulna, femur and tibia in each gender from 18-80 years were chosen for LCP fixation. Fractures were categorized according to AO/OTA classification. We reviewed 15 femoral fractures, 6 humeral shaft fractures, 12 tibia fractures and 2 radius fractures treated with locking compression plates. Open reduction and internal fixation with locking plate was done with or without image intensifier and bone grafting was done in non-union and some comminuted fractures. Anterior/anterolateral approach with/without radial nerve exploration for humerus and lateral approach for fracture shaft femur was taken. Fracture tibia was approached anterolaterally. All the fractures were fixed with LCPs taking care to protect the periosteal blood supply. Internal fixation in open fractures was carried out after thorough irrigation and debridement. Splintage and immobilization was applied as per fixation achieved. Early range of motion exercises were started where a stable construct was achieved. Regular Follow-up in our series ranged from 6-12 months.

**RESULTS.**

All fractures united in this series without the need for any supplemental procedure. The average time for union in fresh femur fractures was 16.4 weeks. 2 of the 6 non-unions in femur took more than 20 weeks to unite. The average time for union of fresh tibial fractures was 17.1 weeks while the non-unions united in an average of 17.75 weeks. The average time of union for fresh humeral fractures was 13.3 weeks. The union time in non unions ranged from 12 to 20 weeks with a mean of 15.25 weeks. Full weight bearing in cases of fracture tibia and femur was done in 14 cases within 12-16 weeks, 20 cases within 17-20 weeks and in 2 cases after 20 weeks. Range of motion at knee in femoral fractures was more than 90 degrees in 90% of the cases. Range of abduction was more than 140 degrees in 80% of the cases with fracture shaft humerus and elbow flexion was more than 90 degrees in 85% of the cases. Results were unsatisfactory in 2 cases of fracture humerus as both of them were having concomitant injury to the ipsilateral elbow, which hampered early rehabilitation. Evaluation of the results of fracture femur and tibia was done by Modified Melhotra’s grading. According to this grading, 72% of the cases achieved excellent results, 20% fair and 8% poor. In case with humerus fractures achieved 80% satisfactory and 20% unsatisfactory.

**DISCUSSION**

Locking compression plates have been designed to overcome the pitfalls of conventional plates particularly when dealing with difficult problems such as comminuted, metaphyseal and osteoporotic fractures. Locked plates can be used as “bridge plates” to preserve fragmentary blood supply and thus have become a better alternative to conventional plates as they, provide improved fixation with fixed angular stability in osteoporotic bone, and as exact plate-contouring, is not required reduces the risk of primary reduction loss. Locking plates are part of extra-medullary techniques to encourage fracture healing, preserve biology, allow relative stability, and allow early mobilization. Locking plate has a low risk of infection and less blood loss, promotes early mobilization and rapid healing without bone grafting and lower risk of early implant loosening than the dynamic condylar screw. Numerous case series have reported the successful use of LCPs in a variety of clinical situations such as fractures in osteoporotic bones, difficult non-unions, metaphyseal fractures and intra-articular fractures. Literature supports using locking plates for fixation of multi-fragmentary fractures of diaphysis, periarticular fractures of long bones & metaphysis and periprosthetic fractures. With locked fixation, a good purchase between the threaded plate and threaded screw head is achieved. The screws act as pegs resisting axial rotation, translation and bending, in osteoporotic bone. Stoffel et al suggests that long plates should be used to optimise axial stability and to reduce the plastic deformation of the plate when the screws closest to the fracture site are removed. This results because more flexibility is tolerated when the working length of the plate is increased. Gautier and Sommer note that two monocortical screws placed in each main fragment of bone is the absolute minimal arrangement of screws. The bone-screw interface improves If the two monocortical screws are replaced with bicortical screws but there is no improvement in fatigue life. Buttarro et al. used LCP for Vancouver type B1 fractures using open technique. He recommends LCP augmentation with circling wire and strut graft because he noticed 43% implant failure in those fractures where LCP was not augmented. Hazarika et al. Study enrolling 20 tibia fractures showed 10% non-union rate which is more than our result. Miclau et al. bone graft rates of femur fractures ranged between 0% and 87% which is comparable to
our results as we used bone grafts in all femur fractures

10. Literature showed hardware failure in 18% of plate fixation which is almost comparable to our results where we have 11% implant failure 11.

CONCLUSION

In conclusion, locking plates provide excellent fixation in difficult situations like comminuted fractures, osteoporotic fractures and periarticular fractures, if biomechanical principles are followed.

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Effectiveness of Volar Locking Plate Fixation Vs Bridging External Fixation in Unstable Distal Radius Fracture

Dr. Aimal Sattar Khan 1 Abdul Waheed FCPS2. Inam Ullah KhanFCPS3

ABSTRACT
Objective: to compare the effectiveness of open reduction and internal fixation with volar locking plate versus external fixation in the management of unstable distal radius fracture.

Study design: Randomized control trial.

Place and duration of study: Department of Orthopaedics, Ayub Teaching Hospital, Abbottabad.

Patients and methods: Patients were alternatively allocated into two groups A & B. In group A open reduction and internal fixation with volar locking plate was done and in group B external fixation was done. Internal fixation was done by volar locking plate through volar radial (Henry) approach. External fixator with 3.5mm schanz screws was applied with two schanz screw in 2nd metacarpal bone and two schanz screws in radius proximal to fracture site with ligamentotaxis. Radiological outcome was measured after four weeks post operatively using radiological criteria of acceptance for distal radius fracture.

Results: Mean age in group A was 37± 2.76 years whereas in group B was 38± 3.02 years. Efficacy was analyzed as Open reduction and internal fixation with volar locking plate was effective in 88% patients Where as external fixation was effective in 72% patients.

Conclusion: Our study concludes that open reduction and internal fixation with volar locking plate was more effective than external fixation in the management of unstable distal radius fracture.

Key words: Open reduction and internal fixation, external fixation, distal radius fracture.

INTRODUCTION
Fractures of the distal radius are extremely common in which all the age groups are affected. Younger patients often sustain complicated high energy injuries involving the wrist joint, but fracture of the distal radius are also common in older patients who are more likely to sustain low energy fractures related to osteoporosis1. Fractures of the distal radius account for an estimated 17% of all fractures diagnosed. Two-thirds of these fractures are displaced and require reduction. Although extra-articular distal radius fractures are considered to be relatively harmless, inadequate treatment may result in severely impaired function of the wrist2. The consequences of post-traumatic loss of function are comprehensive, both on individual and social level and have long been underestimated3.

The best treatment for these fractures remains unclear. A wide variety of treatments have been described, including conservative treatment with immobilization by casting, closed reduction and fixation with percutaneous Kirschner wires, and other diverse methods for external and internal fixation4.

Open reduction and internal fixation with volar locking plate was more effective than external fixation in the management of unstable distal radius fracture. This technique provides more stable and rigid fixation with less complications.

Closed reduction and casting remain viable options for some non-displaced simple fractures of the distal radius, however the role of external and internal fixation in complex distal radius fractures continues to grow due to their ability to more reliably restore wrist anatomy, minimize immobilization and establish acceptable clinical outcomes5.

Traditionally, the treatment of unstable distal radius fracture involved bridging external fixation and maintaining reduction by applying continuous traction. Recently, the fixed-angle volar plate, used for the fixation of severely impacted fractures of the distal radius, has given encouraging results6.

Volar locking plate is an increasingly popular choice for distal radial fractures, owing to its wider availability and reliability of the locking technology adapted to the wrist2. Variable angle locking screws facilitate column-specific fixation even in osteoporotic bones, and extend the application to a wider spectrum of fractures, with good outcome and few complications8.
Known complications include tendon irritation/attrition/rupture, loss of reduction, and intra-articular screw placement.

The rationale of this study is to determine the effectiveness of open reduction and internal fixation with volar locking plate for unstable distal radius fractures in terms of radiological stability, although external fixation have been used widely as a treatment option for these fractures. There is increasing trend of volar locking plate fixation in unstable distal radius fractures internationally and is widely accepted alternative treatment option in the management of these fractures as this technique provides more stable and rigid fixation with less complications. However this technique is less commonly practiced in our setup as compared to external fixation. There is very little local data available regarding this technique. This study will help to introduce a new technique to our society to take benefit from it and provide a better treatment option to the patients and to provide more rigid and stable fixation with better outcome as compared to external fixation. Data of this study will be shared and compared with local and international available data. **Study design:** It was a Randomized Control Trial.

**METHODS:**

This study was conducted at department of Orthopaedic, PGMI Lady Reading Hospital, Peshawar. Duration of the study was 6 months from Feb 2015 to Aug 2015. Sample size was 67 in each group. All patients ≥ 18 years and ≤ 75 years of both gender having intra-articular displaced distal radius fracture, as classified on lateral, posterior-anterior and lateral carpo-radial radiographs by a radiologist or trauma surgeon were included in the study.

Patients with open distal radius fractures, those who indicate to have had impaired wrist function prior to injury, for example due to rheumatoid arthritis, neurological disorders of the upper limb or previous mal-unions in the affected limb, those suffering from disorders of bone metabolism known to adversely affect fracture healing, such as osteomalacia, those suffering from connective tissue or (joint) hyper flexibility disorders known to adversely affect fracture healing and/or soft tissue and wound healing, those with history of previous wrist fracture and those with extra-articular distal radius fractures were excluded from the study. Informed written consent was obtained from all patients. Detailed history, clinical examination, routine investigations like CBC, ECG, X-ray chest, blood sugar, HBsAg and Anti HCV was done in each case pre-operatively. Patients were alternatively allocated into two groups A & B. In group A open reduction and internal fixation with volar locking plate was done and in group B external fixation was done. Internal fixation was done by volar locking plate through volar radial (Henry) approach. External fixator with 3.5mm schanz screws was applied with two schanz screw in 2nd metacarpal bone and two schanz screws in radius proximal to fracture site with ligamentotaxis.

Radiological outcome was measured after four weeks post operatively using radiological criteria of acceptance for distal radius fracture. Data was analyzed using SPSS version 16. Mean ± standard deviation was calculated for quantitative variable like age between two groups. Qualitative variables like gender and effectiveness of the treatment was presented as frequency and percentages. Effectiveness was stratified between age and gender to see effect modification. Chi-square test was used to compare the effectiveness between group A and B. P value of <0.05 was considered significant.

**RESULTS:**

A total of 134 patients (67 in each group) were observed to compare the effectiveness of open reduction and internal fixation with volar locking plate verses external fixation in the management of unstable distal radius fracture.

Age distribution among two groups was analyzed as in group A 8(12%) patients were in age range 20-30 years, 14(21%) patients were in age range 31-40 years, 15(22%) patients were in age range 41-50 years, 19(28%) patients were in age range 51-60 years, 11(17%) patients were in age range >60 years. Mean age was 37 years with SD ± 2.76. Where as in group B 9(14%) patients were in age range 20-30 years, 13(20%) patients were in age range 31-40 years, 14(21%) patients were in age range 41-50 years, 18(26%) patients were in age range 51-60 years, 13(19%) patients were in age range >60 years. Mean age was 38 years with SD ± 3.02. (as show in table no 1) Gender distribution among two groups was analyzed and is show in table no 2.

Efficacy among two groups was analyzed as group A was effective in 59(88%) patients and was not effective in 8(12%) patients. Whereas group B was effective in 48(72%) patients and was not effective in 19(28%) patients. (as show in table no 3) Stratification of efficacy with age and gender is given in table no 4.5

**TABLE NO 1. Age distribution (n=134)**

<table>
<thead>
<tr>
<th>AGE</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 years</td>
<td>8(12%)</td>
<td>9(14%)</td>
</tr>
<tr>
<td>31-40 years</td>
<td>14(21%)</td>
<td>13(20%)</td>
</tr>
<tr>
<td>41-50 years</td>
<td>15(22%)</td>
<td>14(21%)</td>
</tr>
<tr>
<td>51-60 years</td>
<td>19(28%)</td>
<td>18(26%)</td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>11(17%)</td>
<td>13(19%)</td>
</tr>
<tr>
<td>Total</td>
<td>67(100%)</td>
<td>67(100%)</td>
</tr>
<tr>
<td>Mean and SD</td>
<td>37 years ± 2.76</td>
<td>38 years ± 3.02</td>
</tr>
</tbody>
</table>

Chi square test was applied in which P value was 0.003

**GROUP A:** Open reduction and internal fixation with volar locking plate

**GROUP B:** External fixation
TABLE NO 2. Gender distribution (n=134)

<table>
<thead>
<tr>
<th>GENDER</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48(72%)</td>
<td>47(70%)</td>
</tr>
<tr>
<td>Female</td>
<td>19(28%)</td>
<td>20(30%)</td>
</tr>
<tr>
<td>Total</td>
<td>67(100%)</td>
<td>67(100%)</td>
</tr>
</tbody>
</table>

Chi square test was applied in which P value was 0.003

GROUP A: Open reduction and internal fixation with volar locking plate

GROUP B: External fixation

TABLE NO 3. Efficacy (n=134)

<table>
<thead>
<tr>
<th>Efficacy</th>
<th>GROUP A</th>
<th>GROUP B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td>59(88%)</td>
<td>48(72%)</td>
</tr>
<tr>
<td>Not effective</td>
<td>8(12%)</td>
<td>19(28%)</td>
</tr>
<tr>
<td>Total</td>
<td>67(100%)</td>
<td>67(100%)</td>
</tr>
</tbody>
</table>

Chi square test was applied in which P value was 0.003

GROUP A: Open reduction and internal fixation with volar locking plate

GROUP B: External fixation

TABLE NO 4. Stratification of efficacy with age

<table>
<thead>
<tr>
<th>AGE</th>
<th>Efficacy</th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 years</td>
<td>Effective</td>
<td>8</td>
<td>9</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Not effective</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-40 years</td>
<td>Effective</td>
<td>12</td>
<td>8</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Not effective</td>
<td>2</td>
<td>5</td>
<td></td>
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<tr>
<td>Total</td>
<td>14</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-50 years</td>
<td>Effective</td>
<td>00</td>
<td>00</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Not effective</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>00</td>
<td>00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-60 years</td>
<td>Effective</td>
<td>17</td>
<td>14</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Not effective</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>Effective</td>
<td>10</td>
<td>10</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Not effective</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION:
Fractures of the distal radius are extremely common in which all the age groups are affected. Younger patients often sustain complicated high energy injuries involving the wrist joint, but fracture of the distal radius are also common in older patients who are more likely to sustain low energy fractures related to osteoporosis. Fractures of the distal radius account for an estimated 17% of all fractures diagnosed. Two-thirds of these fractures are displaced and require reduction. A wide variety of treatments have been described, including conservative treatment with immobilization by casting, closed reduction and fixation with percutaneous Kirschner wires, and other diverse methods for external and internal fixation.

Traditionally, the treatment of unstable distal radius fracture involved bridging external fixation and maintaining reduction by applying continuous traction. Recently, the fixed-angle volar plate, used for the fixation of severely impacted fractures of the distal radius, has given encouraging results. Volar locking plate is an increasingly popular choice for distal radial fractures, owing to its wider availability and reliability of the locking technology adapted to the wrist. Variable angle locking screws facilitate column-specific fixation even in osteoporotic bones, and extend the application to a wider spectrum of fractures, with good outcome and few complications. Known complications include tendon irritation/attrition/rupture, loss of reduction, and intra-articular screw placement.

In our study efficacy was analyzed as open reduction and internal fixation with volar locking plate was effective in 88% patients Where as external fixation was effective in 72% patients. Similar results were found in another study conducted by R. Page et al shows 90% effectiveness treated with volar locking plate. Another study conducted by Praveen Anvekar et al shows 70% effectiveness treated by bridging external fixation and ligamentotaxis.

Similar result were also found in another study conducted by Soong M et al in which efficacy was analyzed as open reduction and internal fixation with volar locking plate was effective in 92% patients Where as external fixation was effective in 86% patients. Similar result were also found in another study conducted by Page R et al in which efficacy was analyzed as open reduction and internal fixation with volar locking plate was effective in 90% patients Where as external fixation was effective in 81% patients.

CONCLUSION:
Our study concludes that open reduction and internal fixation with volar locking plate was more effective than external fixation in the management of unstable distal radius fracture.

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effectiveness of volar locking plate fixation vs bridging external fixation in unstable distal radius fracture

ABSTRACT:

Objective: To identify the deficiencies in the training path of our prospective physicians and to suggest solutions.

Study design: Partly interventional longitudinal study.

Place and duration of study: This study was carried out in the Department of Medical Education, Sialkot Medical College during March-April 2016.

Methodology: A meticulous web search was carried out to collect data regarding international strategies being practiced in the training of good physician scientists. It was followed by a survey of 46 volunteer medical students (28 from 1st yr and 18 from 2nd yr). These students underwent a weeklong workshop on the basics of research methodology before carrying out simple research projects. Finally, they were interviewed about their research experience and the insufficiencies in their high school training.

Results: The data revealed some gaps in Pakistani educational system. Pakistani students are not exposed to scientific method early in their educational career. In the students’ survey, the average level of proficiency in math (based on a likert scale) was about 3 corresponding to fair capability. Students were not familiar with data retrieval and interpretation of graphs. During the research workshop, they failed to demonstrate considerable expertise in statistics and basic computational skills required for a good researcher.

Conclusion: The basic requirement of a good researcher include training in research methodology, computational and statistical skills as well as a sound foundation in mathematics. Without this preparation, the students should not be expected to carry out good quality research.

Key words: Medical informatics, Biostatistics, Computers, Premedical education, Information Storage and Retrieval, Research Design

INTRODUCTION

As far as professionalism and dedication is concerned, Pakistan has nurtured doctors who have earned world class reputation, but when it comes to excellence in research and advancement our physicians don’t seem to be shaping the future of medicine. Why is it so? Are we missing something in their training? If we trace their path backwards we see that before entering the medical college they must pass through the premedical level as well as the path from preschool to high school. We have tried to approach the problem by identifying what’s missing at these stages, and what are the tools that a good researcher must acquire before entering a medical school. We have come across a number of imperfections in the educational system. Without a solution, we can never anticipate that our physicians would become first rate researchers. The conventional teaching system prevalent in Pakistan emphasizes on the memorization of facts rather than cultivating intellectual skills. The child having the best recollection ability is considered the most talented and is rewarded throughout his academic career. Unfortunately, the system does not test the problem solving abilities.

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Pakistani system of Education needs to be updated and reorganized. It should be initiated from preschool to high school level through modern approaches like research methods, basic statistics which should be part of premedical curriculum and learning of computational skills. It should be made obligatory for students before entering a medical school. Mathematics should be one of the core subjects for biology students. The medical students who lack training in basic research skills should be offered deficiency courses to overcome their insufficiencies.

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The child dreams of a future, he reaches the institution of his choice but as he advances forward he is confronted with hands on projects and is expected to carry out high quality research. At this stage, his memorization skills are not going to help him, he is terribly confused, although he was previously outstanding in his career, suddenly, he considers himself as a complete failure. As he acquires his professional knowledge, his promotions and elevations...
depend upon the number of publications. If the prospective doctors are not trained in logical reasoning and critical thinking early in their careers, they fail to develop the proficiency needed to become good researchers. Thus, for the minority of individuals in the third world, the drive for research and publication may be to stay at the forefront of knowledge, or to discover new remedies for diseases. However, the crowd may be compelled to do research just to get the promotions and benefits associated with the publications. With this ruined motivation, the quality of research also suffers, he looks for an easy way and direct his energies towards plagiarism mostly observed in the articles.

As new knowledge builds on education and innovation, innovation is based on originality which, in turn, is based on research. While rote memorization is the most ineffective and unproductive way of learning, it is well established that early intervention is the basic prerequisite to promote education and innovation in children.

In this study, we have tried to judge against the level of intervention and the upshot, in the form of progress and perfection, in the leading nations of the world like United States, Australia, as well as our neighbor India. By comparing this with our local standards, we have attempted to assess our position among the exceedingly competitive international community. This article focuses on the deficiencies in our didactic structure that are causing slothfulness and impassiveness in research among our doctors.

Initially, a feeling of curiosity and motivation used to be the only driving forces for new discoveries and research. However, the present day technology demands the researcher to have additional traits. For example, medical informatics has transformed the traditional approaches. There are electronic databases of biomedical literature, genetic data banks, automation of lab experiments and computer based instructional tools. Retrieval of information from databases and computer based analysis of this information is not possible without proper training in the respective skills. Statistics has evolved into a science that has applications in every area together with medicine. Research is not doable without a sound base in data interpretation skills and use of suitable statistical software. We have named these additional requirements, as the “tools of a good researcher”.

**Objectives:**

The objectives of this study included: A search for the deficits in our educational system which may be the cause of low propensity of doctors towards research. Conducting a workshop to teach research methods to medical students and get feedback from them

**Subjects and Methods:**

The study had two parts, for the retrospective longitudinal part, data was obtained from the internet. The educational system of United States, Australia and India was studied in detail. Data was also obtained about their premedical training approaches and components of their respective Medical College Admission Test (MCAT). It was compared with our local system to identify areas where our system needs to be improved.

For the interventional part of the study, a workshop on research methodology, computational and statistical skills was conducted at the Department of Medical Education, Sialkot Medical College. 46 volunteer medical students (28 from 1st yr and 18 from 2nd yr) belonging to medical colleges in Sialkot were recruited into the study. The workshop comprised of 4 modules. In the first module students were introduced to Pub Med and data retrieval from the internet. The second module encompassed sampling and data collection. In the third module, students learnt about graphing and data analysis techniques. The fourth and final module was about writing a poster presentation. The students were then divided into groups of five. Each group was assigned a simple research project. The students spent a month in designing their synopsis and collecting data. They presented the results in a poster competition conducted at Hotel One Sialkot. Finally, the students were asked to fill out a survey form. The survey consisted of a questionnaire about:

The research experience of the students. The proficiency of the students in basic research tools. Deficiencies in their earlier education: Opinion poll about the suggested changes in our educational system. These students were required to fill out a structured questionnaire about their proficiency in basic research tools. The ability in math, statistics and computational skills, was based on a likert scale from 0-5 (zero corresponding to low proficiency and 5 corresponding to expert level). The students themselves rated their adeptness.

**RESULTS:**

Figure 2 presents a comparison between four countries. Unites States and Australia embody the leading nations and India characterizes a struggling nation trying to
catch up with the rest of the world. The vertical axis represents the educational status from preschool to professional level. The bricks symbolize the foundation laid in the form of innovative programs and approaches, at diverse stages of learning. The buildings on top of the bricks correspond to the growth of the respective nation in the form of research and advancement. The positive relationship between the strength of the foundation and the height of the building is easy to follow. The unfortunate Pakistani students suffer a setback because of their feeble foundation.

Fig 3 shows a comparison of our Premed curriculum with that of the US. Our premedical students are not trained adequately in maths, logic, research and statistics. Moreover, in most schools there is a clash between biology and computer studies because of the overlap of class timings and other constraints. So a biology student is not permitted to opt for computer studies.

Based on the Likert scale, the average level of proficiency in math was about 3 corresponding to fair capability. The students lacked considerable expertise in statistics and basic computational skills required for a good researcher (Fig 4).

Figure 5 shows the results of competency of students in scientific information retrieval from the web in comparison to the daily hours spent online. The average time spent on the internet/day was about 3-4 hrs. With few exceptions, the proficiency in information retrieval (based on a likert scale) was only one.

The chart in figure 6 shows the difficulties faced by the students in carrying out research based on their actual understanding and the percentage of students who experienced those difficulties. 80-95% of the students found it hard to choose a topic for research and prepare their synopsis. 70-80% of the students were not comfortable with data graphing and analysis as well as the computational skills needed to retrieve necessary information from the medical literature databases on the internet.

An opinion poll was carried out about the early intervention of novel learning methodologies and modification of premedical set of courses. More than 70% of the students approved the suggested changes in the system.

DISCUSSION:

According to research done at the Center on the Developing Child, Harvard University; the most absorptive stage of learning is before the age of five, a time at which as many as 700 neural connections are being formed per second. Our later learning and performance is based on the structural design of these connections. As stated by Dr Sharon Lynn Kagan (Professor of Early Childhood and Family Policy, Teachers College, Columbia University) in an interview to the children television network.

“..."
The Rationale Behind the Limp Approach of Pakistani Physicians towards Research: is there a Solution?

India is embracing all kinds of educational media to stimulate its young generation. The famous Indian science show “FAQ (frequently asked questions)” broadcasted by POGO TV channel is very popular among kids. Although still preliminary, science fairs are gaining popularity amongst a small percentage of schools across Pakistan. In this pretext, the Pakistan Science Club is an emerging NGO (Non-government Organization) based in Karachi. As a nonprofit group, it motivates interest in science, technology and math by engaging school children in interactive and innovative science activities. Mathematics and biological sciences primarily considered quite disparate disciplines are now interconnected.

“The process of connecting these disciplines should start as early as possible in the educational process, in order to produce prepared minds that will be able to combine both disciplines at graduate and post graduate levels of study.” Internationally, children as young as preschoolers are being introduced to the scientific method. It is a widespread practice in the United States, to invite leading scientists to share their experiences with the preschoolers.

There are many global entrepreneurs who are marketing educational supplies, which are helping young children to experiment, learn and have fun. This kind of stuff is popular among parents and schools in the developed world, but unfamiliar locally. There is also an enormous amount of positive educational stuff that the media is offering to inculcate curiosity, experimenting and reasoning ability in kids. Compared with the global trends, except for a few private institutions, Pakistan is way behind in the area of early childhood education.

At the elementary school level, there are even more prospects to investigate. Hypothesis testing may be introduced at this stage. Leading firms in learning models, like Thames and Kosmos (an international frontrunner in educational kits), are promoting experimentation, critical reasoning and scientific skills among young children by highly engaging and motivating scientific stuff.

With a sound foundation in preschool and elementary level, the high school students can delve into more and more interactive activities. There is a growing trend to engage high school students in research projects, workshops and competitions. Universities customarily invite high school students, and it gives them an opportunity to interact with the actual scientists and the faculty. They can make choices about their career and participate in actual research. Participation in international science Olympiads, which have been extended to countries like Pakistan, can add new dimensions to a student’s science career. US medical schools are now emphasizing that the training of prospective physicians should be started from K-12 level. Long term studies have established that, for every dollar invested in early learning programs there is a big return of dividends. The survey of students, evidently demonstrates the deficits in the training of our premedical students. Despite the fact that the students had access to computers, and spent considerable time online, a significant proportion of students were not familiar with data retrieval and advanced search methods. For most of them it was the first time in their lives that they were involved in some sort of research. Majority of the students failed to figure out what to do with their data. Even when provided help, they had difficulty making and interpreting graphs. Despite spending 3-4 hrs/day on the internet, the students were not proficient enough...
The Rationale Behind the Limp Approach of Pakistani Physicians towards Research: is there a Solution?

in information retrieval. The reason may be the loss of focus because of diversions and attractions on the internet. Whereas few students were quite zealous to learn research methods, majority of them were tense and uneasy.

CONCLUSIONS AND RECOMMENDATIONS:

Pakistan system needs to be updated and reorganized. We have made the following recommendations:
The scientific method should be initiated from pre-school to high school level through modern approaches.

i) Research methods and basic statistics should be part of premedical curriculum.

ii) Learning of computational skills required to accomplish a successful research project should be made obligatory for students before entering medical school.

iii) Mathematics should be one of the core subjects for biology students.

iv) The medical students who lack training in basic research skills should be offered deficiency courses to overcome their insufficiencies.

Acknowledgments:
The authors wish to thank the medical students who volunteered for participating in this study. Despite having little or no previous experience, they worked hard to demonstrate their hidden potential.

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18 Five Numbers to Remember About Early Child Development, Center on the Developing Child, Harvard University. [Internet] 2013.
ABSTRACT:
Background: Personal identification is important both in the living and in the dead an. The aim of medico legal autopsy is to determine personal identification
Study design: This descriptive study is based on autopsy record and provides informations regarding various methods of personal identification.
Duration of study: From 1st January 2013 to 23rd May 2013.
Methodology: This study was conducted in the department of Forensic Medicine & Toxicology of Khyber Medical College, Peshawar. Data was collected from the record of autopsies performed from January 2013 to May 2013.It include all cases referred from urban as well as from rural area police stations of Peshawar district.
Results: Out of total 400 autopsies done 26 postmortem (6.5%) were done on dead bodies which were difficult to recognize due to various reasons.
Conclusion: Aims of autopsy are to find out the personal identification with respect tp the area he belonged. What happens to the dead and when it happened, did he reacted or not and to find out any associated crime . An autopsy is helpful in establishing personal identity and in finding out the cause of death, the nature of injury whether it is ante mortem or post mortem.
Keywords: Personal identity, Autopsy, Peshawar.

INTRODUCTION:
Personal identification means the absolute fixation of the individuality of a person whether alive or dead. Forensic medicine is also called state medicine because one of the legal duties of a doctor especially who is working in government sector is to issue medico legal certificate as and when asked by the state and this is one of the professional duties which a doctor is performing for the state. Personal identification is a legal requirement before issue of any type of medico legal report or medical certificate. To prevent professional negligence personal identification is must before blood transfusion and before tooth extraction or any surgical procedure especially when patient is under general anaesthesia. The treating doctor must identify his patient & must know which tooth needs extraction and which organ needs surgical procedure. He must know whether right or left eye/right or left kidney is to be operated to avoid unnecessary surgical involvement.

Personal identification is necessary when a criminal or absconder try to avoid law by changing or masking his appearance and in case of dead it become necessary to finalize insurance claims and to settle property disputes or to satisfy the relatives by handing over the dead body as in case of air crash. The personal identification of dead can be masked by (1) cutting his/her facial features (2) by putting the dead or unconscious person on rail track so that after being crushed by train his identification becomes difficult (3) by burning the dead body (4) by cutting the dead body into various parts and then throwing various parts of the dead into the river or in a canal/well or by (5) dissolving the dead in acids. Personal identification is not easy in victims of bomb blast. The natural process of putrefaction also make the personal identification difficult for the relatives or friends of the dead to identify him even one week after death as the body weight due to accumulation of gases of putrefaction will become more than 90 KG of a person whose actual weight at the time of death was only 60 KG.

Personal identification of living can be done by family members or friends from appearance and it can possibly be done by anyone from photograph after checking(1) the computerized national identity card or passport(3) from his/her signatures (4) by thumb impression or finger prints(5) from visible marks of identification like mole, scar or tattoos (6) blood groups (7) from study of iris or(8) by study of DNA. Personal identification of identical twins is confirmed by study of iris and finger prints. Personal identification of dead before autopsy or at exhumation is a legal requirement.
and it is the duty of police to arrange for one or two identifier of the dead. If only a body part, bone or flesh is brought for autopsy or opinion then precipitin test, number of chromosomes or appearance / morphology will help whether it is of human or of animal origin.

MATERIAL AND METHOD:

It is a retrospective descriptive study conducted in the Department of Forensic Medicine & Toxicology of Khyber Medical College, Peshawar where all autopsies are carried out for the district Peshawar. A total of 400 autopsies were performed from 1st January 2013 to 23rd May 2013. All these cases were referred by the police from urban as well as from rural police stations to find out the cause of death and time since dead. How dead body was recognized and by whom it was recognized was also mentioned in the autopsy report. Mode and manner of death or any other crime associated with the death was also noted. Autopsy report was issued to the police and a record of each case was maintained. From this record in a performa information like methods of personal identification, age, sex, from rural or urban area and difficulties, problems faced in personal identification were noted and the results were analyzed as under.

RESULTS:

Out of total 400 autopsies performed the dress of 231 cases (58% of total cases) was having red colored stain on it. This stain was encircled and signed by the doctor doing post mortem and on the dress autopsy number was also written and complete dress after obtaining signature of the investigating police officer in the autopsy register was handed over to him to take it to the forensic science laboratory. Most of the dead bodies referred by police for postmortem were of male, were from rural areas and were in the age group 12 to 30 years. In some case police recovered the blood stained weapon like axe, knife or blunt weapon used in killing. The results are tabulated as under;

<table>
<thead>
<tr>
<th>S/No</th>
<th>Post mortem findings</th>
<th>Age</th>
<th>Sex</th>
<th>No. of cases</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| A    | Dead bodies with a wound of entry and wound of exit with red colored stain on dress and some dead bodies having only wound of entry with red colored stain on dress  
(cause of death was firearm injury) | 18 to 27 | 144 Male & 19 Female | 163 | In forensic science laboratory red colored stain on dress proved to be due to blood and this blood was human and of the victim |
| B    | Multiple lacerated wounds on head with red colored stain on dress.  
(cause of death was brain damage with fracture of skull) | 9 Male & 2 Female | 11 | Police recovered two blood stained axe and One blood stained iron bar. The blood was human in origin and was of the victims |
### DISCUSSION:

Thirteen (13) cases mentioned in serial No. A were difficult to recognize due to putrefaction and were recognized from the apparent age, height / length of the dead body, from the dress, mole and scar marks. In other 13 cases mentioned in serial No. B, C &D the dead bodies were fresh but difficult to recognize due to Bomb blast injuries, absence of face or face badly crushed under heavy wheal of a vehicle. The bodies were identified by the relatives/friends from the dress, personal belonging, congenital deformities, dental caps, metallic rings, extra digit of hand and from tattoo marks.

It is in the knowledge of a common person that injury or wound on head is a serious injury and may prove fatal so homicidal wounds are more common on head than other parts of body. Homicidal injuries are mostly caused by licensed or unlicensed smooth bore or rifled weapons and these gunshot wounds mainly affect economically productive age group. The current study found peak age group 30 – 39 years.

Medico legal autopsy is not a simple
procedure. It is the scientific study of the dead body which is done according to the laws of the state and on the written request of the concerned area SHO. In Pakistan Police is the in charge of dead body and is the investigating authority about death whether it is natural or unnatural. Death may be unnatural but if the concerned police station head officer (SHO) is satisfied that death is natural then he can issue order for burial of the dead. Death may be natural but concerned SHO is not satisfied so he will ask the medical authority for autopsy. Dead body is property of the state hence no consent of any one is required for autopsy. One of the aims of autopsy is determination of sex, age & whether this bone or flesh is human or of an animal. In such cases precipitin test, number of chromosomes and appearance, morphology will help whether it is of human or of animal origin. Study of pelvis in adults is quite helpful in the determination of sex. Age can be determined from teeth, bones and skeleton and in difficult cases Radiologist can help. Finger print expert can help in personal identification both in the living and in the dead. Forensic science laboratory also help in personal identification by checking blood group and by study of DNA and then matching it with the available near relatives of the individual.

It is a fact that no society is ever free of crimes. In developing countries like Pakistan personalities are above the law hence people are most of the time less interested in wasting their time and energy in the lengthy court procedures rather are more interested to take the revenge hence further deteriorating the law and order of the state.

CONCLUSION:

All treating physicians/surgeons must be vigilant not only during surgery but also during blood transfusion. Improvement in the social justice and socio economic condition of people, strict control of weapons and improving education both technical and religious can save so many precious lives. As court decisions are evidence based and benefit of doubt is given to the accused and it may add to the worries of the relatives of the dead hence all autopsies if done without any unnecessary delay by expert and God fearing doctor on fresh bodies can help a lot in furthering justice. In all difficult cases autopsy findings, forensic science laboratory report and circumstantial evidence as mentioned in police documents must be reviewed and discussed with the senior colleagues.

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13. Profile of Unnatural Deaths In Bhu (Gujarat): A Retrospective Study Dr.Prithvirajsinh Vaghela, NJIRM 2012; vol .3 (2) April – June
INTRODUCTION:
To promote functional recovery following stroke, the best approach is physical activity based therapies. Specifically, the motor function after stroke can be best facilitated by activities, if they done early after stroke in the intensive manner\[1\]. Despite the knowledge, many studies around the world report that patients spend majority time inactive during rehabilitation services while at the same time they need active and longer duration of treatment with multiple repetitive activities\[2\]. Other investigators had been reported that the stroke sufferers do not maintain functional gains once the rehabilitation services stopped \[3\]. Therefore both the physiotherapist and occupational therapists are facing challenges working in stroke settings as the health care systems emphasizes on efficient and effective management for stroke patients to cope up the phenomena of lost productivity., the group training or circuit training concept is on way to cope this scenario\[4\].

The circuit training program are more satisfactory for stroke patients as compared to individual training programs.

Exercise groups are one way to deliver rehabilitation programs to improve functions or at least maintain after discharge from inpatient rehabilitations\[5\]. In case of circuit classes training the patients are visible to organized stations and they usually provide a task to accomplish within a specific time period\[5\]. The patients multiple attempts with longer treatment time and repetition of activities within these circuits enable patients for neuro-plastic changes in brain and makes patients functionally improve, the philosophy is first described by Car and Shepherd\[6\]. A number of parameters studied in circuit class training like walking distance, gait abilities, lower limb functions, upper limb functions etc. and thus established its overall effectiveness on individual task specific training\[4\]. However the limited number of studies\[7-8\] evaluated patient’s satisfaction with this kind of training program and also the results of these studies cannot be implemented to our setups up-to due to a number of limitation in our setups like females/male concerns of having in a single group and concerns of females to get treatment by female physiotherapist and some other factors like doing exercises

AbSTRACT
Objective: To evaluate the patients satisfaction with circuit class training vs. individual task specific training in g post stroke cases
Study Design: Single blinded randomized controlled trial.
Settings: Fauji Foundation Hospital, Rafsan Paraplegic Center Peshawar/Physiotherapy clinic of Khyber Medical University (KMU), Peshawar.
Material & Methods: Total n=64 participants randomly allocated into two groups using the simple random sampling, circuit group n=32 and individual group n=32. The both group received task specific training individually for 1.5 hour daily for 5 days per week for 4 weeks. The circuit group received task specific training in circuit while the individual group received the task specific training one by one. Total n=2 subjects left the study with mentioned domestic problems. The main outcome measure used for this study was modified patient satisfaction questionnaire.
Result: The patients were considered similar on baseline on the basis of means± standard deviation which was computed for age, length of hospital stay and for 1st physiotherapy visit post stroke. The patient in both the groups, circuit and individual training program reported for equal satisfaction in majority areas of questionnaire where patients in circuit group enjoyed significantly the treatment session as compared to individual group (71% vs. 61 % respectively P<0.05 Chi Square test), The perception of getting improved was significantly high in circuit as compare to individual training group (75% vs. 55% respectively  P<0.05, Chi-Square test) similarly the patients in the circuit groups were comparatively more satisfied with treatment time as compare to individual group (75% vs. 45 % respectively P<0.05 Chi-Square test).
Conclusion: The circuit training programs are more satisfactory for stroke patients as compare to individual training programs.

Key words: Circuit class training, individual task specific training, Physiotherapy after stroke, Motor assessment scale, Rehabilitation after stroke.
in open environment. These all factors created a need to evaluate post stroke patients satisfaction with circuit training program to raise the concern if any they encounters, so that the alternative practices will be preferred in that case specifically to our setups because they might create hurdle in post stroke patient recovery.

**MATERIAL AND METHODS:**
This study was the randomized controlled trial with one month follow up. Simple random sampling technique was carried out for n=64 patients. The main study centers were Rafsan Paraplegic Center, Fauji Foundation Hospital and Khyber Medical University (KMU) Physiotherapy Clinic. The subjects from other setups were invited for the study from their respective medical doctors or physiotherapist. The inclusion criteria for this study was 1) First stroke attack with unilateral deficits 2) Subjects between 3rd - 8th month of stroke 3) Patients with well cognitive status and able to participate in the group and 4) Achieved functional status up-to sitting while exclusion criteria was 1) Lower limb pain ≥3 on visual analogue scale 2) Medically unstable patients having sever joint arthritis or sever cardiac disease 3) received prior physiotherapy for same problem 4) Required as moderate assistance prior stroke as well 5) subjects with memory issues. This inclusion and exclusion criteria made for this study to consider subjects for lower limb strengthening and for balance training. The subjects were given a booklet consisted information regarding circuit trainings and were given the informed consents based on Helsinki ethical considerations.

**Study design and randomization:** Both of the study groups were treated with task specific training for 1.5 hour daily for 4 weeks. Total n=64 patients were randomly allocated to either control or experimental group after informed consent by simple random sampling. The process of randomization ensured by therapists at their own respective sites of data collection and they were the part of study. The patient’s compliances were evaluated by registers which marked patient’s attendance. The attendances were recorded high in the Fauji foundation hospital and in Rafsan Paraplegic Center where patients were admitted. Total n=2 subjects from each group withdrew the study due to their arrival problems at KMU physiotherapy clinic. The subjects in this study were kept blind for the experimental and control nature of the groups.

**Interventions:** The subjects in the control group treated with task specific training individually and subjects in the experimental group treated with task specific training in circuit based works stations. The circuit made for this study consisted mainly for lower limb strengthening and for balance training. (The workstation were 1) ROM exercises for lower limb 2) electrical stimulations 3) theraband exercises 4) exercises with weights 5) lower limb co-ordination exercises 6) sitting static and dynamic balance activities 7) sit/stand 8) standing static or dynamic balance activities 9) stepping, forward/back walk 10) functional reaching 11) gait training in close environment 12) gait training in open environment)[6, 9-11]. The patients started with workstation according to their functional level and also progressed accordingly after he/she cleared with one workstation. The patients practiced each workstation for 15-20 minutes.

**Patient satisfaction:** The patients were invited to fill a questionnaire that was based on patient’s satisfaction with physiotherapy treatments. This questionnaire was aimed to receive a meaningful feedback about the training programs. This questionnaire was same as used by Zanker at al[8], with modification respective to our study and our population.

**Data analysis:** The mean and standard deviation (SD) were calculated for age, length of hospital stay and for 1st physiotherapy visit after stroke. The percentages were calculated for gender and for hemiplegics side for both groups. The Chi-square was applied initially on questionnaire to find the area of significance and then responses to the each question were calculated as percentages. The P-value less than 0.05 considered statistically significant.

**RESULTS:**
Out of 64 patients 60 patients completed the study trial. The mean ± SD for age, length of hospital stay and for 1st physiotherapy visit are given in the Table 1. The percentages for gender and for side of hemiparesis are given in the Table 2. The patients responses to different questions along with their Chi-Square results are given in the Table 3. The areas of significant differences were 1) enjoyment of treatment session where 71 % of patients in circuit group reported that they enjoyed the treatment session, while only 61% enjoyed the treatment session in the individual group (P<0.05, Chi-Square test). Similarly 75% and 55% reported that they are considering improvement in their status in circuit and individual group respectively (P<0.05 Chi-Square test). The patients in circuit group were more satisfied with the amount of time they received by their physiotherapist with the percentage of 75% total as compare to individual group patients where 45% were satisfied and 45 % were not (P<0.05, Chi-Square test).

**Table 1:** Age, 1st Physiotherapy (PT) after stroke, Length of hospital stay (LOST):

<table>
<thead>
<tr>
<th>Variables</th>
<th>Circuit group (n=30) (Mean ± SD)</th>
<th>Individual group (n=30) (Mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of subjects</td>
<td>58.0±3.7</td>
<td>59.8±2.7</td>
</tr>
<tr>
<td>1st PT visit after stroke (in months)</td>
<td>4.57±1.45</td>
<td>4.63±1.35</td>
</tr>
<tr>
<td>LOHS (days)</td>
<td>14.00±2.15</td>
<td>14.13±2.22</td>
</tr>
</tbody>
</table>

**Table 2:** Gender and side of hemiparesis:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Circuit group (n=30)</th>
<th>Individual group (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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DISCUSSION:

The patients in the individual group and circuit group reported for equal satisfaction on majority of concerned areas but the circuit group patients reported for more enjoyment during session, satisfaction for treatment time and for perception of improvement. The subjects in both the groups did not bothered by the gender of physiotherapist, neither by the gender of group fellows, the main concerns for which the circuit training implementation was resisted in some stroke setups of Peshawar. Previously the Zanker et al[8], also reported that 94% patients enjoyed the circuit nature of treatment and according to them 81% considered circuit training beneficial for them. They objectively evaluated that circuit training are time saving and feasible form of treatment. Zanker et al., recruited patients with wide neurological disorders which show some insights for the use of circuit training for the patients other than stroke. English et al[12], repotted for equal effectiveness of individual training program to circuit training program on improving functional balances but however they subjectively reported that patients received circuit training were more satisfied and were more independent in their activities of daily life comparative to individual group. They reported that 45% patients received individual training program were not satisfied with the amount of treatment they received, similar to this trial. However the patients did not treat individually by the physiotherapist in circuit group still their perception of improvement was reported high. As there is always increasing emphasis on the patients satisfaction with treatment within the health care systems, majority of the studies[13-14] were previously reported that stroke patients did not satisfied with rehabilitative care they received.

The more satisfaction, more sense of improvement, more consideration of treatment time were might be due to peer support, visible workstation and due to non fatigable nature of circuit trainings. Nevertheless, the patients satisfaction data collected at the end of trial

Table 3:

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses of circuit group</th>
<th>Responses of individual group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed the treatment sessions</td>
<td>Yes 71%</td>
<td>Uncertain 9%</td>
<td>No 20%</td>
</tr>
<tr>
<td>Was session the fatigable?</td>
<td>20% 15%</td>
<td>65%</td>
<td>22% 17%</td>
</tr>
<tr>
<td>Was the off session time fatigable?</td>
<td>20% 15%</td>
<td>65%</td>
<td>22% 17%</td>
</tr>
<tr>
<td>Did you consider that you are improving by exercises?</td>
<td>75% 11% 14%</td>
<td>55% 20% 25%</td>
<td>0.03</td>
</tr>
<tr>
<td>Did you consider the exercises difficult?</td>
<td>60% 20% 20%</td>
<td>61% 19% 20%</td>
<td>0.1</td>
</tr>
<tr>
<td>Are you bothered by the Gender of physiotherapist?</td>
<td>19% 16% 65%</td>
<td>22% 17% 61%</td>
<td>0.08</td>
</tr>
<tr>
<td>Are you satisfied with timings allotted to you by your physiotherapist?</td>
<td>71% 10% 19%</td>
<td>71% 9% 20%</td>
<td>0.9</td>
</tr>
<tr>
<td>Did you find the environment noisy during treatment?</td>
<td>19% 16% 65%</td>
<td>22% 17% 61%</td>
<td>0.09</td>
</tr>
<tr>
<td>Are you satisfied by the amount of time you are receiving by your physiotherapist?</td>
<td>75% 10% 15%</td>
<td>45% 10% 45%</td>
<td>0.00</td>
</tr>
<tr>
<td>Do you encounter any pain during or after treatment sessions?</td>
<td>9% 16% 75%</td>
<td>12% 17% 71%</td>
<td>0.09</td>
</tr>
<tr>
<td>Did you bothered by the open environment exercises?</td>
<td>20% 15% 65%</td>
<td>21% 17% 62%</td>
<td>0.07</td>
</tr>
</tbody>
</table>

P value is obtained from Chi-Square test, the bold values shows area of significant differences
Patient’s Satisfaction with Circuit Class Training vs Individual Task Specific Training in Post-Stroke Cases

al, the long follow up might be more scientific reflection than measured during in patient’s treatments, because at that time the patients might be resultant expressing their dissatisfaction with physiotherapy or hospital services[15].

Study limitation: This study only blinded the patients for group nature of the study, while the therapist and assessor were still not blinded, also there was sample bias as well as patients referral from other site were depended on physician referral. The patient’s satisfaction questionnaire was unknown validity and reliability score used in this study. The sample size of 64 patients is small to implement the results of this survey on all stroke population. The patients of only specific time duration of post stroke were taken and the survey was only conducted on the patients received balance training and lower limb strength training, this creates a need for future studies to generalize the results on all stroke population.

CONCLUSION:
The circuit training program are more satisfactory for stroke patients as compared to individual training programs.

REFERENCES:
Awareness & Frequency of Hepatitis B Vaccination in High-Risk Health Care Workers at Swabi District, KPK

Jawad Khan, FCPS (Gastro & Hepat), 1 Muhammad Daud, FCPS (Gastro), 2 Waheed ullah, FCPS (Gastro), 3 Noor ul Amin FCPS (Gastro) 4, Fakhr-e-Alam FCPS (Gastro) 5

ABSTRACT:

Objectives: to assess awareness of high risk health care workers about being at risk of contracting Hepatitis B and importance of vaccination for them and to determine the effectiveness of hepatitis B vaccination amongst them.

Methodology: a multicenter cross sectional study was done at different hospitals of Swabi like DHQ, THQ, and RHC. Anti HBs were checked to assess the efficacy of vaccination. Questioner was administered to record the frequency of vaccination, immunity and there awareness of risk associated with Hepatitis B and protective role of vaccination.

Results: out of 140 patients, 95 patients were aware of being at high risk for acquiring HBV infection and the role of vaccination against HBV. Only 70 patients have done vaccination against HBV, 65 patients had anti HBS titer above protection level while 5 patients has undetectable level of titers.

Conclusion: A significant proportion of patient lack awareness of vaccination or immunization against hepatitis B.

Key Words: Hepatitis B Virus, Vaccination, Health Care Workers

INTRODUCTION

Hepatitis B infection is a global pandemic and currently about 350 million people are infected or carrier in the world. The prevalence of HBV carriers varies from lowest in Japan (0.0005%) to highest in areas like South East Asia, China sub-Saharan Africa, India and Pakistan. Pakistan lies intermediate to high prevalence areas. According to a study in Lahore the prevalence of HBV is about 3 to 5% in South Punjab.

By virtue of occupation, health care workers are placed in constant danger of acquiring HBV infection through multiple sources. It is the most commonly transmitted as blood born infection. Nosocomial transmission can be prevented by vaccination of these health care workers. The hepatitis B vaccination provides protection against this infection. In USA, vaccination of all health care workers has been recommended. Even despite these recommendations, a lot of health care workers are at danger of acquiring this infection due to lack of vaccination. The reason include lack of awareness, cost of vaccine, belief that the spread of infection cannot occurs with gloves and masks, non-professional attitude, malpractices, weak policies and inconsistent enforcement of rules regarding immunization of health care workers, desire to avoid medications and possible side effects of medications. Despite the high efficacy of vaccine, immunity cannot be achieved in 5 to 21% percent people. The purpose of this study is to assess the awareness of high risk health care workers regarding contracting hepatitis B, importance of vaccination and to determine the effectiveness of vaccination.

A significant proportion of patients lack awareness against vaccination or immunization against hepatitis B. vaccination in high-risk health care workers at Swabi District of KPK. Efforts should be made to create awareness of this disease at gross route level.

METHODOLOGY

This cross sectional study was carried out in different hospitals of Swabi District KPK like DHQ, THQ, and RHC AND BHU from January 2016 to January 2017. It was approved by ethical committees of the hospital. All the participants gave their written consent. Selected high risk health care workers who had been working in high risk setting for at least 6 months were included in study by means of conveniet sampling. Workers who gave history of HBV infection or who cannot agree to get there immunity status checked were excluded from the study.

High risk health care workers were defined as hospital staff exposed to greater risk if acquiring HBV infection due to specific nature of a job like medical officers, house officers, nurses, medical technicians, san-
itary workers, lady health workers working in surgery and allied specialities, medicine, gynecology & obstetrics operation theaters, emergency receptions, intensive care units, hemodialysis units and dental units. Effectively vaccinated subjects were defined as those who received three doses of vaccination according to schedule (0, 1 and 6 months). The immunity status of subjects was then confirmed by measuring anti HBS titers. Non vaccinated subjects were defined as those who were not vaccinated against hepatitis B or their HBsAb antibody titers remains negative after following vaccination (labeled as non-responders). Awareness of risk was defined as high risk care workers who recognized that they were at high risk for contracting Hepatitis B infection and realizing that vaccination is very effective in preventing infection. Study participants were then interviewed by research team. The interview included pertinent personal details, awareness of being at high risk for acquiring hepatitis B infection. Those who were vaccinated were requested to give 3 cc of blood sample. The unvaccinated subjects were only requested to fill the data collection questionnaire. Data analysis was done using SPSS v 10.0

RESULTS

140 patients were included in study, of which 125 were males and 15 were females. The mean age was 32 years and duration of service was 7.5 years.

Tab: 1 Designation of health care workers and their awareness of being at risk for HBV infection and role of vaccination.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Number</th>
<th>Percent-age</th>
<th>Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Medical officers</td>
<td>35</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>House officers</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Nurses</td>
<td>25</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Medical technicians</td>
<td>15</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Sanitary workers</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>LHV</td>
<td>25</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Dental technicians</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>140</td>
<td>57</td>
<td>83</td>
</tr>
</tbody>
</table>

Out of total 140 health care workers, 57 were aware of being at high risk for acquiring HBV infection and the importance of vaccination in preventing HBV infection in them while 83 people were completely unaware of this.

Mean antibody titer was 115.6 u/l. The minimum protection limit was considered as 10 u/l. among them 57 people were vaccinated against hepatitis B and they all were well aware of being at high risk of acquiring hepatitis B and the importance of vaccination against prevention of this infection. 52 persons were effectively vaccinated against hepatitis B (had protective level of HBS antibodies), while 5 patients were non-responders i.e. they have undetectable levels of antibody despite vaccination. In them, 83 persons were not vaccinated against hepatitis B. out of these 56 patients were not fully aware of danger of contracting hepatitis B and role of vaccination in prevention of this infection. Thus total non-vaccinated as per operational definition were 87 person which include 83 non vaccinated and 5 non responders. In above study, people like sanitary workers, dental and medical technicians were amongst the highest who were not vaccinated.

Table 2: Designation vs. Vaccination/ Immunity Status (n=140)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Vaccination</th>
<th>Immunity status</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>non</td>
<td>vaccinated</td>
<td>Effectively vaccinated</td>
</tr>
<tr>
<td></td>
<td>Not</td>
<td>Non</td>
<td></td>
</tr>
<tr>
<td>Medical officers</td>
<td>4</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>House officers</td>
<td>3</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Nurses</td>
<td>19</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Medical technicians</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sanitary workers</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LHV</td>
<td>22</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Dental technicians</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>5</td>
<td>52</td>
</tr>
</tbody>
</table>

DISCUSSION

Our discussion observes the level of awareness, education and social status on vaccination against HBV in high risk health care workers. Although with higher vaccination coverage the observation has been noted in USA. A study from Nepal, only 49 percent of health care workers were vaccinated against HBV. A study from Lagos shows highest numbers of HBV carriers were sweepers and ward boys followed by nurses and medical technicians. Similar results were showing the same trends from Nigeria. Our data also suggest the level of education and law enforcements are essential for safety of HCW. A recent study shows a significant improvement in hepatitis B vaccination coverage in high risk educated people with use of educational video. We believe this finding reflects on the awareness as well as socialized and educated class of society.

Another factor for vaccination is high cost of vaccination in high risk population. A study from Aga Khan University shows higher rate of vaccination because of availability of free vaccination. In our study of all non-responders were aware of their immunity status while some of them do not believe that even after complete vaccination course, they were confident of being successfully immune against HBV infection.
their personal history factors like immune-suppression, renal failure or bone marrow disease etc., could be responsible for failed vaccination, were not present19.

In recent Pakistani study, about 58% workers were vaccinated against HBV and study concluded that attitude and awareness were the main component for non vaccination20. In another study that was conducted on various medical students in different medical colleges of Karachi, only 70 percent of students were completely vaccinated against HBV and about half of the students have good knowledge about the routes of spread of hepatitis B21. Our study suggest that efforts should be made to create awareness of this disease at gross level too.

Except for doctors, who got vaccinated at their own expense, the remaining staff was vaccinated free of cost or at subsidized rates by the institution. This data, therefore, may not be extrapolated to estimate vaccination frequency in healthcare workers in their national health institutions. Moreover, the frequency of post vaccination anti HBs titers on institutional expense as a routine procedure may not be accessible to all health care workers. These workers usually remain unaware of the importance of post vaccination testing. This is also reflected by the fact that very few institutions have collected data on post vaccination immunity status of their high risk workers20. Therefore, result of these study my not reflect the post vaccination immunity status in other national institutions.

CONCLUSION:
A significant proportion of patient lack awareness against vaccination or immunization against hepatitis B. Efforts should be made to create awareness of this disease at gross route level.

1. REFERENCES
Effectiveness of Anterior Subcutaneous Transposition of Ulnar Nerve amongst the Patients Presenting with Idiopathic Compression Ulnar Neuropathy.

Aimal Sattar Khan FCPS¹ , Abdul Waheed FCPS² Inam ullah Khan FCPS³

ABSTRACT:
Objective: To determine the effectiveness of anterior subcutaneous transposition of ulnar nerve among the patients presenting with idiopathic compression ulnar neuropathy.
Study design: Descriptive case series study.
Patients and Methods: A total of 93 patients were observed. All patients were subjected to anterior subcutaneous transposition of ulnar nerve under general anesthesia. All the surgical procedures were performed by single experienced orthopaedic surgeon. All patients were followed up at the end of 1 month to determine intervention effectiveness in terms of both reduction of pain by at least 2 grades from baseline and improvement in MRC grading by at least 2 grades from baseline at presentation.
Results: A total of 93 patients with idiopathic compression ulnar neuropathy were observed, in which male to female ratio was 2.72:1. Average age was 43.84 years ± 1.07SD. Efficacy of anterior subcutaneous transposition of ulnar nerve in the treatment of idiopathic compression ulnar neuropathy was 56(60.22%) while in 37(39.78%) were found non-effective results.
Conclusion: Anterior subcutaneous transposition of ulnar nerve is the effective procedure for the treatment of idiopathic compression ulnar neuropathy.
Key Words: Anterior subcutaneous transposition, idiopathic compression, ulnar neuropathy.

INTRODUCTION:
Ulnar neuropathy at the elbow is the second most frequent focal peripheral neuropathy of the upper limb after carpel tunnel syndrome.¹ It has been recognized over 100 years.² A study revealed that in 2000 the annual age standardized rates per 100,000 of new presentations of compressive ulnar neuropathy in primary care were 25.2 in men and 18.9 in women. In this neuropathy focal entrapment of the ulnar nerve occurs in the region of elbow at the ulnar groove or beneath the humero-ulnar aponeurosis.³ It is the cause of considerable pain and disability for patients.⁴ They typically present with weakness or atrophy of the hand as well as paresthesia in the ulnar nerve distribution area.⁵ The most common cause of ulnar neuropathy is idiopathic.⁶ Elbow trauma, cubitus valgus deformity and prolonged flexion of the elbow are recognized risk factors for ulnar nerve entrapment.⁷
Conservative treatment may not relieve symptoms associated with this neuropathy.⁸ Although surgery for ulnar neuropathy is effective,⁹ there is currently no consensus on the optimal operative treatment for this neuropathy.¹⁰ Different surgical options include simple decompression of ulnar nerve, medial epicondylectomy, subcutaneous, submuscular or intramuscular anterior transposition of the ulnar nerve.¹¹

Subcutaneous transposition of the ulnar nerve for the surgical treatment of cubital tunnel syndrome is a reliable and easy method with a low complication rate and should be preferred for its mechanical advantage in solving the nerve traction problem.

The anterior subcutaneous transposition of ulnar nerve has been found to be an effective and safe procedure for treating compressive ulnar neuropathy.¹² It also offers an alternative to other surgical procedures because of its simplicity and quicker recovery time.¹³ Anterior subcutaneous transposition of ulnar nerve was with 70.83 % rate of effective result in a study conducted by Mackinnon.¹⁴ In another study 41% of cases showed effective results,¹⁵ while Mitsionis GI, et al showed efficacy in 62% of patients.¹⁶

The aim of this study is to determine the effectiveness of anterior subcutaneous transposition of ulnar nerve in idiopathic compressive ulnar neuropathy in terms of reduction of pain and improvement of motor activity. In my study if subcutaneous transposition is found effective in significant number of patient
and comparable to other studies then I will suggest subcutaneous transposition of ulnar nerve as first line treatment strategy in all patients with compressive ulnar neuropathy. Also the current study will give us local statistics in terms of its effectiveness keeping in view the variable results shown by different studies in the literature.

METHODS:

Study was conducted at department of Orthopaedics, Lady Reading Hospital, Peshawar from 21st May 2012 to 21st Nov 2012. All patients of idiopathic compressive ulnar neuropathy with moderate to severe pain on visual analogue scale and motor activity < 3 on MRC grading between the age group 20-60 years of either gender were included in the study. Diabetic ulnar neuropathy as detected by history, clinical examination and past medical records, patients with history of previous surgery for compressive ulnar neuropathy and patients with history of trauma to the upper limbs were excluded from the study. All patients were subjected to detailed history with clinical examination and routine investigations were done in all patients. All patients were subjected to anterior subcutaneous transposition of ulnar nerve under general anesthesia on the next OT day. All the surgical procedures were performed by single experienced orthopaedic surgeon. Post operatively all patients were followed up at the end of 1 month to determine intervention effectiveness in terms of both reduction of pain by at least 2 grades from baseline and improvement in MRC grading by at least 2 grades from baseline at presentation. All the above mentioned information including name, age, and gender was recorded on a pre designed proforma. Strictly an exclusion criterion was followed to control confounders and bias in the study results. Data were analyzed in SPSS version 10 for windows. Mean ± SD were calculated for quantitative variable like age. Frequency and percentages were calculated for categorical variables like gender and effectiveness. Effectiveness was stratified among age, gender, baseline pain grade and baseline MRC grade to see the effect modifications. All the results were presented in the form of tables and graphs.

RESULTS:

In this study, 93 patients with idiopathic compression ulnar neuropathy, in which 68(73.12%) were male and 25(26.88%) were female patients. Male to female ratio was 2.72:1. Patients’ ages were divided in four categories, out of which most presented in older age i.e. more than 51 years which were 33(35.5%) while 16(17.2%) patients were in the age of less than or equal to 30 years, 16(17.2%) were of age range 31-40 years and 28(30.1%) presented at age of 41-50 years. The study included age ranged from 24 up to 59 years. Average age was 43.84 years ± 1.07SD.

Status of baseline pain was analyzed as 48(51.61%) patients had pain score 2 and 45(48.38%) patients had pain score 3 while after follow up 29(31.18%) patients had pain score 0, 27(29%) patients had pain score 1, 22(22.5831.18%) patients had pain score 2 and 16(17.20%) patients had pain score 3. (Table 1) Status of baseline power at presentation and at follow is shown in Table 2. Efficacy of anterior subcutaneous transposition of ulnar nerve in the treatment of idiopathic compression ulnar neuropathy was 56(60.22%) while in 37(39.78%) were found non-effective results. (Table 3).

Age wise stratification shows that almost same efficacy was found in all age group, efficacy was 10(62.5%) in patients having age less or equal to 30 years while 6 (37.5%) were not effective, 10(62.5%) patients showed efficacy in age groups of 31-40 years while in 6 (37.5%) were not effective. In 16(57.1%) patients efficacy was observed in the age range of 41-50 years while 12(42.9%) were not effective and 20(60.6%) cases gave effective outcomes in age range of more than 50 years of age while 12(42.9%) were not effective. (Table 4)

Gender wise distribution of efficacy also shows no effect modification. There were 41(60.3%) male patients shows efficacy while in 27(39.7%) were not effective and 15(60.0%) female patients efficacy was observed while in 10(40%) female patients shows no efficacy.

<table>
<thead>
<tr>
<th>PAIN SCALE</th>
<th>PAIN GRADE AT PRESENTATION</th>
<th>PAIN GRADE AT FOLLOW UP</th>
<th>EFFICACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nil 0</td>
<td>29 31.18</td>
<td>Effective</td>
</tr>
<tr>
<td>1</td>
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<td>27 29.03</td>
<td>Effective</td>
</tr>
<tr>
<td>2</td>
<td>48 51.61</td>
<td>21 22.58</td>
<td>Ineffective</td>
</tr>
<tr>
<td>3</td>
<td>45 48.38</td>
<td>16 17.20</td>
<td>Ineffective</td>
</tr>
<tr>
<td>TOTAL</td>
<td>93 100</td>
<td>93 100</td>
<td></td>
</tr>
</tbody>
</table>

**TAB: 2 Baseline and follow up details of power (n=93)**

<table>
<thead>
<tr>
<th>GRADE</th>
<th>POWER GRADE AT PRESENTATION</th>
<th>POWER GRADE AT FOLLOW UP</th>
<th>EFFICACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 0</td>
<td>0 0</td>
<td>Ineffective</td>
</tr>
<tr>
<td>1</td>
<td>40 43.01</td>
<td>20 21.50</td>
<td>Ineffective</td>
</tr>
<tr>
<td>2</td>
<td>53 56.98</td>
<td>17 18.27</td>
<td>Ineffective</td>
</tr>
<tr>
<td>3</td>
<td>nil 0</td>
<td>32 34.40</td>
<td>Effective</td>
</tr>
<tr>
<td>4</td>
<td>nil 0</td>
<td>24 25.80</td>
<td>Effective</td>
</tr>
<tr>
<td>5</td>
<td>nil 0</td>
<td>nil 0</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>93 100</td>
<td>93 100</td>
<td></td>
</tr>
</tbody>
</table>
Effectiveness of Anterior Subcutaneous Transposition of Ulnar Nerve amongst the Patients Presenting with Idiopathic Compression Ulnar Neuropathy.

TAB: 3 Efficacy (n=93)

<table>
<thead>
<tr>
<th>EFFICACY</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td>56</td>
<td>60.22%</td>
</tr>
<tr>
<td>Not effective</td>
<td>37</td>
<td>39.78%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>93</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

TAB:4 Association of efficacy with age distribution

<table>
<thead>
<tr>
<th>AGE (YEARS)</th>
<th>Efficacy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>≤ 30.00</td>
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<td>6</td>
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<td>31.00 - 40.00</td>
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<td>41.00 - 50.00</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>≥ 51.00</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>37</td>
</tr>
</tbody>
</table>

DISCUSSION:

The optimal surgical treatment for compressive neuropathy of the ulnar nerve at the elbow is unclear. Factors that may influence the choice of a particular technique include the etiology of the neuropathy, severity of patient symptoms, presence or absence of subluxation of the ulnar nerve, and individual surgeon preference. Ulnar nerve entrapment at the elbow, the cubital tunnel syndrome, is increasingly recognized as a source of upper-extremity sensory and motor symptoms. The treatment for nerve compression is the decompression of the nerve.

Surgical treatment options include open and endoscopic simple decompression, decompression with medial epicondylectomy and anterior transposition of the nerve (subcutaneous, intramuscular or sub-muscular). The anterior subcutaneous transposition of ulnar nerve has been found to be an effective and safe procedure for treating compressive ulnar neuropathy. It also offers an alternative to other surgical procedures because of its simplicity and quicker recovery time. Anterior subcutaneous transposition of ulnar nerve was with 70.83 % rate of effective result in a study conducted by Mackinnon SE. In another study 41% of cases showed effective results. While Mitsionis GI, et al showed efficacy in 62% of patients.

Numerous comparison studies have been made to investigate the most appropriate technique in the surgical treatment of cubital tunnel syndrome and technical selection according to preoperative classification and clinical findings. Most of these studies used the classification system defined by McGowan in 1950 which is based predominantly on the loss of motor function and does not include sensory changes. However, the majority of patients have mainly sensory complaints and motor function impairment occurs in advanced phases. McGowan’s classification system was modified by Goldberg et al.

While patients with mild to moderate symptoms with a short duration usually undergo simple decompression, patients with severe symptoms with a long duration usually undergo anterior transposition, with favorable results in both groups. In our series, the success of the operation in patients who had symptoms of a duration of less than 6 months was statistically higher than the others (p<0.05), which implies that the longer the onset of symptoms, the less the success of surgery. Dellon reported that patients with minimal nerve compression obtained excellent results with any surgical procedure. Simple decompression, however, was rarely successful in patients with moderate compression. The efficiency of in situ decompression and partial epicondylectomy were reported to be similar while anterior subcutaneous transposition lacked the efficiency of the other two methods.

In a study by Hahn et al, in which the groups had a similar duration of symptoms, the clinical results of the ulnar nerve decompression with minimal medial epicondylectomy and anterior subcutaneous transposition of the ulnar nerve were similar in spite of the preoperative Dellon’s grade at the final follow-up. However, they stated that there were statistical differences between the two groups in terms of the incision length and procedure-related morbidities in favor of the epicondylectomy group.

Subcutaneous anterior transposition of the ulnar nerve is frequently performed as it is a simple procedure with a high success rate and very few complications. Morbidity due to subcutaneous transposition is clearly less when compared to submuscular or intramuscular procedures. In a comparative study of submuscular and subcutaneous transposition of the ulnar nerve for cubital tunnel syndrome, sensory and motor recovery for patients with McGowan grades 2 and 3 were similar following submuscular and subcutaneous transposition techniques.

Furthermore, no immobilization is necessary after anterior subcutaneous transposition as no muscle or bone intervention is carried out. We did not use postoperative immobilization because early mobilization of the elbow permits early gliding of the ulnar nerve, which prevents the perineural fibrosis that occurs if mobilization is delayed to the second or third postoperative week. It is shown that early mobilization also reduces the return-to-work period.
of continued pain after cubital tunnel surgery. The medial antebrachial cutaneous nerve may be injured or transacted during exposure of the ulnar nerve. Careful dissection at the time of the original surgery is key to preventing nerve injury. The deterioration in ulnar nerve functions is probably due to devascularization of the nerve. We did not observe any of these complications in our patients. None of the patients developed ulnar nerve paralysis, subluxation, or flexion contracture of the elbow. Incisions should be in front of the medial epicondyle in order to protect medial antebrachial cutaneous nerve.

We observed that the mid- and long-term results were excellent in patients who underwent subcutaneous anterior transposition of the ulnar nerve. No ulnar nerve paralysis developed and none of the patients showed deterioration of the ulnar nerve functions when compared to the preoperative period. The patient with the poor result had a crush injury of the elbow and underwent simple decompression of the ulnar nerve twice and had scarring of the nerve, implying an intrinsic damage of the nerve. Caputo and Watson reported 75% excellent results with secondary subcutaneous anterior transposition. Although these results are less favorable than those for the primary procedure, submuscular or subcutaneous anterior transposition provides most patients at least partial pain relief.

CONCLUSION:
Subcutaneous transposition of the ulnar nerve for the surgical treatment of cubital tunnel syndrome is a reliable and easy method with a low complication rate and should be preferred for its mechanical advantage in solving the nerve traction problem.

REFERENCES:
ABSTRACT:
Objectives: To document preferred recovery with Ilizarov External Fixation in proximal Tibial Plateau fracture.
Material and Methods: 60 patients with tibial plateau fracture above 14 years of age.
Result. Radiological union was present in 29 (48.3%) patients after one month and they achieved full weight bearing at 6 months' time. Pin track infection was found in 17 patients (28.3%) in first month, which slightly increased in 3 months (35%) but at 6 month follow up pin track infection was not found in any patients.
Conclusion: We concluded that Ilizarov fixation is a good technique which gives good pain relief, early mobility, early radiological union and minimal knee stiffness. It also gives good results in cases where primary internal fixation cannot be done. It can be used even in the presence of edema. Success of the treatment lies in continuous patient education.
Keywords: Proximal tibial plateau fracture, Ilizarov external fixation, open reduction and follow up.

INTRODUCTION:
In the present era of fast vehicles and fast life style, tibia and fibula are the bones which are frequently subjected to high energy trauma. The proximal tibial is injured intra articularly in 1 % of these cases. Proximal tibial fracture are especially challenging because of their complexities. Tibial plateau fractures involve the knee joint and usually result from axial loading in combination with varus or valgus stress forces. Most common causes of these fractures are fall from height and road traffic accidents.

The fractures around the knee are usually caused by severe violence and are very often associated with life threatening situations. Open fracture and neuro vascular problems make it difficult to handle these injuries with uncertain outcome. Most common complications that occur with tibial plateau fractures are compartment syndrome, neurovascular injuries, chronic osteomyelitis, Mal-union, deformity and joint stiffness.

Particular fractures with extension into the joint are quite difficult to manage, have a high rate of post-operative soft tissue complications and can lead to post traumatic arthritis. Over last several years, orthopedic surgeons have begun utilizing minimally invasive techniques or closed reduction maneuvers in order to avoid soft tissue trauma and peri osteal stripping of the fracture fragments to maintain their blood supply. The difficulty arises how to best stabilize the fracture after reduction with the use of Ilizarov external fixation.

Ilizarov fixation is a good technique giving good relief of pain, early mobility after radiological union and minimal knee stiffness. It is also very useful in cases where primary internal fixation cannot be done, even in the presence of swelling.

MATERIAL AND METHODS:
This was a prospective observational study of 3 years duration carried out from Sept 2012 to Sept 2015 in the orthopedic department of District Headquarters Hospital Swabi. Total of 60 cases were selected. the exclusion criteria All patients below the age of 14 were excluded. (more than 2, were mentally retarded, any chronic illness disease, immune suppressive condition and unwilling for external fixation. Those with depressed with tibial plateau fracture and above the age of 14 years and willing for this procedure were included. Demographic characteristics like name, age, sex, address of all patients were recorded.
Complete history was taken and complete general physical and systemic examination was done. All patients were pre operatively prepared by doing mandatory investigations. Fracture was reduced and reduction checked under C-ARM or X Ray control after satisfactory reduction achieved. Assembled Ilizarov fixation was passed over the injured limb. The assembly included a C ring and 3 to 4 complete rings. C ring was used close to the knee joint for the mobility and the complete rings were used distally. One C and one complete or both all data analyses were performed using the SPSS progress (version12). The clinical follow up of pain, swelling, range of motion, radiology union any technical problem like pin track infection and knee stiffness were tested for significance by applying Chi square test and duration of operation was tested for significance by applying student ‘t’ test. The P value < 0.05 was considered as significant.

**Fig 1:** Injury x-ray of the patient of tibial plateau fracture

**Fig 2:** X-ray of the patient of tibial plateau fracture after surgery

**Fig 3:** X-ray of the patient of tibial plateau fracture healed

**RESULTS:**

The mean age of the patient was 38.52 ± 10.9 years. There were 57 (95%) male patients and 5% female patients. There were 53 (88.3%) patients who have injured by road traffic accident and 7 (11.7%) patients who have injured by history of fall. There were 25 patients who had open fractures and 35 (58.3%) had closed fracture. The mean operating time of the patients was 85.0 ± 34.25 Minutes.

In follow up, 52 (86.7%) patients were complaining of pain at two weeks, 35 (58.7%) after one month and none after six months. After two weeks, 50 (83.3%) patients range of motion is up to 70° which gradually improved after two to six month of follow up. Knee stiffness of up to 70° degree was achieved in 52 (86.7%) patients, which improved. At follow up of 6 months knee stiffness at 90° was found in 17 (28.3%) patients at 110° was found in 15 (25%) patients 120° knee stiffness was found in 22 (36.7%) patients.

Radiological union was present in 29 (48.3%) patients after one month and at follow up of three and six month the radiological union was present in all 60 patient at follow up of two weeks full weight bearing was not achieved, 26 (43.3%) patients achieved full weight bearing at 6 months’ time, after this period 53 patients (88.3%) achieved full weight bearing on injured leg. Pin track infection was found in 17 patients (28.3%) in first month, which slightly increased in 3 months (35%) but at 6 month follow up pin track infection was not found in any patients.

**DISCUSSION:**

Different method for the management of tibial plateau fracture are POP cast, skeleton fraction
for 3 weeks followed by pin plaster, pin fixation and POP cast, screw fixation (with or without bone graft, bone cement), single or double buttress plates, percutaneous fixation. Conservative treatment can cause joint stiffness, muscle wasting, inadequate reduction and deformity. While operative treatment can cause soft tissues stripping, infection, non-union and intra articular fibrosis (Catagni MA, Ottaviani G, et all).5

None of the above mentioned techniques afford the surgeon’s ability to correct deformities, eliminate prolonged pre and post-operative antibiotic therapy, and regenerate new bone tissue. External fixations have been used to reduce soft tissue damage. Circular fixations has the ability to allow early mobilization and weight bearing making this method strikingly distinguished as compared to others and with good results (Shresta BK, Bijukachhe B, et all).7

Ilizarov method combined with minimal internal fixation enables excellent good results in most cases. The results were evaluated as excellent in 51% patients, good and 46%, poor in only 1.7%. The patient satisfaction was significantly related with the function results (Shresta BK, Bijukachhe B et all). Results had been improved by more frequent open reduction, bone grafting and internal fixation of fractures with severely depressed articular fragments. However the use of circular external fixation obtained results comparable with other series, and it is believed that it is appropriate for treatment of these complex tibial fractures, especially those with a poor soft tissue envelope. Fine wire fixation with limited internal fixation is a satisfactory method of managing complex high energy fracture of tibial plateau where soft tissue injury and bony communication make traditional techniques of open reduction and internal fixation unsuitable (Cole PA, Zolwedzki M et all)10

CONCLUSION:

On the basis of our result, we concluded that Ilizarov fixation is a good technique which gives good pain relief, early mobility, early radiological union and minimal knee stiffness. It also gives good results in cases where primary internal fixation cannot be done. It can be used even in presence of edema.

- Pin track infection is common but can be controlled with minimal intervention.
- Few cases of non-union and require secondary procedure such as bone grafting.
- Early weight bearing is a major advantage.
- Care of pins and daily cleansing considerably reduces the incidence of pin track infection.

Success of the treatment lies in educating the patient for regular consultation.

REFERENCES:

Outcome of Steroid Injections in Patients with De Quervian Disease

Muhammad Khalid Khan FCPS1 Muhammad Shoaib FCPS2

ABSTRACT
Background: Different outcome of different modalities including corticosteroid injections are reported in De Quervian tenosynovitis treatment.
Objective: To know the outcome of corticosteroid injection in De Quervian disease patients.
Materials and Methods: We performed the above study at Department of Orthopedics and Trauma Unit, Khyber Teaching Hospital, Peshawar from March 2015 to March 2016. We studied 26 patients with De Quervian disease. The effect of steroid injection was considered as improvement for at least one grade of pain on Visual Analogue Scale at 3 weeks follow up. The result was calculated by using SPSS version 10.
Results: The study contained 9 (34.6%) males and 17 (65.4%) females. Gender ratio as M:F was 1:1.73. Average age was 44.11 years ± 9.76SD with range in 18-58 years. Effectiveness of steroid injection was in 25 (96.2%) patients, and no improvement in 1 (3.84%).
Conclusion: The result shows that steroid injection has very good results in patients of De Quervian disease.
Key words: De Quervian Disease, Steroid injection.

INTRODUCTION
The first physician who described this condition is considered to be Fritz De Quervain. This disease causes wrist discomfort and may be so severe that can lead to dysfunction of the hand. The restricted and forceful gliding of the 1st dorsal compartment tendons, the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) is usually the pathology. The restricted movement of tendons is due to inflammation and thickening of the dorsal retinaculum at the first extensor compartment causing narrowing of the tendons tunnel.

De Quervian Disease is a common cause of wrist pain affecting around 1.3% of females and 0.5% of males in a population of adults of working age. Multiple factors are considered to cause this disease. These are activities involving repetition such as cooking, knitting or typing, variations in anatomy, influences of hormone as in pregnancy, Disease like rheumatoid arthritis and Fluoro-quinolone like drugs.

The “tenosynovitis” indicates an inflammation but the pathophysiological study of De Quervian Tenosynovitis shows no inflammation. The histological study of De Quervian Tenosynovitis shows findings of metaplasia of fibrocartilagenous origin, mucopolysaccharide deposition and new vessel formations. Nerve fibers, having sensory and sympathetic components, also grow inward with new vascularization, capable of eliciting pain.

Decreased hand (DASH) scores, shoulder and arm disabilities and dysfunction of the wrist is noted in patients with De Quervian disease. Diagnosis of De Quervian disease is easy with complete history and good clinical examination. There is pain and tenderness in all typical cases at the radial styloid and in some cases local swelling may be found. Classical cases show positive Finkelstein’s test.

There is no consensus about a single modality of management of De Quervian tenosynovitis. Different conservative management as rest, splints, heat and cold application, diathermy and massage etc. are not usually effective. Injection of steroid and local anesthetic into the first dorsal compartment, activity modification and analgesics are used in treatment of De Quervian Disease. In this study we studied effectiveness of steroid to gain some idea about the usual use of steroid in Patients of De Quervian disease.

Injecting local corticosteroids in the 1st extensor compartment leads to early improvement in De Quervian’s tenosynovitis symptoms.

MATERIAL AND METHODS
We performed the study at Department
Outcome of Steroid Injections in Patients with De Quervian Disease

of Orthopedics and Trauma Unit, Khyber Teaching Hospital, Peshawar from March 2015 to March 2016 after permission from the hospital ethical committee. We studied 26 Patients and the effectiveness was considered as improvement for at least one grade of pain on Visual Analogue Scale at 3 weeks.

Inclusion criteria: Patients of De Quervian disease with moderate to severe pain from 18 to 70 years’ age. Exclusion criteria: History of steroid injection taken previously, rheumatoid arthritis, osteoarthritis of the hand, gout or a fracture of the wrist, pregnant women and patients under 18 years of age. Informed consent was taken from all patients and were explained about the nature of the disease and treatment strategy.

The diagnosis of De Quervian tendinopathy was made based on wrist pain at radial-side, tenderness over first dorsal compartment and radial styloid, first extensor compartment swelling, pain on eliciting Finkelstein test, and negative findings for the differential diagnosis of radial sided wrist pain like carpometacarpal arthritis. Wrist x-rays were done to exclude patients with carpometacarpal arthritis. Visual analogue scale (VAS) was used to evaluate pain during daily activity.

Visual Analogue Scale (VAS): Grade 0: No pain, Grade 1: Mild = 1–3, Grade 2: Moderate = 4–7, Grade 3: Severe = 8–10

Injection Technique: Depomedrol 40mg and 2% lignocaine about 1 ml was taken. The most tender site was confirmed in 1st extensor compartment of the wrist. Aseptic preparation of the site was done. The needle was inserted in the first extensor compartment in radial styloid direction proximally and parallel to the abductor polices longus and extensor polices brevis tendons. Swelling of the synovial sheath due to injection was noted. Patients were injected steroid as above after their pain evaluation. One session of steroid injection was given only.

SPSS software version 10 was used to analyze data. Sex, age in years and age grouping were demographic variables while grade of pain before injection and grade of pain after injection were research variables. Qualitative variable were analyzed as number (frequency) and percentages (relative frequencies) and quantitative variables were analyzed as mean and SD.

The results were presented as tables.

Table 1: Sex wise distribution

<table>
<thead>
<tr>
<th>GENDER</th>
<th>MALES</th>
<th>FEMALES</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 (38.5%)</td>
<td>17 (65.4%)</td>
<td>26 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Age wise Distribution

<table>
<thead>
<tr>
<th>AGE IN YRS</th>
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</tr>
</thead>
<tbody>
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<td>18-30</td>
<td>4 (15.4%)</td>
</tr>
<tr>
<td>31-45</td>
<td>10 (38.5%)</td>
</tr>
<tr>
<td>&gt; 45</td>
<td>12 (46.2%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26 (100.0%)</td>
</tr>
</tbody>
</table>

Table 3: Pain after 3 weeks

<table>
<thead>
<tr>
<th>PAIN AT 3RD WEEK</th>
<th>No of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD</td>
<td>25 (96.2%)</td>
</tr>
<tr>
<td>MODERAT</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>SEVER</td>
<td>0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26 (100.0%)</td>
</tr>
</tbody>
</table>

DISCUSSION

De Quervian disease is one of the painful conditions of wrist and hand. This condition affects both male and females of working adults’ age. The condition is considered to be inflammatory in nature leading to impaired gliding of the extensor tendons. Multiple factors are considered to cause this disease. These are activities involving repetition, such as cooking, knitting or typing, variations in anatomy, influences of hormone as in pregnancy, rheumatoid arthritis and fluoroquinolone like drugs, but none is exactly known to be the cause. Female predominance was observed in our study. Gender distribution was 1:1.73 as male to female.

In one of the local study by Akram M et al they have shown 70% females in their study while 86.3% female were reported by Mehdinasab SA, Ale Mohammad SA.

We have observed better result of 92% in patients with steroid injection comparable to other studies at 3 weeks. In a local study by Akram M et al they have reported 80% result of steroid injection at 4 weeks. In another local study by Gulzar Saeed Ahmed, Imtiaz Ahmed Tago, Asadullah Makhdoom have reported all the 50 patients in their study symptoms free at six weeks.

The follow up duration was 24 weeks and no recurrence was observed. Richie and Eriner showed that local steroid injection alone is effective in 83% of patients. They observed after follow up for 9.6 months.
Outcome of Steroid Injections in Patients with De Quervian Disease

of 327 wrists injected, there were no tendon rupture or any other complication. 100% success rate was reported by Avci S et al. 94% patients satisfaction is shown by Sawaizumi T, Nanno M, Ito H, in their study.

Triamcinolone was injected locally for patients with De Quervain’s disease in their study. They claimed 90% of patients’ satisfaction. The anti-inflammatory effects of steroid is shown to persist for two to four weeks. Short term follows up and small sample size make our study limited. We concluded that a further study will be needed for longer follow up and large sample size.

CONCLUSION

We conclude that injecting local corticosteroids in the 1st extensor compartment leads to early improvement in de Quervain’s tenosynovitis symptoms

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Results of Intertrochanteric Hip Fracture Fixation with Dynamic Hip Screw

Muhammad Khalid Khan FCPS (Ortho) Muhammad Shoaib FCPS

ABSTRACT

Objective: The objective of the study was to know the result of intertrochanteric hip fracture fixed with dynamic hip screw in terms of time of union and rate of infection.

Material & Methods: This study was conducted in orthopedic Department of Khyber Teaching Hospital Peshawar on 75 patients with intertrochanteric hip fractures. After fixation with dynamic hip screw, patients were followed for wound infection at two weeks postoperatively and union at 16 weeks.

Results: There were 57(76%) males and 18(24%) females with the mean age of 40.50 years ± 14.89 SD. Sixty nine 69(92.00%) patients had no wound infection 06(8.00%) patients had wound infection at two weeks outpatient visit. Union of fracture at 16 weeks was noted in 72(96.00%) patients.

Conclusion: Dynamic hip screw is a good mode of internal fixation in Intertrochanteric hip fractures in terms of low infection rate and good union rate.

Key words: Intertrochanteric femur fracture, dynamic hip screw.

INTRODUCTION

Intertrochanteric fractures are relatively common injuries in adults and elderly individuals. In young individuals intertrochanteric fractures are result of high energy trauma while minimal trauma is required for elderly. 1

The incidence of proximal femoral fractures is on rise and expected to increase from 1.7 million in 1990 to 6.3 million in 2050. 2 The effect of these fractures is frequently devastating, the social impact is high and the relative costs of treatment are increasing. For these reasons methods of osteosynthesis that will permit early mobilization and a rapid return to pre-injury levels of independence are sought by surgeons. 3

The standard of care of these fractures is surgical fixation, close reduction and internal fixation which increases patient comfort, facilitate nursing care and decrease hospital stay. 4 5 Sliding hip screw with slide plate is commonly used implant for fixation for these fractures. The Plate of 135 degree is most commonly utilized. This angle is easier to insert in the desired central position of the femoral head and neck than higher angle devices and create less stress riser in subtrochanteric region. 6 Sliding hip screw works on basis of tension band in stable fracture (Evans 1&2) patterns transmitting forces through medial cortex, and allows for fracture collapse thus minimizing the chances of medial penetration. 7

Sliding compression with dynamic hip screw is the implant of choice for the treatment of intertrochanteric fractures with good functional out comes. This important modality of proximal femur fracture stabilization should popularize in the local setup.

Sliding hip screw is the implant of choice for most intertrochanteric hip fractures, 8 because DHS is simple to place, guides the proximal fragment into stable position, shearing forces being transferred to the axis of the sliding hip screw and produces the compression. Additional compression is achieved with compression screw. Dynamic compression achieved when patient start weight bearing. DHS allows early rehabilitation of patient, and less chances of infection, non-union and rotational deformities. 9 Despite these theoretical and biomechanical advantages, sliding hip screw constructs have limitations and excessive collapse results in failure. Sliding of more than 15mm leads to a higher prevalence of fixation failure. Medialization of the femoral shaft by greater than one third of the diameter of the femur is associated with a seven fold increase in fixation failure. Cutout of implant may occur in severe osteoporotic bone and wrong implant

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placement. Failure rate of DHS is about 5%.\textsuperscript{9} Insufficient or excessive sliding length available between the screw and barrel, jamming of screw in the low angle barrel plate. (120 or 125 angle). Majority of failure due to poor positioning of screw. TAD > 25 and screw not in the center of head. Lateral wall fracture. Fracture of lateral wall during surgery. D.H.S gives poor results in reverse oblique fracture. \textsuperscript{9}

MATERIAL AND METHODS

This was a descriptive case series study of patients with proximal fracture femur treated by dynamic hip screw. Thirty patients were included in this study, after sampling technique of non-probability convenience.

Inclusion Criteria: i) Proximal femur fractures, diagnosed on history clinical examination and radiological examination by taking X-rays AP and Lateral View. ii) Anatomically mature patients (the patients whose epiphysis has been united iii) Intertrochanteric fractures of less than one week

Exclusion Criteria: i) Patients who showed pre op. signs and symptoms of infection at the site to be operated or elsewhere in the body. ii) Patients with non united or mal-united femur fractures. iii) Patients with pathologic fractures i.e. secondary to bone tumors, metabolic bone diseases, tuberculosis etc. iv) Patients with other problems such as stroke, Parkinson disease, CRF, immune-suppression etc which affect fracture healing or rehabilitation. v) Patients operated on opposite side and poly trauma patient.

Patients were admitted from accident and emergency OPD department once they had met the inclusion criteria. Detailed history with known co-morbid, detailed examination and investigations including x-rays were done at the time of admission.

Base line investigations and chest X-rays, ECG, X-ray pelvis AP view and X-ray of involved hip joint AP and lateral view for all patients were done. Informed, written consent was taken pre operatively. Prophylactic I/V antibiotic was given, which was switched to oral after change of dressing after 48 hours of operation. Oral antibiotics were given for 5 days. Patient under spinal or general anesthesia, lying supine on traction table, reduce the fracture and confirm before applying drapes. Through lateral approach bone exposed, guide pin inserted 2cm below the vastus lateralis ridge. We used both technique for insertion of the guide pin i.e with Aiming Device and Freehand insertion. Guide pin directed to tip of head, either in center or in postero medial part. Power combination reamer was set to the lag screw length indicated by the measuring gauge and reamed until the distal aspect of the positive stop reaches the lateral cortex. Lag Screw placed, the side plate was advanced onto the lag screw shaft and fully seated and secured with bone clamp and fixed with 4.5mm cortical screw.

Post operatively patients were mobilized on bed in evening of operative day, allowed to sit on side of bed at 1\textsuperscript{st} post operative day. Patients were discharged on 3rd post operative day. Mobilization with the help of crutches or walker, non weight bearing, along with range of motion exercises and abductor and quadriceps strengthening exercises were allowed at 1\textsuperscript{st} week. Partial weight bearing was allowed after 6 week and full weight bearing after clinical and radiological evidence of union. OPD follow-ups were carried out at 2 weeks for removal of sutures and assessment of infection and at 16th week for assessment of union. Union was clinically and radiologically defined as no tenderness at fracture site, No pain on weight bearing and obliteration of the fracture lines on x rays.

Exclusion criteria was followed strictly to control confounding variables and bias in the study results. All the collected data was entered and analyzed on SPSS 10. Descriptive statistics were calculated for all the variables. Mean and standard deviation was calculated for quantitative variables like sex and union of fracture.

RESULTS

There were 57(76.00\%) males and 18(24.00\%) female shown in pie diagram, with the mean age of 40.50years ± 14.89SD. Youngest patient was 19 years old while oldest one was 50 years of age. A total of 75 patients with proximal femur fracture diagnosed on clinical and radiological examination by taking X-ray AP and lateral view, were include in this study.

According to the modified Evan’s classification for intertrochanteric fracture. i) Type I-c was the most common fracture that was found in 45(60.00\%) patients ii) type I-a fracture in 15(20.00\%) type I-b in 09(12.00\%) and iii) type I-d fracture in 06(8.00\%). Outcome of the patients was based upon post operative wound infection at two weeks postoperatively and union at 16weeks. 69(92.00\%) patients had no wound infection while 06(8.00\%) patients had wound infection at two weeks post operatively . Table No. 1 Union of fracture at 16 weeks; 72(96.00\%) fractures healed in 16 weeks while 03 (4\%) patients showed non-union. Table No. 2 Figure 1 Red females and blue males.
Wound infection At Two Weeks

<table>
<thead>
<tr>
<th></th>
<th>NO OF CASES</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Wound infection</td>
<td>69</td>
<td>92%</td>
</tr>
<tr>
<td>Wound infection</td>
<td>06</td>
<td>08%</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table No. 4 Union of Fracture after 16 weeks

<table>
<thead>
<tr>
<th></th>
<th>NO OF CASES</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union in 16 weeks</td>
<td>72</td>
<td>96.00%</td>
</tr>
<tr>
<td>No or delayed union in 16 weeks</td>
<td>03</td>
<td>04.00%</td>
</tr>
</tbody>
</table>

DISCUSSION

The treatment of proximal femoral fractures using fixed angled implants was succeeded by sliding screw devices which produced an improvement in union rates and fewer fixation and implant failures. As the natural history suggest these fractures are known to occur in elderly patients.10 The youngest patient in our study was 19 years old and the oldest was 90 years old, an average age of patients was found around 70yrs.11,12,13 Study conducted in Quetta by Saleh Tareen showed (according to the modified Evan’s classification) Type I-reducible unstable(1c) was found in 5(12.5%) patients, 15(37.5%) were type I-non-displaced fracture(1a), 18(40%) were type I reducible stable(1b).12 In our study Type I-c was the most common fracture that was found in 45(60.00%) patients, type I-a fracture in 15(20.00%), type I-b in 09(12.00%) and type I-d fracture in 06(8.00%)

In our study radiological evidence of union was present in 72 (96%) cases in 16th weeks while 3 (4%) case was non union at 16th weeks. Study conducted in India out of 110 cases, 72 patients had sound bony union 32 patients had satisfactory results with few degree of terminal restriction of hip joint movements.16 Study by Ahmad Fawad reported the rate of non-union (0%). Study conducted in Islamabad by Imran reported union in 97% cases.11

Korean study reported that unstable intertrochanteric fractures with osteoporosis had a failure rate of more than 50%.17 Mariani and Rand reported that 10 of 20 patients with non-union of intertrochanteric fractures have unstable fractures with loss of medial support.18 Study conducted in Switzerland reported that all fractures had healed six months after the operation.19 Internationally Nonunion following surgical treatment of intertrochanteric fracture occurs in less than 2% of patients.20 In our study out of 75 patients, wounds of 69(92.3%) patients were clean and 6(8%) patients had superficial infection at 2nd week. Deep infection was not found in any patients.

Study conducted in Islamabad showed superficial wound infection in 1.7% cases. Study by Saleh Tareen showed superficial wound infection in 2.5% cases. Studies conducted in JPMC Karachi reported infection rate in clean orthopeadics surgery was 5% and 3.97%. Study conducted in Bahawalpur reported infection rate 7.8%. Study conducted in India showed wound infection (1.8%) cases.14,15 Our infection rate was much higher than the developed countries. This high rate of infection should be reduced by eliminating factors responsible for infection for which further research needed.

CONCLUSION

We concluded that sliding compression hip screw is the implant of choice for the treatment of intertrochanteric fractures with good functional out comes. Further research needed both by supervisors and trainees to popularize this important modality of proximal femur fracture stabilization in our setup.

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Results of Intertrochanteric Hip Fracture Fixation with Dynamic Hip Screw


Outcome of Pars Plana Vitrectomy performed for Complex Rhegmatogenous Retinal Detachment

M. Tariq Khan FCPS(Ophth), FCPS (V-R)1, Imran Ahmad, FCPS, 2.Mubashir Rehman, FCPS3, Irfan Aslam Khattak  FCPS.4

ABSTRACT:
Objective: To analyze the outcome of Pars Plana Vitrectomy (PPV) in treating eyes with complex Rhegmatogenous Retinal Detachment (RRD) in patients presenting at Ophthalmology Department Hayatabad Medical Complex Peshawar.
Study design: a retrospective study.
Place and duration of study: Department of Ophthalmology, Hayatabad Medical Complex, Peshawar from 1st April 2016 to 31st December 2016.
Patients and methods Pars Plana Vitrectomy (PPV) was performed with a standard 3-ports method with indications of Proliferative Vitreo-Retinopathy (PVR) grade B and C breaks posterior to equator and breaks greater than 90 degrees (i.e. giant retinal tears). Silicone Oil or C3F8 gas was used as internal tamponade. Post-operative variables were the initial and final anatomical success, final BCVA after follow-up period, complications and subsequent surgical interventions for surgical failures/ re-detachments.
Results: A total of 194 eyes of 152 patients were included in the study. The mean visual acuity improved from 2.4 ± 0.70 to 1.3 ± 0.60 log MAR post-operatively. The failure and re-detachment rates after the first surgery were 7.22% and 10.82% respectively. In 192 out of 194 eyes (93.81%), the retina was ultimately re-attached. The mean follow-up period was 7 months (range: 3-11 months).
Conclusion: In complex retinal detachment cases (like those associated with high grade Proliferative Vitreo-Retinopathy), Pars Plana Vitrectomy is an effective surgical procedure to re-attach the detached retina.
Key words: Complex Rhegmatogenous Retinal detachment, Pars Plana Vitrectomy, Proliferative Vitreoretinopathy.

INTRODUCTION:
Retinal detachment is an uncommon eye disease but a relatively more common vision threatening retinal condition, causing profound visual loss and blindness. Histologically this is the detachment of neuro-sensory layers of the retina from the underlying retinal pigment epithelium (RPE). There are three different types of the retinal detachment - the most common type is “rhegmatogenous” which is characterized by retinal break(s). Rhegmatogenous retinal detachment (RRD) is an Ophthalmic emergency threatening vision with a prevalence of 1 in 10,000 people per year and can result in blindness, if untreated1.
Different surgical procedures are available to treat Rhegmatogenous retinal detachment like scleral buckling, pars plana vitrectomy and pneumatic retinopexy. All these procedures have a common principle i.e. to identify all retinal breaks, treat them and to relieve vitreous traction if present.2,3 Scleral buckling is considered as an appropriate and effective treatment for many simple uncomplicated primary cases of RRD. However in complicated cases of RRD like those with proliferative vitre-retinopathy (PVR), more posterior breaks or breaks at the posterior pole, breaks with vitreous hemorrhage and giant retinal tears (GRTs), pars-plana vitrectomy (PPV) with an endo-tamponade (gas or silicone oil) is the procedure of choice.3,5 During PPV, due to better visualization of retinal periphery, identification of the retinal breaks becomes easier and hence their closure becomes more certain. Also with PPV, the drainage of sub-retinal fluid is more controlled and causing less chance of sub-retinal hemorrhage, iatrogenic breaks and/or retinal incarceration6. With vitrectomy complete retinal re-attachment can be achievable intra-operatively without any risk of vitreous hemorrhage and/or ocular motility disturbances and is comparatively less painful than scleral buckling. In this study we evaluated the results of PPV in a group of complicated RRD patients presenting at the department of ophthalmology, Hayatabad Medical Complex, Peshawar.

MATERIAL & METHODS:

1 Asst. Prof. of Vitreo-Retinal, Ophthalmology, Hayatabad Medical Complex, Peshawar. 2 Asstt. Prof. Ophthalmology, Gajju Khan Medical College/ Bacha Khan Medical Complex Swabi 3 Asstt. Prof., Ophthalmology, Qazi Hussain Ahmad Medical Complex, Nowshera4 Trainee Vitreo-retina, Ophthalmology/Hayatabad Medical Complex, Peshawar.
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In this study, we reviewed and analyzed the details of 194 eyes of 152 consecutive patients undergoing PPV for RRD. Surgeries were performed on patients with complex RRDs at the department of Ophthalmology Hayatabad Medical Complex Peshawar from 1st April 2016 to 31st December 2016.

All patients were followed for at least 3 months after surgery. Patients of RD (1) operated with only scleral buckling, (2) with penetrating trauma and those (3) with combined tractional-rhegmatogenous retinal detachment (TRRD) were excluded from the study.

The standard method of 3-ports PPV was being used. The vitrectomy techniques included complete vitrectomy, releasing vitreous traction around the breaks and the peripheral vitreous was shaved as much as possible. Fluid-air exchange was performed, sub-retinal fluid (SRF) was drained either through the original break or through the retinotomy performed for this purpose. Perfluorocarbon liquid (PFCL) was used in selected cases. Endolaser photocoagulation or cryo-retinopexy was performed around the break(s) to create chorio-retinal adhesions. Silicone Oil or C3F8 was used as internal tamponade. The patients were instructed to maintain a prone position for three days to one week following surgery in C3F8 group.

A Performa was made to include different pre-operative, operative and post-operative variables. The pre-operative variables were age, gender; best corrected visual acuity (BCVA), presence/absence of macular detachment, retinal breaks (number, location), lens status (phakic, aphakic or pseudophakic) and grading of PVR. Intra-operative options were the placement of encircling band plus tire (Table – 2). There was no significant difference with respect to failure rate between these groups. Silicone oil tamponade was used in 144 eyes (74.23%) and C3F8 tamponade in 50 eyes (25.77%). After the 1st PPV surgery, the “failure” (detachment within 1 week after the 1st operation) and “re-detachment” (detachment after 1 week of the first operation) occurred in 14 (7.21%) and 21 (10.82%) eyes respectively (table - 3). Final retinal re-attachment after second or third operation was achieved in 182 of 194 eyes (93.81%). Mean BCVA improved from 2.4 ± 0.70 to 1.3 ± 0.60 log MAR post-operatively. The difference was statistically significant.

After the 1st PPV operation, 17 eyes (11.81%) were found to have a surgical failure or re-detachment in silicone oil group, while in C3F8 group surgical failure or re-detachment was noted in 18 eyes (36.0%) (Table-4). The difference was statistically significant. Post-operative complications were increased intraocular pressure (23.71%) which responded well to topical pressure lowering drugs in almost all cases, PVR (22.16%), choroidal detachment (1.03%), vitreous hemorrhage (2.06%), post-operative cataract (7.22%), and post-op endophthalmitis (1.03%).

**TABLE NO. 1 Pre-operative PVR grades**

<table>
<thead>
<tr>
<th>Grade of PVR</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade B</td>
<td>34</td>
<td>17.53 %</td>
</tr>
<tr>
<td>Grade CP</td>
<td>97</td>
<td>50.00 %</td>
</tr>
<tr>
<td>Grade CA</td>
<td>63</td>
<td>32.47 %</td>
</tr>
</tbody>
</table>

**TABLE NO. 2 PPV procedures Performed**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No. of eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV + oil/gas</td>
<td>126</td>
<td>64.95 %</td>
</tr>
<tr>
<td>PPV + oil/gas + band</td>
<td>52</td>
<td>26.80 %</td>
</tr>
<tr>
<td>PPV + oil/gas + band + Tire</td>
<td>16</td>
<td>8.25 %</td>
</tr>
</tbody>
</table>

**TABLE NO. 3 Outcome of the 1st PPV operation**

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure</td>
<td>14</td>
<td>7.22 %</td>
</tr>
<tr>
<td>Re-detachment</td>
<td>21</td>
<td>10.82 %</td>
</tr>
<tr>
<td>Attached</td>
<td>159</td>
<td>81.96 %</td>
</tr>
</tbody>
</table>

**TABLE NO. 4 Tamponade used & their outcome after 1st PPV operation**

<table>
<thead>
<tr>
<th>Tamponade</th>
<th>Frequency</th>
<th>%age</th>
<th>Failure/re-detachment frequency</th>
<th>Failure/ re-detachment percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone oil</td>
<td>144</td>
<td>74.23 %</td>
<td>17</td>
<td>11.81%</td>
</tr>
<tr>
<td>C3F8</td>
<td>50</td>
<td>25.77 %</td>
<td>18</td>
<td>36.00 %</td>
</tr>
</tbody>
</table>


DISCUSSION:

In this retrospective study, single procedure re-attachment success rate was 81.96%. Following the second and third operation, our final re-attachment rate was approximately 93.81%. Kinori et al achieved single-surgery anatomic success rate of 81.3% and 87.1% in the PPV and PPV plus scleral buckle groups respectively. Their ultimate final anatomic success rate was 98.9% and 98.8% respectively after a second or third operation. Tanner et al reported an overall 89% success rate of re-attachment with one procedure. One possible explanation for the slightly lower success rate could be attributed to the relatively late presentation of the patients in our community. Another possible explanation is that majority of the simple RRD cases are still being operated with scleral buckling alone which were being excluded from this study. In our study final re-attachment occurred slightly more frequent in the PVR grade B relative to PVR grade C, but this was not statistically significant.

In our study after the 1st PPV procedure, failure plus re-detachment rate with C$_F_3$ tamponade was higher than with silicone oil (36.0% vs. 11.81%) which is contradictory to the previous studies like the Silicone study which showed that Silicone oil and C$_F_3$ as tamponading agents were equally effective in the management of retinal detachments with PVR.

In our study, breaks were localized in 186 (95.88%) of 194 eyes. Amongst those with localized primary breaks, 110 (59.14%) eyes out of 186 were having breaks located in the inferior quadrants while 76 (40.86%) eyes had breaks localized in the superior quadrants. There was a statistically significant difference between failure and re-detachment rates with respect to break location so that the eyes with superior breaks had a better prognosis in comparison to the eyes with breaks in inferior quadrants. This finding is similar to the previous studies.

One of the most serious complications following RD surgery is post-op PVR, which has been reported in 8-24% of vitrectomy cases. In the present study post-op PVR developed in 43 (22.16%) eyes. The incidence of cataract formation and/or progression following Pars plana vitrectomy has been reported to be very high. This is the major side effect of vitrectomy; for this reason simultaneous cataract surgery can be performed specially in older patients. Furthermore combined phaco-vitrectomy surgeries in selected cases also facilitate intra-operative visualization and safe manipulation at the vitreous base and achieve not only a high re-attachment rate but also early visual recovery by virtue of simultaneous IOL implantation. In our study simultaneous lens extraction was performed in 48 (38.71%) of 124 phakic eyes and cataract formation and/or progression occurred in 41 of the remaining 76 phakic eyes (53.95%).

CONCLUSION:

1. Pars Plana Vitrectomy with an endo-tamponade (silicone oil/gas) is an efficient and effective treatment modality in terms of anatomical re-attachment of the retina. This procedure also considerably improves visual acuity in patients with complex RDs.

2. REFERENCES:

ABSTRACT
Objective: To study the demographic and clinical profile of patients with vernal kerato-conjunctivitis (VKC) presenting at Naseer Teaching Hospital.

Material and Methods: This was a hospital based descriptive case series study done at Department of Ophthalmology, Naseer Teaching Hospital from January 2014 to December 2014. Total 215 patients presenting with vernal keratoconjunctivitis at Eye Department, Naseer Teaching Hospital were included in the study in which consecutive (non-probability) sampling technique was used. A thorough history and ocular examination was performed in each patient gender distribution and clinical pattern of the disease was evaluated.

Results: Mean age at presentation was 11 years. Majority of the patients had palpebral variety (43%), followed by mixed (38%) and only limbal variety was seen in (17%) of patients. Chronic perennial disease was seen in 23% patients. Personal or family history of allergies was noted in 4% patients. Persistent disease beyond 20 years of age was found in 7% patients. VKC-related complications such as corneal scarring were seen in (5%), shield ulcer (3%), and keratoconus in (4%), respectively.

Conclusion: Vernal keratoconjunctivitis is a commonly occurring chronic condition and an important public health problem. Clinical pattern of VKC seen in the tropical climate of Peshawar is essentially similar to that seen in other tropical countries. Chronic perennial disease, with exacerbations in summer, low association with atopy, and higher propensity for disease and treatment related complications were important distinct features which were noted.

Key Words: Vernal keratoconjunctivitis, papillae, palpebral, limbal.

INTRODUCTION:
Vernal keratoconjunctivitis (VKC) is an allergic disease that typically affects young individuals with male preponderance.\(^1\) Greater prevalence of VKC is seen in the regions with hot, humid climate, and higher load of airborne allergens. VKC is more prevalent in hot and dry areas (Mediterranean basin, the Middle East, Africa and the Indian subcontinent). It is relatively unusual in most of North America and Western Europe. Risk factors include age, underlying atopic predisposition, extent of allergen exposure and individual immune response to antigenic stimulation. There is a significant history of other atopic manifestations such as eczema or asthma in patients with VKC.\(^2\) Family history of atopy is found in some of these patients.\(^3\) There is both type 1 hyper sensitivity and cell mediated role with predominantly, the cell type.\(^4\) It has been proposed that cytokines inhibit matrix metalloproteinases (MMPs) resulting in built up of conjunctival collegens.\(^5\)

Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal or bulbar conjunctiva affecting mainly children and adults. Males are affected more commonly than females and the palpebral variety is more prevalent than the bulbar or mixed one.

Vernal keratoconjunctivitis (VKC) is a severe form of ocular allergic conjunctivitis causing disturbance of normal activities at school or work due to severe itching, grittiness, foreign body sensation, difficulty in opening the eyelids, photophobia and copious mucous discharge.\(^6\) Clinically, it is characterized by presence of papillary hypertrophy of the palpebral and/or the limbal conjunctiva, bulbar conjunctival pigmentation, limbal thickening, Horner Trantas dots, and mucous discharge.
The main symptoms are itching, redness and foreign body sensation, lacrimation, photophobia, blepharospasm and pseudo-ptosis due to palpebral thickening are highly specific symptoms of VKC. White Trantas dots, superior punctate epithelial erosion and vernal shield ulcer with adherent mucous plaque are the signs seen frequently in patients with VKC. These symptoms if not treated appropriately can persist for weeks. Patients with VKC experience significant morbidity, which affects the quality of life.

PATIENTS AND METHODS

This is a hospital based case series study done at Naseer Teaching Hospital Peshawar, which is attached to Kabir Medical College, Peshawar. Duration of study was 1 year. Before the start of the study permission from the hospital ethical committee was obtained. Two hundred and fifteen patients (215) with VKC were the study group during that period. The patients were evaluated for inclusion and exclusion criteria as follows

Inclusion criteria: Bilateral symptomatic VKC with conjunctival papillae formation at the superior tarsus and/or limbus as the hallmark of the disease. The presence of persistent and recurrent symptoms of allergic conjunctivitis.

Exclusion criteria: All other types of conjunctivitis like viral, bacterial and allergic as well as traumatic conjunctivitis due to trauma with acid and alkali, were excluded because these conditions act as confounders and if included will introduce bias in study result.

A special data collection proforma was filled for each patient having a detailed record of the disease and personal history including family history and any history of atopy, duration of disease and, details of treatment (medical and surgical), and complications. Diagnosis of VKC was made on the basis of history, symptoms and typical signs observed during clinical examination and record of snellen visual acuity, measurement of intraocular pressure, fundus examination was done. Corneal topography was also carried out in few patients.

Active VKC was diagnosed based on the complaint of ocular itching in the presence of upper tarsal conjunctival papillae or limbal hypertrophy with bulbar conjunctival pigmentation. The quiescent form was diagnosed on the basis of inactive upper tarsal conjunctival papillae and/or scarring and a previous history of ocular itching including age of onset of the disease, presenting symptoms. The palpebral form included patients with characteristic signs of diffuse conjunctival palpebral oedema, thickening with papillary hypertrophy and cobble stone papillae of >1 mm on the upper tarsal conjunctiva with no limbal infiltration, while the limbal form consisted of gelatin like limbitis of <1 mm on the limbal conjunctiva with limbal infiltration of 180 degree or more, and mixed form had features of both palpebral and limbal types of VKC.

Data collected included best spectacle corrected visual acuity (BSCVA) in each eye using Snellen’s acuity chart. Slit lamp bio-microscopy for anterior segment examination with +78 dioptre condensing lens (Volk) for fundus examination and Perkins applanation tonometry was done in all cases. All the analysis was done in SPSS version 10. Frequencies and percentages were calculated for categorical variables like gender. Mean standard deviation was computed for numerical variables like age. All the results were presented as tables and graphs.

RESULTS:

A total of 215 patients of VKC were divided into 5 groups starting from 0 to 5 years, 6 to 10 years, 11 to 15, 16 to 20 and above 20 years. The mean age at presentation was 11 years. There were 81 (37.67%) patient in the age group of 6 to 10 years while 72 (32.18%) were in the age range of 11 to 15 years. Only 15 (6.9%) were above 20 years of age. Patients who had their first episode at or after 20 years of age were categorized as adult onset VKC. There were 162 (75.3%) males and 53 (24.6%) females. The male to female ratio was 3:1, which increased with age. The disease was active at initial presentation in 195 individuals. Fifteen patients (7%) were aged >20 years at the time of presentation.

Table 1 shows the age distribution of the patients with VKC. Gender distribution and clinical type is shown in Table 2.

Table 1. Age distribution of (n=215) vernal keratoconjunctivitis patients

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>14</td>
<td>05</td>
<td>19</td>
</tr>
<tr>
<td>06-10 years</td>
<td>60</td>
<td>21</td>
<td>81</td>
</tr>
<tr>
<td>11-15 years</td>
<td>55</td>
<td>17</td>
<td>72</td>
</tr>
<tr>
<td>16-20 years</td>
<td>23</td>
<td>05</td>
<td>28</td>
</tr>
<tr>
<td>&gt;20 years</td>
<td>10</td>
<td>05</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>162(75.3%)</td>
<td>53 (24.6%)</td>
<td>215</td>
</tr>
</tbody>
</table>

All of cases had bilateral disease. The common reported symptoms were itching (88%), redness (86%), watering (65%) and photophobia (52%).
The commonest signs were palpebral/tarsal papillae in (43%) and limbal thickening in (17%) of patients.

**Table 2. Clinical Pattern of (n=215) vernal keratoconjunctivitis patients**

<table>
<thead>
<tr>
<th>Patients</th>
<th>Total</th>
<th>Palpebral (%)</th>
<th>Mixed (%)</th>
<th>Limbal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>163</td>
<td>64</td>
<td>73</td>
<td>26</td>
</tr>
<tr>
<td>Female</td>
<td>52</td>
<td>30</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>215</td>
<td>94 (43.7%)</td>
<td>82 (38%)</td>
<td>39 (18%)</td>
</tr>
</tbody>
</table>

The commonest complication was corneal scarring, which was present in 11 patients (5%). Keratoconus was seen in 4%, whereas corneal shield ulcers were seen in 3% of patients. However we did not observe any case of increased intraocular pressure resulting in steroid induced glaucoma.

**DISCUSSION:**

Vernal keratoconjunctivitis (VKC) is an allergic disease that typically affects young individuals with male preponderance. Allergic eye diseases including vernal keratoconjunctivitis (VKC) are common diseases in Southeast Asia. In Africa, VKC was identified as the most common conjunctival disease in children seen in hospital. Study done by Farouk et al in Kuwait University Hospital showed that allergic eye diseases are the second most common diagnosis in the eye clinics after refractive errors. Majority of cases with VKC examined in this study were between 05-15 years. (71%) while still the disease persists to the adult age in a number of patients after the age of 20 years (7%).

Our study showed that VKC in the city of Peshawar, KPK is essentially similar to the pattern described in other tropical countries. The pattern here is predominantly palpebral form of disease (43%) with significant number of patients having chronic perennial form (23%). Slightly higher propensity for VKC and its treatment associated complications were seen. Persistent disease beyond 20 years of age was seen in increased number of patients (7%).

The mean age of presentation was 12 years. VKC is believed to be a disease of childhood and usually resolves at puberty; interestingly, we found that almost 7% of patients in our series were above 20 years of age. Leonardi et al., found 4% of patients above the age of 20 years. and Shafiq et al., reported 6% of patients with VKC above the age of 20 years in a hospital-based study in Pakistan. Certainly extreme hot and dry tropical environmental condition may be responsible for this duration of disease.

The study included 162 males and 53 females with M: F ratio of 3:1. Leonardi and co-workers in two separate observations including a multicenter study from Italy found M: F ratio between 3.3 and 3.5. By and large, all other series have reported M: F ratio between 4:1 and 2:1. Ukponmwan reported a female preponderance (M:F ratio of 1:1.3) from Nigeria. However, another report from that region suggested M:F ratio of 1.27:1. M:F ratio in our study is almost comparable than those reported from other parts of the world, and confirms the global pattern of male preponderance of VKC.

The highest incidence of patients was seen in the month of June, which corresponds to the hot dry weather in our part of the world. VKC has seasonal exacerbations; however, chronic perennial form has been described and 23% of patients in our series had chronic perennial disease. Tuft et al noted differences between the clinical features of VKC in tropical and temperate countries and showed that VKC in tropical countries exhibits larger population with chronic perennial disease and lesser association with atopy. In concordance to this, we noted that 23% of our patients exhibited chronic perennial disease and positive personal or family history of allergies was present in only 6% of patients; however, this is in contrast to the picture seen in the temperate zones as reported by Lambiase et al., and Bonini et al., who found associated systemic allergies in almost 44.5% patients in different series.

The prevalence of subtypes of VKC is different in various parts of the world. The multi centric study from Italy reported predominance (53.8%) of limbal presentation, whereas Ukponmwan reported 82.6% cases with palpebral presentation in Nigeria. In our study, we observed that the palpebral type of the disease was commonest (43%) followed by the mixed type (38%) which was commoner than the limbal (18%), however in contrast to another study of 530 cases of VKC in northwest frontier province of Pakistan, the mixed type afflicted 93.6% of their cases.

VKC can cause various corneal complications leading to decreased vision. Bonini et al., noted permanent visual loss in 6% of patients due to corneal complications and scarring. Corneal scars were noted in 5% of patients, Corneal shield ulcers were present in 3% of patients; however,
slightly greater incidence of corneal shield ulcers were reported by Bonini et al (9.7%) and Leonardi et al (15.3%) as compared to our series. Visual loss resulting from glaucoma due to injudicious use of topically administered steroids has been reported by many workers but in our case series we did not encountered any case of increased IOP resulting in visual loss which was very unusual.

Keratoconus is another corneal complication associated with VKC, and we noted that 4% of our patients had keratoconus diagnosed clinically and with corneal topography. Other series have reported a very low incidence of this complication from 0.5 to 2.1%. Peripheral corneal neovascularization is a known finding in VKC and has been reported by other series, although the magnitude is not reported.

In summary, this study has shown that VKC in Peshawar is essentially similar to the typical pattern of VKC seen in other tropical countries. Perennial pattern in large number of patients, persistent disease beyond the age of 20 years are certain findings seen in our study that one should consider during management of these cases.

CONCLUSION:

Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and/or bulbar conjunctiva affecting mainly children and adults. Males are affected more commonly than females. The palpebral variety was more prevalent than the bulbar and mixed alone.

REFERENCES
Achenbach's Syndrome
A healthy 66-year-old nonsmoking woman presented with recurrent pain and paroxysmal spontaneous subcutaneous bleeding in her middle finger, with no history of trauma or exposure to cold. She had normal complete blood count and coagulation studies. The diagnosis is Achenbach's syndrome which is characterized by the above symptoms. There are no confirmatory laboratory or imaging tests. Achenbach's syndrome is benign and self-limited disorder which resolves without specific treatment.

IRIS CYST
A 43 old male had corneo-scleral perforation a year ago. He had repair done with vision of 6/12 in that eye. Now he is having decrease vision with IOP of 31mmHg. Diagnosis of iris cyst was made followed by surgical excision.

Pyogenic granuloma
A 30-year-old man presented with this lesion over 3 days. Two weeks before a cyst had ruptured on the same eyelid. This is a benign vascular lesion characterized by inflammatory cells and lobular capillary proliferation. Conjunctival pyogenic granulomas grow rapidly following conjunctival injury from surgery. Differential diagnosis: Squamous papilloma, Amelanotic melanoma, Squamous-cell carcinoma, Pyogenic granuloma, Suture granuloma.

Purpura Fulminans
A young boy presented with fever, vomiting and purpuric lesions on the legs that spread to his face and abdomen. The lesions initially developed bullae with recessed centers then ulcerated, followed by the development of granulation tissue. He was found to have bacteremia with Neisseria meningitides and developed septic shock which clinically improved with appropriate treatment, with healing. The diagnosis is acute infectious Purpura Fulminans. The condition can be idiopathic or associated with hereditary protein C and S deficiencies. The D.D. are Vitamin C deficiency, Drug-induced vasculitis, Purpura fulminans, Henloch-Schonlein purpura, Idiopathic thrombocytopenic purpura.
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