Ophthalmology
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Published quarterly by Ophthalmic Newsnet from 267-A, St. 53, F-10/4, Islamabad
Phone: 051-2228922 Ext. 1255
Fax: 051-2299113
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E-mail: ophthalmologyupdate@gmail.com
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Website: www.ophthalmologyupdate.com
www.pnme.edu.com

Subscription: Rs. 800/- Yearly
International: US $ 100/- Yearly

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Registration: 3405/2/(63) under Press and Publication Ordinance '98, Govt. of Pakistan.

Circulation: Schazoo Pharmaceutical Lab. (Pvt) Ltd., Lahore by Mr. Omer Safdar, Business Unit Manager
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Results: These should be presented in a logical sequence in the text, tables and illustrations. Only important observations should be emphasized or summarized.

Discussion: The author’s comments on the result, supported with contemporary references, including arguments and analysis of identical work done by others. Brief acknowledgement may be made at the end.

Conclusion: Conclusion should be provided under separate heading and highlighting new aspects arising from the study. It should be in accordance with the study.

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Computer Related: Eye Strains, Headaches & other Health Problems

Over indulgence in TV and computers can produce visual, physical, and mental problems with moral hazards.

COMPUTER is a technological breakthrough in every field of life and it has attracted enormous amount of attention right from scientist to an elementary student. It has a tremendous growth popularity, influencing our society so much so that the exposure to computer has become indispensable for homes, teaching institutions and organizations in every field of life. It has firmly been established that the computer games are most likened mode of entertainment for children as well as the elderly people. In fact these computers (especially the laptops) have captured our lives and made us completely dependent on them. Laptops are, now a days, getting very popular due to a handy apparatus, small screen and inbuilt pointing devices i.e., keyboard, small portable mouse and a touch pad. These are being used as the main computers in the offices as an essential tool in place of normal desktop computers. With the increased and improper usage, a number of health and safety concerns related to the vision and body has arisen, especially a laptop needs more concentration and causes mental exhaustion, visual fatigue and at times headaches. which are preventable by simple corrective methods after greater awareness. However computer related problems never cause permanent damage, yet temporary discomfort can reduce productivity, loss of work-time and job satisfaction. Therefore, the use of laptop should be restricted and if necessary it is advisable to use as an additional tool.

With the changing life style, youngsters and children are crazy in spending more time in indoor activities and less in outdoor sports like activities. Parents have noticed that their children are playing computer games for a longer period and they hardly listen to them. Reaching home after schooling, children spend most of their time in front of TV or playing most popular computer games. They often complain of frequent headaches, watery eyes, back ache, emotional upsets and lack of concentration in their studies. Most of the complaints from computer usage are: Musculoskeletal problems are generalized stiffness of the body, discomfort, tingling sensation, body aches with burning sensation and skin rashes

Visual problems are fatigue, blurring, eye strain, lack of concentration, double vision, dry eyes and may be excessive watering in certain cases with frequent changes in glasses prescription especially in school children.

Computer Vision Syndrome’ (CVS): Focusing on a screen is not a straight forward process and is not as simple as we think. The distance between the front of the monitor and our eyes is called the ‘working distance’. Interestingly our eyes actually want to relax at a point that is farther away from the screen. We call that location ‘the resting point of accommodation (RPA), which certainly lies behind the monitor screen. In order to see things clearly, our brain constantly readjust its focus between RPA and monitor screen. The struggle leads to fatigue resulting in ‘eye strain’ which eventually triggers headache. Scientifically speaking we call it a ‘Computer Vision Syndrome’. Now CVS is very common all over the world. People who spend several hours a day on computers without a break often complain head ache, blurry vision, dry eyes, pain in the neck, shoulders, back of the chest, lumbosacral region due to bad posture and leaning for hours over the computers. It has been proved that CVS may lead to myopia, glaucoma like symptoms, obesity, early smoking in children, loss of appetite and even insomnia.

Doctors have observed increasing incidence of worldwide myopia with physical and emotional changes leading to moral turpitude especially in younger generation. There is an alarming rise of myopia to the
extent of an epidemic form especially in countries with advanced information technology. For example in Singapore and Israel, 30 years ago, the incidence of myopia in teenagers and school-going children was just 30-35% which has now jumped to 80%, as the state has laid more stress on the book reading. According to a study in Pakistan, most of the children who are book worms and are involved in memorizing process suffer from myopia. There could be other reasons like under nutrition, genetics, prolonged illness apart from increasing burden of studies right from the tender age of 8 to 12 years which is the most vulnerable period to suffer myopia. In a recent study in USA, the incidence of myopia in children of non-myopic patients is 6%, in a single myopic parent it is 18% and in both myopic parents it is 33%.

The question arises how myopia develops? What is its relation with computers and what happens anatomically. According to one school of thought the explanation appears to be quite relevant, that during the developing age, children spend more time focusing on closer objects such as studying book, focusing on TV and computers for longer hours. The eye is thought to grow longer and longer as less effort is needed to see near objects clearly, but an elongated eye will no longer focus distant objects thus inducing myopia which explains the prominence of myopic eyes. On the contrary, the children who take more interest in physical activities or games are less susceptible to myopia as it tends to involve more focusing on distant objects rather near objects, thus protecting the eye ball from abnormal growth. The best example is the youngsters playing tennis are less likely to suffer from myopia.

Myopia is rising at a fastest rate in the far-eastern countries but the western world is equally worried about it. Recently a team of scientists have found a strange linkage of myopia to diet rich in sugar and refined starch including white bread, rice and cereals. They argue that such foods may affect the development of insulin and reduction of protein-3, which is thought to be responsible for the growth of the eye ball and lens. The evidence of North American-Canadian Eskimos where incidence of myopia is hardly 1-2%; the reason scientist believe that they eat fish, tuberous plants and coconut rather than bread, rice and cereals. However this needs further study.

It is also postulated that apart from myopia they get glaucoma like symptoms with field changes in the long run. Moreover, scientists with the help of magnetic resonance imaging (MRI) are able to document altered brain response after play of violent video games. These changes are exactly on the pattern of ‘Disruptive Behavior Disorders’ and those who play continuously a decreased activity of prefrontal cortex-areas controlling emotions and aggressive behavior has been noted. These changes are likely to become permanent at some point and if parents are concerned scientists advise to limit the period of playing violent games.

Some advances have also been demonstrated that playing video games may induce functional plasticity and spatial resolution which improves the irreversible Amblyopia in adults. Let us see when a child should start using a computer? Is it at the age of 3 years? The very fact cannot be ignored that the computer usage improves children’s performance in reading and writing but involvement at an early age may expose them to the development of myopia and many other health problems in the long run. It is important to understand that the child should start using computers when he has attained the school going age or sufficient perceptive ability to grasp or recognize letters and that mostly lies between the age of 4 and 5 years.

Computer as Best Friend. When we return home after spending long hours in the office we need to relax in the bed for a short time. Instead we find computer as our best friend and we spend few more hours in surfing the internet and playing computer games. Today it has become an interesting way of modern life to tax the already overtaxed mind and we never give rest to the brain cells to regain normality, hence the vicious circle of visual engagement continues uninterrupted.

Protect your children: A recent study has revealed that every four out of five youngsters hide internet activity that parents may think inappropriate. How you can save the children from such activities. It is worth checking with your broadband Internet Service Provider (ISP) about blocking the sites. The biggest ISP include BT, Virgin Media, Sky and Talk-Talk which have made it easier to launch parental control to block suspicious sites. This free software can be easily downloaded from the web as it provides remotely the control for Windows and PC Users, using a web filter. Moreover, one can install a software via AVG website which will protect wide range of devices including PC, Macs, iPhones, Pads and window phones even limiting specific times that children can log on, enabling parents to access from anywhere. One can remotely block websites, restrict phone numbers and set daily time limits and this is how you can protect your children.

Summary: There are some useful guidelines for parents, students, teachers and computer users to operate the computers as an opportunity to talk, listen and share experiences to make computer a real life objective. We must reduce the time spending on computers especially the children on computer games or watching TV to the extent of less than an hour a day and encouraging them to spend more time in out-door ac-
tivities. Other computer users must observe frequent short breaks and walk about to relax the body during their continuous hand-on-computers, this is absolutely important.

In by-gone days, people preferred health foods with energy drinks and not the junk foods with cokes and candies, refrigerated and micro-wave processed diet. They led a real healthy lifestyle. The parents must ensure that their children take balanced diet with energy drinks and have a good uninterrupted sleep which will improve their appetite, increase their perceptive ability with freshness to take more interest in their studies and day to day work. Finally, listen to your body when it tells you ‘enough is enough’. The ancient rule seems unchanged, if you want to be smart, eat wisely and exercise generously.

REFERENCES:


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The Management of Ophthalmology Update wishes its readers a Happy New Year
Contact Lens Induced Keratitis

Naveed Ahmad Shah FCPS¹, Abdul Ghafoor FCPS²
Iftikhar Ahmad FCPS³

ABSTRACT:
Objective: The purpose of this study was to evaluate the microbiological picture of keratitis associated with contact lens wearing.

Material and Method: The study comprised all consecutive patients presenting with contact lens related presumed microbial keratitis during a 12-month period at our department. Detailed demographic data, type of contact lens, duration of lens wear, wearing schedule and lens hygiene were derived from a self-administered questionnaire. Severity of ulcer, corneal scrapings, treatment and final outcome were evaluated.

Results: Gram-negative bacilli and Acanthamoeba were recovered from the corneal scrapes of all 35 patients (97%) were having gram negative bacteria. There was a significantly higher number of Pseudomonas aeruginosa (73.68%) and (3%) were having Acanthamoeba infection.

Conclusion: Disposable contact lenses seem to have been a predisposing factor for contact lens induced keratitis also when used on a daily wear schedule. Insufficient contact lens care products and/or manufacturing characteristics may be responsible for keratitis, which is also observed in otherwise compliant contact lens users. In 3 of our patients with keratitis, keratoplasty became necessary, indicating that contact lens induced keratitis may result in severe corneal complications.

Keywords: Contact lens-associated keratitis, incidence, contact lens, microbial contamination of contact lens-care product, P. aeruginosa

INTRODUCTION
Keratitis is a sight-threatening contact lens complication.¹⁻¹² Severe bacterial keratitis may result in perforation and endophthalmitis.¹⁰,¹³ Contact lens (CL) wear is the main risk factor,³,⁶,¹⁴,¹⁵ and sleeping with contact lenses is the major risk factor among contact lens wearers.⁴,⁹

A corneal ulcer is defined by a corneal infiltrate associated with an overlying epithelial defect.¹²,¹⁴,¹⁵ Corneal ulcers generally occur when the normal eye’s natural resistance to infection has been compromised from either trauma or contact lens wear.¹⁰ Bacterial infection accounts for approximately 90% of microbial keratitis.⁹ Microbial keratitis increased in prevalence following the introduction of soft lenses in the 1970s.³ The most common pathogens implicated are staphylococci and pseudomonas.⁵,⁶,¹¹,¹³,¹⁴,¹⁷,¹⁹

Acanthamoeba keratitis manifests as an extremely painful ring-shaped infiltrate possibly associated with either swimming while wearing contact lenses¹²,¹⁸ or generally poor contact lens disinfection (the use of either tap water or saline instead of multipurpose solution).¹³ The patient usually has severe pain disproportionate to clinical findings.¹² The condition develops over a period of several weeks.¹⁸

MATERIALS AND METHODS
To evaluate the microbiological profile of keratitis associated with contact lens (CL) wear, 35 patients were studied at Mardan Medical Complex from Jan 2011 to Jan 2012. Each patient was examined at the slit-lamp; clinical features were noted and drawing was made for patient’s records. A corneal scrape was performed using flame-sterilized Kimura spatula or Bard-Parker blade (#15) following instillation of 0.5% proparacaine hydrochloride. The material obtained was subjected to direct microscopic examinations (10% potassium hydroxide wet mount and Gram-stain) and culture (on 7% sheep blood agar, chocolate agar, S. aureus dextrose agar, non-nutrient agar, thioglycollate medium and brain heart infusion broth media). In addition to corneal scrapes, CL storage cases along with lenses and lens care solution bottles were collected at the time of presentation and were subjected to microbiological evaluation for determining the microbial contamination of lens care product.

Additional specimens were inoculated directly onto sheep blood agar, thioglycollate broth, S. aureus dextrose agar, and non-nutrient agar with an overlay of E. coli. Ten percent potassium hydroxide wet mount at 450 x magnification revealed polygonal double-walled cyst, and similar cysts were also noticed in Giemsa stain. On the fourth day following Acanthamoeba inoculation in non-nutrient agar. The inoculum from the contact lens and the container was sterile.

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Received: Nov’12 Accepted: Dec’2013
Detailed information on the type of CL, duration of wear, schedule and lens hygiene was derived from a self-administered questionnaire. “Extended wear” was defined as a 24-hour use at least once per week, less frequent overnight wear was defined as “daily wear”. In accordance with the clinical aspects (the site of the major part of the keratitis), patients were assigned to one of two categories, namely central keratitis, presenting in a central, approximately 6 mm diameter zone of the cornea, and peripheral keratitis, manifesting within 2 mm of the limbus.

Initially, therapy management comprised an empirical first line broad-spectrum antimicrobial treatment with topical moxifloxacin or ciprofloxacin. In case of severe anterior segment inflammation with hypopyon, an additional systemic broad-spectrum antimicrobial substance with vancomycin was administered. Additional microbiological tests (Acanthamoeba) was also performed if the disease was progressive and treatment considered a failure. With positive microbial culture findings, treatment was modified accordingly.

**RESULTS**

A total of 42 bacterial pathogens were recovered from 35 ulcerative cornea, of which 28 (73.68%) were *Pseudomonas aeruginosa* (28 were isolated as single species and the remaining two were mixed with Acanthamoeba). The culture of CL storage cases (total of 70 wells) and the lens care solution of 35 patients yielded positive bacterial growth in all 70 wells and six of the 35 bottles of lens care solution respectively. Bacterial pathogens recovered from CL storage cases were identical with the bacterial species recovered from the corneal scrapes of the respective infected eyes. Out of 35 patients with contact lens induced keratitis (CLIK) due to contact lens wear, 25 patients had a central ulcerative keratitis and 10 have peripheral one.

**DISCUSSION**

With growth of soft CL wear, the incidence of CL-associated microbial keratitis has increased up to 30% of all keratitis in developed countries, whereas in this present study, it was found to be 1%. This low incidence in the present study may be attributed to the limited number of people wearing CL in our region due to economic factor. The microbes responsible for CL-associated keratitis include gram-negative bacteria and rarely, gram-positive bacteria and fungi, whereas Acanthamoeba predominated in the developed countries. Several CL-related and non-CL-related factors were attributed to the higher incidence of Acanthamoeba keratitis among CL wearers in developed nations. In contrast, bacteria was found to be the major pathogen for all CL-associated keratitis in this study. *Pseudomonas aeruginosa* was reported to be the most common organism isolated from CL wearers in the developing world.

All CL storage cases and six lens care solution bottles were found to be contaminated with potential gram-negative bacilli in this study and the bacterial pathogens recovered from the corneal scrapes were identical with the bacterial pathogens isolated from the CL storage case wells of corresponding infected eyes. It

<table>
<thead>
<tr>
<th>Name of isolates</th>
<th>Name of corneal scraping with positive cultures(%)</th>
<th>Name of contact lens cassette wells with positive bacterial growth(%)</th>
<th>No of lens care solutions with positive bacterial growth(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>28(73.68)</td>
<td>54 (77.14)</td>
<td>6 (17.14)</td>
</tr>
<tr>
<td>Acanthamoeba</td>
<td>3 (7.89)</td>
<td>6 (8.57)</td>
<td>0</td>
</tr>
<tr>
<td>Klebsiella spp</td>
<td>1 (2.63)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Alcaligens spp</td>
<td>1(2.63)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Serratia sp</td>
<td>1 (2.63)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Both PA and Ac spp</td>
<td>2 (5.26)</td>
<td>2 (9.68)</td>
<td>0</td>
</tr>
<tr>
<td>Both PA and Alcaligens spp</td>
<td>0</td>
<td>2 (9.68)</td>
<td>0</td>
</tr>
<tr>
<td>Both PA and Serratia spp</td>
<td>0</td>
<td>2 (9.68)</td>
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<td>Both PA and Klebsiella spp</td>
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<tr>
<td>Both Ac and Klebsiella spp</td>
<td>2</td>
<td>2 (9.68)</td>
<td>0</td>
</tr>
</tbody>
</table>

PA. *Pseudomonas aeruginosa*, CL, contact lens, Ac, Acanthamoeba
can be assumed that the source of contamination was the CL storage cases. In developing countries like Pakistan, commonly used water is contaminated by gut commensals, especially *Pseudomonas*. Contact of CLs and CL storage cases with water can cause contamination by *Pseudomonas*, which survives well in the moist environment offered by CLs, CL storage cases and lens care solutions. Contaminated CLs which were used by the patients, acted as a vector for transmitting the microbes from the CL storage cases to the patients’ conjunctiva and cornea by forming polysaccharide-containing bio-film on the posterior surface of soft CLs by bacterial adherence. Bacterial adherence to artificial surface is also thought to be mediated by hydrophobic bonding and relatively hydrophobic strains adhere very readily to CLs. In addition, more acidic environment due to raised level of lactic acid and carbonic acid in the tear film could reduce the pH and increase bacterial adhesion. Although *Pseudomonas* adhere poorly to intact corneal epithelium, corneal surface damage due to trauma by poorly maintained CLs during the insertion and removal of CLs provide entry into the cornea leading to keratitis by *Pseudomonas*. The type of micro-organisms recovered from the corneal scrapes and CL-care products- *P. aeruginosa*, *Enterobacter* sp, *Klebsiella* sp, *Alcaligenes* sp. and *Serratia* sp, are not part of *Alcaligenes* sp, *Serratia* sp, *Klebsiella* sp, *Pseudomonas*. The type of microbial pathogens recovery from the corneal scrapes and CL-care products- *P. aeruginosa*, *Enterobacter* sp, *Klebsiella* sp, *Alcaligenes* sp, and *Serratia* sp, are not part of *Alcaligenes* sp, *Serratia* sp, *Klebsiella* sp. *Pseudomonas* spp were the dominant causative agents. Increased awareness of adequate lens care and disinfection practices, continuous supervision of all CL-wearers and frequent replacement of CL storage cases would greatly help to reduce this risk of infection on cornea.

**REFERENCES:**

INTRODUCTION
Accurate intraocular pressure (IOP) measurement is one of the most important steps in ophthalmic practice, especially in the diagnosis and assessment of the effectiveness of glaucoma treatments. The current gold standard to measure IOP is Goldmann applanation tonometry (GAT). However, it has been clearly documented that GAT measurements can be affected by several ocular factors such as corneal curvature, axial length (AL), and central corneal thickness (CCT). Recent studies focusing on ocular hypertension have reconfirmed the importance of CCT in IOP measurements. On the other hand, during the past decade, it has been proposed that CCT is just one of several corneal biomechanical properties that affect IOP measurement. Those biomechanical properties include corneal viscosity, elasticity, hydration, connective tissue composition, and regional pachymetry. In a recent study, it was shown that the level of corneal elasticity may influence the effect of CCT on IOP measurement.

Various structural and functional abnormalities of the cornea in patients with diabetes mellitus, called diabetic keratopathy, have been reported, including impaired epithelial and endothelial function, recurrent corneal erosions, punctate keratitis, and delayed wound healing. Non-enzymatic glycosylation (glycation) of proteins (Maillard reaction) results in the formation of advanced glycosylation end products (AGEs), and this process exhibits several harmful reactions including the liquefaction of the vitreous body leading to diabetic retinopathy and retinal detachment, the corneal rigidity, and retinal microvascular alterations. It has also been reported that glucose can act as a collagen cross-linking agent with the help of AGEs. Advanced Maillard products accumulate in collagen proteins, result in the formation of covalent cross-linking bonds, and may lead to increased corneal thickening and biomechanical changes. These changes may affect the measurement of IOP in an unexpected manner, such as an overestimation of the “true” IOP.

Measurement of central corneal thickness (CCT) is an important component of a complete ocular examination, particularly for patients being evaluated for the risk of developing primary open angle glaucoma. Diabetes mellitus is a very common disease world-
wide having a significant health impact on society. Studies have shown that diabetic patients have a significantly increased central corneal thickness compared with healthy controls. Diabetes mellitus affects biomechanical parameters of human corneas, including increased corneal hysteresis, corneal resistance factor and CCT. Diabetic patients are at increased risk of developing glaucoma. The implications of this in the clinical management and understanding of glaucoma is still not clear. Singapore Malay Eye Study has showed that diabetes and hyperglycaemia are associated with thicker central corneas, independent of age and IOP levels. To our best knowledge there are no studies in published literature on the role of blood glucose levels at different points of time and its correlation with CCT recorded simultaneously in our set up.

**MATERIALS AND METHODS**

This study was conducted in Ayub Teaching Hospital from July 2011 to Dec 2011. 93 cases of diabetes and 90 of non-diabetic subjects were randomly selected from the patients attending ophthalmology outpatient department. There were 43 males and 50 females in diabetic group. The duration of diabetes mellitus ranged from one to fifteen years. The CCT was recorded with optical pachymeter (Optikon). Average of 3 consecutive recordings of CCT was taken for analyses. Blood samples were collected simultaneously when CCT measurement were taken. Blood glucose levels were measured by using glucose oxidase and peroxidase method.

The same procedure was repeated thrice in each patient few days apart. The measurements were taken in the morning hours. Blood glucose levels were correlated with CCT values. Statistical analysis was performed using t-test, univariate analysis.

**RESULTS**

The age group of the patient was from 42 to 74 years in diabetic group with 10 patients between 40-50 age group, 30 in 50-60 age group, 42 in 60-70 age group and 11 in 70 to 80 age group. Non diabetics included 8 patients in 40 to 50 group, 26 in 50-60 age group, 35 in 60 -70 age group and 21 in 70 to 80 age group. Age CCT in diabetic population was 529.8 micron and in non-diabetic patients was 524.7 microns. Blood glucose levels ranged between 90mg% to 460mg% in diabetic population with a mean value of 214mg%, while in non-diabetics it ranged between 80mg% to 160mg% with a mean of 134mg%. CCT in diabetic patients was not significantly different from that in non-diabetic patients. We also noted that diabetic patients (included 6 patients) with high blood glucose levels (blood glucose > 400mg%) had an average CCT value of 534 microns. The variation of CCT at different levels of blood glucose levels averaged 4 microns. There was no significant correlation between blood glucose levels and the CCT values (p= 0.062).

**DISCUSSION**

There has been considerable interest in the impact of some corneal parameters, especially CCT, as a potential determinant of measured IOP and glaucoma risk and/or progression. Measured IOP is affected by CCT in different tonometers. However, this relationship has not been precisely specified, and has been thought to be nonlinear in the range of typical IOP.

Our study reveals that diabetic patients had cornea thicker than non-diabetics by 5.1 microns, though it did not attain statistical significance. CCT levels were higher in uncontrolled diabetic population. The European Glaucoma Prevention Study showed that persons with diabetes had thicker central corneas than persons without diabetes (588 versus 571microns). Larger patient base is necessary which includes larger proportion of uncontrolled diabetic patients to establish the high variation in CCT levels in uncontrolled diabetic patients. There was no significant change in CCT levels on short term fluctuations in blood glucose levels. CCT levels correlate with long term control of blood glucose levels and thus requires to be correlated with glycosylated hemoglobin (HbA1c levels) which indicates control over last 3 months period.

Racial variation influences CCT. This implies that every population will have a unique CCT reading. The varied population bases used by different studies make comparison difficult. However, average CCT of our population (531 ± 33 µm) closely matches that of the African Americans (531.0 ± 36.3 µm), the Japanese (531.7 µm), the Indians (537 ± 34 µm) but is significantly different from that of the Caucasian population (558 ± 34.5 µm). Population surveys done on Caucasians have been the basis for the definition of the “normal” range of IOP. The implications of this difference in average CCT are significant in terms of the correct determination of elevated IOP in our population. Glaucoma patients in our population will need to maintain a lower level of IOP.

**CONCLUSION**

CCT values in diabetic population is not signifi-
Correlation between Central Corneal Thickness & Diabetes in Pakistani Population

Blood glucose levels do not significantly affect CCT values.

REFERENCES


Effectiveness of first Probing in Children with Congenital Nasolacrimal Duct Obstruction & its Pattern in different age Groups

Nuzhat Rahil FCPS¹, Adnan Ahmed FCPS², Rahil Aumir Malik FCPS³

INTRODUCTION:
Congenital nasolacrimal duct obstruction (CNLDO) is a common disorder of the lacrimal system. (CNLDO) affecting up to 20% of all newborns. The nasolacrimal duct usually canalises at 8 months of fetal life but there is commonly a delay in this developmental process which can result in residual membrane tissue or stenosis at any level in the nasolacrimal system - from the canaliculi to the extreme end of the nasolacrimal duct underneath the inferior turbinate. Persistent membranous obstruction at the bottom end of the nasolacrimal duct occurs in up to 70% of neonates (dacryostenosis). However, only 2-4% of newborns exhibit the clinical phenomena of nasolacrimal duct obstruction.

RARELY, there may be other associated abnormalities like agenesis or abnormalities of the puncta, lacrimal sac, duct or absence of valves (valve of Hasner ± valve of Rosenmüller). Very pronounced/severe obstruction is associated with systemic abnormalities in 25% of cases.

Epiphora which develops within 6 weeks of birth, sticky eyes, recurrent conjunctivitis, crusting of the eyelids, baggy swelling over the inner canthal region from which it may be possible to express pus.

These infants may less commonly present for the first time with dacryocystitis. It is bilateral in one third of cases. If congenital nasolacrimal duct obstruction does not resolve spontaneously, standard surgical procedure is nasolacrimal duct probing with a variable success rate.

The timing of surgical intervention is tricky. The fact that spontaneous resolution is likely has to be balanced with the fact that surgical success decreases with age. Current practice is to defer surgery until 12 months of age. At that point, probing of the ducts under a very light anaesthesia may be done. Naso-endoscopy allows direct visualisation of the lower end of the nasolacrimal duct, which increases the accuracy of the procedure. This will clear 95% of those cases where resolution doesn’t occur spontaneously.

Probing may occasionally be considered before age one year if the patient is very symptomatic. ‘Early probing’ results in symptoms resolving immediately in almost all cases (optimum time seems between 4-6 months) - but the long-term consequences of adopting this ‘unnecessary’ procedure are currently unknown and the child is faced with the usual risks associated with simply having a general anaesthetic. If still unsuccessful after 2-3 probing attempts, then a dacryocystorhinostomy (DCR) is performed. Balloon catheter dilation is another, less invasive approach.

Nasolacrimal duct probing is advocated as a primary treatment in children younger than 9 years of age with success rate of 88% before proceeding to more complex treatment options. Unsuccessful probing may result from...
the selection of non membranous (complex) obstructions rather than the increased age of the patients.

The objective of our study was to determine the effectiveness of first probing in children presenting with congenital nasolacrimal duct obstruction. This study shall be quite helpful in our self audit and making recommendations for redeveloping surgical guidelines in case the success rate comes out to be significantly low but in case the success rate comes out to be significantly high, the results than shall be shared among all health professionals and recommendations can be given regarding use of first probing as first line therapy with full confidence. Additionally, this study also focuses on the pattern of effectiveness in different age groups among children under 5 years of age and based upon such pattern we shall be able to conclude and suggest the first probing in particular age group where we find the highest effectiveness rate in our population.

**MATERIALS & METHODS**

This descriptive case series study was conducted at Eye Operation Theatre, Eye Unit of Lady Reading Hospital, Peshawar. Before we start the study, permission from the hospital ethical committee was obtained. An informed written consent was obtained from the parents of patient. The patient was evaluated for inclusion criteria and exclusion criteria as follows.

**Inclusion Criteria:** All children, both male and female, between one to five years of age, having congenital nasolacrimal duct obstruction, not responding to conservative treatment. Children with simple obstruction i.e. associated with dacryostenosis (detected by clinical examination and nasal speculum examination).

**Exclusion criteria:** Children with complex obstruction i.e. punctual agenesis, congenital lacrimal fistula and craniofacial defects (detected by clinical examination and slit lamp examination), children with acute dacryocystitis secondary to infection were excluded. The above mentioned conditions act as confounders and if included will introduce bias in study results.

A special data collection proforma was filled for each patient having a detailed record of the disease including name, age, gender, address, and presence of congenital nasolacrimal duct obstruction. Diagnoses were made according to the patients’ history, clinical examination like the state of the punctum, the canaliculus, the sac, and the nasolacrimal duct. Diagnostic criteria were based upon positive regurgitation test and Fluorescein dye disappearance test. For a dye disappearance test, topical anesthesia was instilled, moistened fluorescein paper was placed into the inferior fornix, excess was wiped away and each eye was evaluated for clearance of the dye at 5 min in a semi darkened room with blue filter light of slit lamp or indirect ophthalmoscope.

The probing was performed under general anesthesia after dilatation of upper punctum. Post operatively the patient was given antibiotic and steroid eye drops, 4 times daily, for 1 week; the patient was evaluated after one month in the eye out patient department to determine the effectiveness in terms of absence of even a single drop of tear on pressing the lacrimal sac.

All the analysis was done in SPSS version 10. Frequencies and percentages were calculated for categorical variables like gender and effectiveness. Mean ± Standard deviation was computed for numerical variables like age. Effectiveness was stratified among age and gender to see the effect modifications. All the results were presented in the form of tables and graphs.

**RESULTS**

This study was conducted at eye Department, Lady Reading Hospital Peshawar in which 165 patients were included. The results were analyzed as: Age distribution among 165 childrens was analyzed as n=66(40%) childrens were in age range 1-2 years, n=53(32%) childrens were in age range 3-4 years and n=46(28%) childrens were in age 5 years. Mean age was 3 years with standard deviation ±1.28. (as shown in Table no 1) Gender distribution among 165 childrens was analyzed as n=96(58%) childrens were male and n=69(42%) childrens were female. Effectiveness of first probing procedure among 165 childrens was analyzed as first probing procedure was effective in n=134(81%) childrens while it was not effective in n=31(19%) childrens. (as shown in Table no. 3)

Association of effectiveness of first probing procedure in age groups was analyzed as among 134(81%) childrens in which the first probing procedure was effective 53 childrens were in age range 1-2 years, 43 childrens were in age range 3-4 years and 38 childrens were in 5 years. (as shown in Table no. 4) Association of effectiveness of first probing procedure in gender was analyzed as among 134(81%) childrens in which the first probing procedure was effective 78 childrens were male and 56 childrens were female.

**TABLE 1: age distribution (n=165)**

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Frequency</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>1 - 2 years</td>
<td>66</td>
<td>40%</td>
</tr>
<tr>
<td>3 - 4 years</td>
<td>53</td>
<td>32%</td>
</tr>
<tr>
<td>5 years</td>
<td>46</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>165</td>
<td>100%</td>
</tr>
</tbody>
</table>

Mean age was 3 years with standard deviation ±1.28

**TABLE 2: Gender Distribution (n=165)**

<table>
<thead>
<tr>
<th>Gender Groups</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>96</td>
<td>58%</td>
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<tr>
<td>Female</td>
<td>69</td>
<td>42%</td>
</tr>
<tr>
<td>Total</td>
<td>165</td>
<td>100%</td>
</tr>
</tbody>
</table>
TABLE 3: Effectiveness of Procedure (n=165)

<table>
<thead>
<tr>
<th>Effectiveness of Procedure</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td>134</td>
<td>81%</td>
</tr>
<tr>
<td>Not effective</td>
<td>31</td>
<td>19%</td>
</tr>
<tr>
<td>Total</td>
<td>165</td>
<td>100%</td>
</tr>
</tbody>
</table>

TABLE 4: Association of effectiveness of procedure in age distribution (n=165)

<table>
<thead>
<tr>
<th>Association of Effectiveness of Procedure in age group</th>
<th>1-2 years</th>
<th>3-4 years</th>
<th>5 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective</td>
<td>53</td>
<td>43</td>
<td>38</td>
<td>134</td>
</tr>
<tr>
<td>Not effective</td>
<td>13</td>
<td>10</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>53</td>
<td>46</td>
<td>165</td>
</tr>
</tbody>
</table>

Chi Square Test was applied in which P Value was 0.003

DISCUSSION

Congenital nasolacrical duct obstruction (CN-LDO) is a common disorder of the lacrimal system. Our study shows that 40% childrens were in age range 1-2 years, 32% childrens were in age range 3-4 years and 28% childrens were in age 5 years. Mean age was 3 years with standard deviation ±1.28. More over 58% childrens were male and 42% childrens were female. These results coincide with the study done by Halipota et al. Similar results were found in study done by Sturrock SM et al in which the long term results of probing for congenital nasolacrical duct obstruction were reviewed using a parental questionnaire issued to both treated and age-matched control groups.

Probing had apparently reduced the symptom rate to a level close to normal for the age group concerned. All studies on the incidence of congenital nasolacrical duct obstruction must be interpreted with reference to the known high rate of spontaneous resolution as a clear trend has been demonstrated towards a lower incidence of symptoms the longer the follow up after probing.

Our study shows that first probing procedure was effective in 134 (81%) childrens while it was not effective in 19% childrens. Similarly a study done by Honavar et al shows that one attempt at probing resulted in resolution in 73.3% (44 of 60) patients. Sixteen patients needed a repeat procedure. The overall success rate was 80% (48 of 60). Two specific types of obstructions of the nasolacrical duct were recognized on probing by the author: membranous and firm. Factors predictive of failure of probing were age older than 36 months, bilateral affection failed conservative therapy, failed earlier probing, dilated lacrimal sac and firm obstruction. Results indicate that probing is a viable primary surgical option for congenital nasolacrical duct obstruction in children who present between 2 and 3 years of age, and identify factors predictive of poor prognosis. Similar observation were noted in study done by Gheman T et al.

Our results shows that among 81% childrens in which the first probing procedure was effective 53 childrens were in age range 1-2 years, 43 childrens were in age range 3-4 years and 38 childrens were in 5 years. While 78 childrens were male and 56 childrens were female. The study conducted by Mannor et al on 142 childrens showed success of nasolacrical duct probing was negatively correlated with increasing age: 92%, 89%, 80%, 71%, and 42% at age 12, 24, 36, 48, and 60 months, respectively (P = .001 at each interval). Increasing severity of epiphora was correlated with increased failure of nasolacrical duct probing. Although the success of nasolacrical duct probing declines with age, probing in older children can remain the first line of treatment. Because increasing frequency of epiphora correlates with failure of nasolacrical duct probing, children with daily epiphora should undergo early nasolacrical duct probing. Similar results were found in study done by Halipota FM et al, Robb R et al.

In our study we observed that with increasing age especially beyond 14 months, the success rate of probing decreased. Beyond the age of 2 years the failure rate is almost 100%. Kashkouli MB et al observed 94% success in patients of less than 9 months of age. The success rate decreased to 84% in the children older than 9 months of age.

Other studies have also shown that probing failure risk increases with increasing age. Delay in probing past 12 months of age is associated with decreased success rate as noted by Clark RA. Results of probing after 18 months of age are comparatively poor as observed by Velthoven. On the contrary, some studies have reported success with probing in children upto 5 years of age15-18. After probing we continued with lacrimal massage and instillation of antibiotic eye drops and waited for 3 months before the subsequent intervention. Some of the patients with residual symptoms were relieved with this treatment. Sturrock, MacEvan and Young also observed that after successful probing there might be some residual symptoms in upto 30% of patients.

CONCLUSION

Congenital nasolacrical duct obstruction is a common paediatric pathology seen in ophthalmology out patient. Conservative treatment in these cases is very effective with massage of lacrimal sac area followed by topical antibiotic eye drops. Probing is carried out in unresponsive cases after the age of 6 months and has very good results.

RECOMMENDATION

We recommend that parents should be properly guided about conservative treatment and lacrimal sac...
message probing should be performed in those cases where there is no improvement with proper continuous conservative treatment.

REFERENCES

Myeloid Sarcoma
Juan Montoro, M.D., & Mar Tormo, M.D.
Hospital Clinico Universitario, Valencia, Spain

A 17-year-old boy presented with a 1-week history of proptosis of the left eye. Physical examination revealed a tumor involving the periorbital region (Panel A). Magnetic resonance imaging revealed an orbital mass (Panel B). Laboratory test results included a hemoglobin level of 89 g per liter, a platelet count of 90,000 per cubic millimeter, and a leukocyte count of 1100 per cubic millimeter. Morphologic examination of a bone marrow aspirate revealed 30% myeloblasts (Panel C, arrow). There were no circulating myeloblasts. A biopsy specimen of the orbital mass showed myeloid sarcoma.

Myeloid sarcoma is a tumor composed of myeloid blasts that occurs at an extramedullary site. Myeloid sarcoma may occur on its own or concurrently with a myelodysplastic syndrome, myeloproliferative disease, or acute myeloid leukemia (AML), as seen in this case; on rare occasions, myeloid sarcoma precedes a diagnosis of AML by months or years. After the patient underwent induction chemotherapy, the mass disappeared and the eye returned to its normal position (Panel D). He subsequently underwent cord-blood transplantation, and at the 6-year follow-up, there was no evidence of recurrence of AML. (Courtesy: NEJM-UK)
Per-operative use & Safety of 0.5% Intracameral Moxifloxacin Ophthalmic solution as a Prophylaxis during Cataract Surgery to prevent early Post-operative Endophthalmitis

Junaid F. Wazir FCPS, M.Sc1, Imran Ahmed MBBS2
Inayat U. Khan FCPS3, Janzeb FCPS4

ABSTRACT:
Purpose: To evaluate the per-operative use of 0.5% intracameral moxifloxacin ophthalmic solution as a prophylaxis during cataract surgery to prevent early post-operative endophthalmitis and safety.

Material and Methods: This prospective study was conducted in the Department of Ophthalmology Khyber Teaching Hospital, Peshawar, from October, 2010 to September 2011 and comprised of 200 patients. The patients were divided into two groups. Group 1 received 0.1 ml of intracameral moxifloxacin 0.5 % ophthalmic solution at the conclusion of the surgery and the patients in the group 2 were not given the intracameral antibiotic. None of the patients was given postoperative sub conjunctival antibiotic and steroid injection. All patients were examined for AC reaction and pachymetry was done preoperatively and postoperatively (first day, first week and fourth week postoperatively). Anterior chamber reaction and pachymetry values between the two groups were compared. Statistical analysis was done by using paired sample t test. P-value of less than 0.05 was taken as significant.

Results: There was no statistically significant difference in corneal oedema (measured by pachymetry) between the two groups on the first postoperative day (p=624), and one month postoperatively (p=0.186). Anterior chamber reaction on the 1st postoperative day was not different in both groups (p=0.610). At 4 weeks there was no reaction in any patients and corneal thickness was also restored to preoperative level.

Conclusion: Intracameral moxifloxacin 0.5% ophthalmic solution seems to be safe in terms of AC reaction and endothelial toxicity.

INTRODUCTION
Postoperative endophthalmitis is one of the most feared complications of cataract surgery as it seriously compromises vision. Although timely diagnosis and delivery of appropriate treatment do help in management,1 but in our set up the diagnosis is usually delayed as patients present late due to multiple reasons. It is in the last two decades that the prevalence of the staphylococcus epidermidis as a common cause of endophthalmitis has been recognized. The organisms which were previously considered to be harmless commensals are quite capable of causing endophthalmitis.2 Multiple studies have been carried out to evaluate the bacterial contamination of anterior chamber fluid aspirates after surgery. Srinivasan R and colleagues found 15% of AC aspirates to be positive for bacterial growth in which the staphylococci species were the commonest.3 None of their patients developed infection as probably the inoculum size, host response, prophylactic antibiotics and improvement in the surgical technique have their role. Improvements in technique of surgery and prophylactic measures have had a beneficial effect, but despite this the incidence of endophthalmitis after cataract surgery has increased from 1994-2001 with reported incidence of 2.15 per 1000 cases.4 Thus there still remains the need for protective antibiotics to combat the rise in the incidence of endophthalmitis and to treat the patients in a better way.

In addition to topical antibiotics many surgeons use intracameral antibiotics to prevent the infection. Among the antibiotics which are given through intracameral route, most common are vancomycin and cefuroxime.5 Although retrospective analysis suggests that there has been decrease in the risk of endophthalmitis with vancomycin.6 Vancomycin has also been shown to increase the risk of cystoid macular oedema after cataract surgery.7 Moreover, there are reports of emergence of resistant strains of many bacteria.8 Because of all these facts the routine prophylactic use of vancomycin in cataract surgery is now discouraged worldwide.9 Cefuroxime and cefazoline are two other medicines which are being used as intracameral antibiotics. The recent publication of ESCRS study has demonstrated that cefuroxime significantly decreases the risk for developing endophthalmitis after phacoemulsification cataract surgery.10 Both of these as well as vancomycin are available as systemic preparations. They have to be reconstituted before delivery into the eye. Reconstitution of a drug increases the risk of toxic anterior segment syndrome (TASS).11 TASS is an acute in-
flammation of anterior segment after cataract surgery. A variety of substances have been implicated including inappropriately reconstituted intraocular preparations. Incorrect PH and incorrect osmolality can also cause TASS. Another problem with vancomycin and cephalosporin is that they have time dependant efficacy. As the concentration of drug in AC decreases four times in first hour, so, this makes them a poor choice.

Considering the problems associated with the vancomycin and cephalosporin, the new antibiotic under consideration is moxifloxacin which is a fourth generation fluoroquinolone. Forth generation quinolones have already surpassed the second generation as the antibiotics of choice in cataract surgery.12 They have a wide spectrum of activity and they carry a lower risk of resistance developing against them. Moxifloxacin is available as self preserved ophthalmic solution. The self preserved nature of the medicine has led to its use as prophylactic intracameral injection. Fluoroquinolones are concentration dependant drugs. If they are put in AC in high enough dose they rapidly kill the bacteria. No special preparation is required for intracameral delivery, no millipore filter is needed and the syringe is easily identifiable by the faint yellow colour of the solution. Earlier studies had shown no toxicity with intracameral or intra-vitreal injection of Moxifloxacin in animal eye.13 The aim of this study is to check the safety profile of 0.5% moxifloxacin available as self-preserved vagamox and given as intracameral injection during cataract surgery.

MATERIAL AND METHODS

This case control comparative study was conducted at Khyber Teaching Hospital, Peshawar from October, 2010 to September, 2011. 200 patients were enrolled for the study. 100 patients were injected intracameral moxifloxacin at the end of the surgery and they were put in group 1 whereas 100 patients (controls) were operated in routine way and were placed in group 2. None of the patients were given sub conjunctival antibiotic and steroid injection at the end of the surgery. Patients with glaucoma, retinopathy, maculopathy, media opacity other than cataract, uveitis and corneal endothelial disease were not included in the study. Patients who suffered intra-operative complications or those who had prolonged or complicated surgery were also excluded from the study.

Preoperative examination included uncorrected and corrected visual acuity, slit lamp examination, tonometry, fundoscopy and pachymetry. All patients were admitted one day prior to surgery. Biometry was done on the day of admission. On the day of surgery pupils were dilated with 1% tropicamide and 10% phenylephrine. Fifty two percent of surgeries were performed under local and 48% were done in topical anaesthesia. Phacoemulsification was performed by single surgeon through 3.2 mm clear corneal incision and 5.25 mm PPMA IOL was implanted after enlarging the incision. No suture was applied in any case.

The prophylactic regimen to reduce the risk of infection included topical 10% povidone-iodine on the periorbital skin, 5% povidone iodine in the conjunctival sac and eye lashes, draping of the eyelashes and periorbital region, topical antibiotic drops one day prior to and on the day of surgery. At the start of the operating day a new bottle of moxifloxacin was opened and the contents of newly opened bottle were aspirated in 10cc syringe by the operating assistant. 0.1 ml of 0.5% pure moxifloxacin was aspirated in each of 1 cc tuberculin syringe before every case. The undiluted solution was injected in the anterior chamber at the end of the surgery. Postoperatively, for the infection control, the patients were given combination of topical 3 mg/ml tobramycin with 1 mg/ml dexamethasone every 2 hours along with systemic ciprofloxacin 500 mg twice daily for five days.

Patients were examined on the first postoperative day and further visits were scheduled at 1 week and 4 weeks interval. On each visit visual acuity was recorded, slit lamp examination was done for AC reaction. It was expressed as cells and flare and graded using Hogan and Kimura grading system. Pachymetry was done on each visit. Data was entered and analyzed using SPSS version.14 Student t-test was used to analyze the data. A p-value of less than 0.05 was considered significant.

RESULTS

All patients completed the follow up. Mean age of our patients in group 1 was 59 ± 6.22 (SD) and 58.75 ± 6.86 (SD) in group 2. All patients had variable corneal edema on 1st postoperative day as demonstrated by pachymetry. The mean preoperative pachymetry in group 1 was 519.56 ± 25.52 and group 2 was 517.30 ± 22.80. On first postoperative day it was 552.29 ± 26.26 in group 1 and 550.90 ± 21.30 in group 2. The difference in preoperative and postoperative 1st day pachymetry was significant in both groups (p=0.00). At one month, the pachymetry was 531.01 ± 26.76 group1 and 517.68 ± 21.87 in group 2. The difference between the preoperative and one month post operative corneal thickness was insignificant (p=0.32 and 0.672 respectively). Corneal thickness of two groups after 1st day and one month of surgery was almost the same, and the difference was found to be statistically insignificant (p=0.624 and p=0.186).

The difference in anterior chamber reaction in terms of cells and flare in both groups is insignificant (p=0.610 for cells and p=0.566 for flare) on the first postoperative day. At final visit there was no reaction in any patients.
Table 1: Corneal thickness observed by pachymetry (in micrometers) (n=100)

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
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<tbody>
<tr>
<td>Pre operative</td>
<td>Mean: 519.56 SD: 25.52</td>
<td>Mean: 517.30 SD: 22.80</td>
</tr>
<tr>
<td>Post operative 1st day</td>
<td>552.29</td>
<td>550.90</td>
</tr>
<tr>
<td>Post operative 1 month</td>
<td>552.29</td>
<td>550.90</td>
</tr>
</tbody>
</table>

Table 2: Anterior chamber reaction observed as cells and flare (n=100)

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cells</td>
<td>Mean: 1.97  SD: 0.76</td>
<td>Mean: 1.92  SD: 0.74</td>
</tr>
<tr>
<td>Flare</td>
<td>Mean: 1.34  SD: 0.59</td>
<td>Mean: 1.33  SD: 0.57</td>
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Table 3: Paired sample t test (n=100)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Significance</th>
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<tr>
<td>Post operative corneal thickness (1st day)</td>
<td>1.390</td>
<td>28.26</td>
<td>0.624</td>
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<tr>
<td>Post operative corneal thickness (1 month)</td>
<td>4.080</td>
<td>30.64</td>
<td>0.186</td>
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<tr>
<td>Cells</td>
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</tr>
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</table>

DISCUSSION

The first report of successful prophylactic intracameral antibiotic injection was published in 1977.14 It did not receive significant attention and despite of the efficacy of this technique it was not considered until 2002 when Montan et al published their report in which they described a decreased rate of postoperative endophthalmitis with intracameral injection of 1 mg of cefuroxime.15

Of the prophylactic methods for cataract surgery only povidone iodine is recommended.16 If applied alone it reduces conjunctival flora by 91% for colony forming and 51% for species. If it is used along with topical antibiotic, it produces synergistic effect and leads to sterilization of 83% of the eye.17 Despite its efficacy the rate of endophthalmitis increased after 1994. So, there was a need for protective antibiotic to check this rise in the rate of endophthalmitis. Topical antibiotics which gained popularity in the last few years for infection prophylaxis after cataract surgery were fluoroquinolones.

In 2002 survey of the members of American Society of Cataract and Refractive surgery, Leaning noted that 86% of respondents were using second generation fluoroquinolones,18 whereas in a 2003 survey, only 21% were using second generation and 61% were using fourth generation fluoroquinolones.19 The reason for this change was increasing resistance towards the second generation drugs. Kowalski et al reported in 2001 that none of the staphylococcus aureus isolated from endophthalmitis isolates were sensitive to second generation fluoroquinolones.20 These problems led to the development of forth generation antibiotics. These antibiotics have got a wider spectrum of activity against gram positive organisms which are the most common pathogens causing endophthalmitis. In addition they have a good coverage against gram negative organisms and anaerobes.12 Moxifloxacin is found to be superior in terms of potency to gatifloxacin.21 It seems to be a better choice as a prophylactic antibiotic as it has got lowest minimal inhibitory concentration (MIC). Mather et al did a retrospective study of 93 bacterial endophthalmitis isolates. He found that the MIC levels for Moxifloxacin ranged from 0.06-0.19 mg/ml. Lindsay has shown in his study that Moxifloxacin has good aqueous penetration when given four times a day starting two days prior to surgery and that its concentration exceeds MIC levels for most common pathogens.22 This shows that moxifloxacin can be an effective prophylactic antibiotic even given through topical route. But another important consideration is prevention of development of resistant strains which may develop with prophylactic use of an antibiotic. The drug level at which the development of resistant strains can be prevented is called mutation prevention concentration (MPC).

It is another parameter of evaluation of potency of an antibiotic. Frequent and suboptimal use of an antibiotic increases the risk of development of resistant mutants. The MPC of fluoroquinolones is 8-10 times their MIC.23 Achieving concentrations higher than this almost ensures the prevention of mutation. With topical use the aqueous concentration of Moxifloxacin levels or slightly exceeds its MPC, whereas with intracameral injection it achieves and ensures much higher concentration than its MPC (0.38 - 2.16mg/ml). We injected 0.1 ml of pure vigamox 0.5% ophthalmic solution without dilution in the AC at the end of the surgery. This is equivalent to 0.5 mg of moxifloxacin. Bolino and his colleagues used the same concentration and calculated the concentration of Moxifloxacin in AC to be 952 mg/ml, which is 300 times its MIC and at least 30 times its MPC.24

Our concern was to check the effect of intracameral Moxifloxacin on cornea for which we examined the cornea clinically for striate and quantitatively by performing pachymetry before and after surgery. The other concern was effect of Moxifloxacin on blood aqueous barrier and whether it causes inflammation or not. The patients were examined for aqueous flare and cells on the first post operative day and on the scheduled vis-
its. The patients were followed for four weeks because in previous studies it has been suggested that wound healing is complete in four weeks and preoperative corneal thickness is also restored in four weeks. Moreover as the eye is usually quiet and the patients have no problem after that time, we loose follow up mostly after 4-6 weeks of surgery.

We found that the patients who were injected with intracamerel Moxifloxacin had almost the same AC reaction as controls and that the corneal thickness that occurred after the surgery was not significantly different in two groups. Corneal thickness was restored to the preoperative levels and there was no sign of inflammation in AC at four weeks of surgery. This suggests that intracameral Moxifloxacin is not toxic to endothelium and it does not cause significant inflammation. The results of our study are supported by Espiratu et al who used the same concentration of intracameral moxifloxacin.23 Steve A. Arshinoff has also recommended the routine use of intracameral Moxifloxacin although he has used much lesser concentration of the antibiotic in AC.24

CONCLUSION

Intracameral Moxifloxacin 0.5% ophthalmic solution appears to be non toxic to eye in terms of AC reaction and endothelial damage.

REFERENCES

IOP and Fundus Changes in Pregnancy

Danish Zafar FCPS1, Zulfiqar Ali FCPS2, Abdus Salam Arif3

ABSTRACT

Objective: Pregnancy results in a lot of hormonal changes in the body and the eyes are no exception. These ocular changes could be physiologic, pathologic or a modification of a pre-existing condition. Pregnancy represents a real challenge to all body systems. Physiological changes can involve any of the body organs and systems. The ocular effect of pregnancy involves a wide spectrum of physiologic and pathologic changes. The latter might be presenting for the first time during pregnancy such as corneal melting and corneal ectasia, or an already existing ocular pathologies that may be modified by pregnancy such as diabetic retinopathy and glaucoma. In addition, pregnancy can affect vision through systemic disease that are either specific to the pregnant state itself such as the pre-eclampsia/eclampsia and Sheehan’s syndrome or systemic diseases that occur more frequently in relation to pregnancy such as Graves’ disease, idiopathic intracranial hypertension, anti-phospholipid syndrome, and disseminated intravascular coagulation. The aim of this study was to determine ocular changes that are associated with pregnancy.

Materials and Methods: A total of 150 women were followed longitudinally throughout the course of their pregnancy and 6 weeks postpartum. The women were recruited at 8 weeks of pregnancy at the anti-natal clinic in the Department of Obstetrics and Gynecology, Howa Sudair Hospital, Riyadh, Saudi Arabia. The women were aged between 20 and 38 years. Tests carried out included visual acuity, ophthalmoscopy, and tonometry. The tests were carried out in each of the three trimesters of pregnancy and 6 weeks postpartum.

Results: There was a fall in intraocular pressure across the trimesters and this was very significant (P<0.0001). During postpartum, the intraocular pressure began to rise. The difference between the third trimester and post-partum values were also statistically significant (P< 0.0001). 22 patients had pre-eclampsia and out of which 6 patients developed full blown eclampsia with fits, all these patients with pre-eclampsia showed mild hypertensive retinopathy, 1 out of 4 eclamptic patients had CSR. 68 patients were known diabetics, out of which 58 have non-proliferative diabetic retinopathy (NPDR), and 10 patients had early proliferative changes, which worsened during the course of the disease, for which they underwent PRP. 10 patients had raised blood sugar for first time during pregnancy with no fundus changes.

Conclusion: Ocular changes associated with pregnancy are transient and most tend to resolve during post partum period, proliferative diabetic changes enhanced during the course of pregnancy, so they should be closely observed.

Key Words: ocular, pregnancy, intraocular pressure, CSR

INTRODUCTION

Differences in ocular physiopathology exist between males and females. These differences can be observed in the lacrimal and other eye-associated glands, the ocular surface, the crystalline lens, and the retinchoroid complexes. Literature on the subject revealed that because of sex steroid hormone (estrogen, progesterone, and androgen) actions, various physiological conditions such as age, menstrual cycle, pregnancy, and menopause, where the hormone milieu changes, affect vision. Pregnancy results in a lot of hormonal changes in the body and the eyes are of no exception. These ocular changes could be physiologic, pathologic or a modification of an existing condition, the most common being proliferative diabetic retinopathy. Most of the physiologic changes that occur as a result of pregnancy are usually marked in the third trimester. This is because at this period, hormonal activity is at its peak. However, these changes are transient because several weeks postpartum, all hormonal activities return to their pre-pregnant state.4 studies have shown that because of hormonal influences, pregnancy brings about changes in refractive status, cornea sensitivity, visual acuity, and intraocular pressure.5-6 Reports of ocular changes during pregnancy have been mostly presented anecdotally or in small case series. While most of the described changes are transient in nature, others extend beyond delivery and may lead to permanent visual impairment.7-9 Therefore, it is important to be aware of physiologic changes as well as of the potential effects on pre-existing disease and complications in order to counsel and advice women who currently are, or are planning to become pregnant.

MATERIALS AND METHODS

This study was a longitudinal one. One hundred and fifty pregnant women in their first trimester of pregnancy were followed throughout the course of pregnancy. These women were recruited in the 8th and 10th week of pregnancy. 150 pregnant women were recruited at the antenatal clinic of the Department of Ob-
stetrics and Gynecology, Howta Sudair Hospital, Saudi Arabia. The pregnant women were between the ages of 20 to 38 years, while some were primigravidae, others were multigravidae. Examinations were conducted in the three trimesters of pregnancy and 6 weeks postpartum. All information was gathered through detail performa and informed consent. After measuring systolic and diastolic blood pressure, a full ophthalmic examination was carried out on them. This included measurement of distant visual acuity (VA) using the Snellen’s chart. Ophthalmoscopy was done using the monocular direct ophthalmoscope, indirect 90 D S/L examination and finally, intraocular pressure was measured using the Goldman applanation tonometer, with 0.5% proparacaine topical anesthetic. Random blood sugar was also done. All tests were done between the hours of 8 am .10 am on every anti-natal clinic visit, to avoid diurnal variation in intraocular pressure. Data was analyzed through SPSS version 10 standard, mean and p value were calculated for IOP.

RESULTS

There was a fall in intraocular pressure (IOP) across the three trimesters of pregnancy and this was extremely significant P<0.0001. The difference between the values in the third trimester and 6 weeks postpartum was also statistically significant P<0.0001. [Table 1, Figure 1].

<table>
<thead>
<tr>
<th>No of patients</th>
<th>No/Mild fundus changes</th>
<th>Hyperstensive retinopathy</th>
<th>Non Proliferative Changes</th>
<th>Proliferative Changes</th>
<th>CSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>16/6</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>68</td>
<td></td>
<td>58</td>
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<td>60</td>
<td>60</td>
<td></td>
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</tr>
</tbody>
</table>

Total number of patients= 150

DISCUSSION

During pregnancy, various physiological changes take place in the body due to the hormonal effects of the placenta. These placental hormones have effects on most organ systems, including the eyes. In this study, the changes in intraocular pressure (IOP) during pregnancy were significant in this study. IOP was found to reduce consistently during the different trimesters, as the pregnancy advances, with the lowest pressure in the third trimester. The finding that the third trimester of pregnancy has an ocular hypotensive effect is consistent with other studies.\(^{10-14}\) The normal intra-ocular pressure may decrease slightly due to certain hormonal and circulatory changes. This could be advantageous to patients suffering from glaucoma, a condition where the raised intra-ocular pressure damages the optic nerve that transmits visual information to the brain.\(^{15,16}\) The physiological mechanism responsible for the decrease in IOP during pregnancy is not well known.

A number of mechanisms have been postulated. Among them is that decreased IOP in pregnancy is due to elevated hormonal levels which cause an increase in fluid outflow conduction without altering the rate of fluid entry.\(^{17}\) It is well documented that levels of progesterone and estrogen change during pregnancy. Estrogen causes dilatation of the vessels of the circulatory system leading to decreased arterial pressure and thus a reduction in aqueous humor production.\(^{17,18}\) This could explain the reduced intraocular pressure reported in this study. During pregnancy, the extreme quantities of estrogens cause the release of relaxin which softens the pelvic ligaments of the mother, so that the sacroiliac joints become relatively limber and the symphysis pubis becomes elastic.\(^{19,20}\) These changes make for easier

---

**Table 1**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>First Trimester</th>
<th>Second Trimester</th>
<th>Third Trimester</th>
<th>Postpartum</th>
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</thead>
<tbody>
<tr>
<td>Mean IOP(mmHg)</td>
<td>14.70</td>
<td>13.20</td>
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</tr>
<tr>
<td>SD</td>
<td>2.20</td>
<td>2.00</td>
<td>1.30</td>
<td>1.80</td>
</tr>
<tr>
<td>SEM</td>
<td>0.24</td>
<td>0.22</td>
<td>0.14</td>
<td>0.19</td>
</tr>
<tr>
<td>N</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

IOP =Intraocular pressure; SD=Standard deviation; SEM = Standard error of mean; N= Number of subjects
IOP and Fundus Changes in Pregnancy

...of the fetus through the birth canal. Philips and Gore\textsuperscript{18} suggested that this softening of ligaments in late pregnancy might extend to the ligament of the corneo-scleral envelope to produce reduced corneo-scleral rigidity and therefore cause a fall in IOP.

The number of women with diabetes in pregnancy is increasing, partly as a reflection of increasing obesity in women of child-bearing age.\textsuperscript{25} DR is the most common ocular condition modified by pregnancy and is associated with an increased risk of development and progression of DR.\textsuperscript{21-24} DR developing during pregnancy may show a high-rate of spontaneous regression after delivery. In a study of patients with no DR at onset, developed mild non-proliferative DR (NPDR) during pregnancy, 50% had complete regression, and 30% had partial regression of DR after delivery.\textsuperscript{25} Factors that have been shown to influence the progression of DR in pregnancy include, the pregnant state itself, duration of diabetes, degree of retinopathy at time of conception, metabolic control of diabetes, and the presence of co-existing hypertension.\textsuperscript{26} The exact pathogenesis for the progression of DR during pregnancy remains controversial. Some studies demonstrated a decrease in retinal venous diameter and volumetric blood flow in diabetic patients during pregnancy and hypothesized that this may exacerbate retinal ischemia and hypoxia.\textsuperscript{27,28} On the other hand, several studies have reported an increase in retinal blood flow in diabetic patients during pregnancy and suggested that this hyper-perfusion causes an added stress to an already compromised retinal circulation leading to the progression of Diabetic retinopathy (DR).\textsuperscript{29}

Several studies have shown that higher glycated hemoglobin (HbA1C) levels at conception and the rapid tightening of glycemic control during pregnancy have been associated with a higher risk of DR progression. The diabetes in early pregnancy study showed that elevated HbA1C at baseline was associated with a higher risk of retinopathy progression and the rates of progression almost doubled in women with HbA1 levels greater than 6 standard deviation above the control mean.\textsuperscript{29} Diabetic women in child-bearing age should be counseled regarding the risk of development and progression of DR. The risk of retinopathy progression during pregnancy is higher in patients with inadequate glycemic control, thus, whenever possible, tight glycemic control should be attained before conception.\textsuperscript{30} Patients with severe NPDR or proliferative DR (PDR) are at a higher risk of progression during pregnancy thus, it is advisable to postpone conception until stabilization of their ocular disease.\textsuperscript{30} Diabetic patients with PDR during pregnancy should be managed the same way as non-pregnant patient. The prevalence of GDM(Gestational diagnosed DM) in a population is reflective of the prevalence of type 2 diabetes in that population. In low-risk populations, such as those found in Sweden, the prevalence in population-based studies is lower than 2% even when universal testing is offered, while studies in high-risk populations, such as the Native American Cree, Northern Californians, and Northern Californian Asians, reported prevalence rates ranging from 4.9% to 12.8%. Prevalence rates for GDM obtained from hospital-based studies similarly reflect the risk of type 2 diabetes in a population with a single hospital-based study in Australia reporting prevalence ranging from 3.0% in Anglo-Celtic women to 17.0% in Indian women. In our studies the incidence of newly diagnosed cases during pregnancy is 15% which is quite high as compared to other studies. It can be because of high obesity rate in Saudis and limited number of studied population. Central serous chorio-retinopathy (CSR) is an idiopathic disease characterized by serous detachment of the neurosensory retina in the macular region secondary to a focal retinal pigment epithelial defect. CSR predominantly affects young and middle-aged males between 20 and 50 years of age. However, there are reports of CSR in females.\textsuperscript{31-35} Although CSR is generally unilateral, bilateral cases can occur. The presenting symptoms are often blurred vision, central scotoma, micropsia, or metamorphopsia. The disease is generally self-limited, with spontaneous resolution within 3 months.\textsuperscript{36} Risk factors for CSR include stress, steroids, pregnancy, systemic hypertension. There is a unique association between pregnancy and CSR; however, studies on the incidence of CSR in pregnant women are rare. Interestingly, the literature is rife with case reports about pregnant women with CSR. Kitzmann et al.,\textsuperscript{37} reported the results of a population-based study on the incidence of CSR in Olmsted, Minnesota from 1980 to 2002 and found 11 females with CSR confirmed by fluorescein angiography, one of who was pregnant (9%). Kitzmann et al.\textsuperscript{37} also reported nine cases of CSR without confirmation by fluorescein angiography, pregnancy was one of the risk factors affecting this group (one patient). In our study we have only 1 patient with serous detachment at posterior pole, known diabetic and with history of eclampsia. She had spontaneous resolution after 3 month follow up.

CONCLUSION

Ocular changes are common in pregnancy. Although these changes are transient and resolve at postpartum, it can have an impact on the course of a pre-existing ocular disease, or it can be associated with the development of a new disorder, like central serous chorio-retinopathy and diabetes. Family physicians and obstetricians who take care of these women should have a firm understanding of the various ocular changes associated with pregnancy and the implication they
may have for management.

REFERENCES
To Determine the frequency of Common Complications following Cataract Surgery by an experienced Surgeon in Diabetic Patients

Afzal Qadir FCPS¹, Irfanullah Shah MBBS², Mohammad Bilal MBBS³
Umer Khan MBBS⁴, Lal Mohammad⁵, Muhammad Kashif Kamran⁶

ABSTRACT

Objectives: To determine the frequency of common complications following cataract surgery by experienced surgeon in diabetic patients in our setup.

Material and Methods: A prospective descriptive interventional case series. Department of Ophthalmology, Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Peshawar, from June 2011 to September 2012. One hundred and twenty nine eyes of 129 patients were selected for this study.

Results: Of the total 129 eyes of the diabetic patients above 40 years of age and duration of diabetes at least 5 years, fifty nine (45.7%) were males and seventy (54.3%) were females. MSICS was performed in all the eyes. Uveitis was the most common complication found in twenty (15.50%) eyes, while progression of Diabetic Retinopathy being the least common found in only ten (7.75%) eyes. Worse visual acuity observed in fourteen (10.85%) eyes. Striate Keratopathy and posterior capsule opacification were found in sixteen (12.40%) and fifteen (11.62%) eyes respectively.

Conclusion: The most common complication observed was Uveitis accounting for 15.50% of the cases, followed by striate keratopathy (12.40%), posterior capsule opacification (11.62%), worse visual acuity (10.85%) and progression of Diabetic Retinopathy the least common found in only 7.75% eyes.

Key words: Cataract, Diabetes Mellitus, Uveitis, Posterior capsule opacification, Striate Keratopathy, Progression of Diabetic Retinopathy.

INTRODUCTION

Epidemiologic data suggests that there is an increasing incidence of Diabetes Mellitus (DM) in developing countries.¹ The global prevalence of DM was estimated to be 2.8% in the year 2000 and is expected to reach 4.4% by 2030.² In Pakistan 17.50% of the adult population has DM.³ Individuals with diabetes are 25 times more likely to become blind than individuals without this disease.³ Cataract occurs at a relatively younger age and 2-5 times more frequently in patients with DM. Hence the cataract surgery is often carried out earlier in diabetics especially in developing countries.⁴ Besides visual improvement, diabetic patients needs cataract surgery for the assessment of retinopathy and to allow laser therapy if needed.⁵ Therefore the rate of cataract surgery is correspondingly higher in these patients. Overall up to 20% of all cataract surgeries are estimated to be performed in diabetic patients.¹

In normal individuals, the visual outcome following cataract surgery is generally excellent, but in diabetic patients the cataract surgery is more challenging. Patients with diabetes may have poor visual outcome and higher complication rates than normal individuals.¹ A recent study has reported improvement in visual acuity in 84.2% of the diabetics and in 90% of the non-diabetics following cataract surgery.¹ Hence the visual outcome was worse in diabetics (15.8%) as compared to non-diabetic (10%) patients.¹ Ivancic, et al have reported post-operative keratopathy in 28%, uveitis in 20%, posterior capsular opacification in 22% (mild) and 16% (severe), progression of diabetic retinopathy in 14% and development of diabetic maculopathy in 6% of patients.² Some studies had reported that cataract surgery in diabetic patients is more frequently accompanied by increased incidence of post-operative inflammation, infective endophthalmitis and posterior capsular opacification.³,⁶,⁷ At the same time progression of retinopathy, rubeosis iridis, increased incidence and severity of macular edema with ultimate increase in visual morbidity is also reported.³,⁷,⁸

The cataract related visual morbidity in diabetic population at an earlier age has a significant impact on the working age individuals, which may have ultimate profound adverse effect on the socioeconomic conditions of our society. Furthermore, the increasing incidence of DM in developing countries like Pakistan necessitates an assessment of the surgical outcome of diabetic cataract among the affected subjects. The aim of this study was to investigate the frequency of common complications following cataract surgery in dia-

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Received: Oct’2013  Accepted: Dec’2013
Diabetic patients. The rationale of the study is that, if in our study the frequency of complications following cataract surgery in diabetic patients comes out significantly higher as compared to other studies, then it can lead to reconsideration of the existing guidelines of the pre-operative assessment, operative techniques and post-operative care of the diabetic patients undergoing cataract surgery.

MATERIAL AND METHODS

A prospective descriptive interventional case series. Department of Ophthalmology, Khyber Institute of Ophthalmic Medical Sciences, Hayatabad Medical Complex, Peshawar, from June 10, 2011 to September 20, 2012. One hundred and twenty nine eyes of 129 patients. Inclusion criteria all the diabetic patients with duration of diabetes ≥5 years and having cataract with best corrected visual acuity (BCVA) of < 6/18 were included. Eyes with mild, moderate or severe NPDR or PDR stage of diabetic retinopathy were included. Patients from both gender and age more than 40 years were included. Exclusion criteria were any patient with comorbidities if detected pre-operatively during slit lamp examination like vascular occlusions, optic atrophy, maculopathy due to myopia or age related macular degeneration (ARMD), corneal opacities and corneal curvature abnormalities, which may affect ultimate visual prognosis, was excluded. Patients with traumatic and complicated cataracts were excluded through history and slit lamp examination. The above mentioned conditions act as confounders and if included will introduce error in the study results.

All the patients meeting the inclusion criteria were admitted in eye ward through the Out Patient Department (OPD). Diagnostic criteria for inclusion was known diabetics or fasting plasma glucose level of ≥ 126mg/dl or random plasma glucose level ≥ 200mg/dl on laboratory investigations and opacification in the crystalline lens with baseline BCVA of <6/18 and Diabetic Retinopathy (DR) of mild, moderate, severe NPDR or PDR stage. Informed written consent was obtained from all the study patients. The patient’s history and VA was recorded at presentation. Both eyes of the patient including detailed fundus examination were performed by consultant ophthalmologist with the slit lamp biomicroscope using 78D lens. Routine investigations were performed for all the study patients on the day of admission.

The patients were operated on the next operation theater (OT) list. Manual Small Incision Cataract Surgery (MSICS) was performed by a single well experienced surgeon. After being operated, all the patients were followed at 1st post-operative day to detect worse visual outcome, posterior capsular opacification and progression of diabetic retinopathy. All the follow-up assessments were carried out under supervision of the single ophthalmologist. All the above mentioned information including the patient’s name, age, sex, address and duration of diabetes were recorded in a proforma. Strict exclusion criteria was followed to control confounders and bias in the study results. post-operative complications including Worse Visual Outcome (WVO), Striate Keratopathy (SK), Uveitis (Uv), Posterior Capsular Opacification (PCO) and Progression of Diabetic Retinopathy (PODR). Results were stratified among age, sex and duration of DM to see the effect modification. All the results were presented in the form of tables and graphs.

RESULTS

One hundred and twenty nine eyes of 129 diabetic patients above 40 years of age diagnosed as having cataract and fulfilling the inclusion criteria were included in this study. All the study patients completed the 40 days follow-up period. The study was conducted at KIOMS Hayatabad Medical Complex, Peshawar from June 2011 to June 2012. The minimum age at which the patient presented was 42 years while the oldest patient was 85 years of age with a mean of 57.9 and SD ±8.7. Sixty one (47.3%) patients presented in the age group of 51-60 years, making it the most common decade of presentation for diabetic patients with cataract. Details regarding age of our study population are given in Table I.

Among the study patients, the minimum duration of diabetes was 5 years while the maximum was 22 years, with mean of 9.7 and SD ±3.9. Sixty nine (53.6%) patients presented with duration of diabetes ranging from 6 to 10 years. Details regarding duration of DM in our study patients are given in Table II. Out of the total 129 patients, fifty nine (45.7%) were males and seventy (54.3%) were females. The male to female ratio was 1:1.2.

Complications following cataract surgery: Out of the total 129 patients, Uveitis was the most common complication found in twenty (15.50%) eyes, while PODR being the least common found in only ten (7.75%) eyes. Worse visual acuity was observed in fourteen (10.85%) eyes, hence there was improvement in visual acuity in 89.15% of the study cases. Striate Keratopathy and PCO were found in sixteen (12.40%) and fifteen (11.62%) eyes respectively. Among the study patients, 15.7% were found to have more than one complication during their follow-up visits. Eighty eight (68.2%) eyes were found to have none of the defined complications (Table III, IV). Complications were observed more frequently in the age group 51-60 years as compared to
the other age groups. Among the study cases, fourteen (23.72%) male and twenty seven (38.57%) female patients were observed to have complications following cataract surgery. Hence the female gender was associated with more frequent complications as compared to the male.

The frequency of complications was highest in patients with 10 years duration of diabetes.

### Table I: Distribution of age (N=129)

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<thead>
<tr>
<th>Age (years)</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
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</thead>
<tbody>
<tr>
<td>41-50</td>
<td>32</td>
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<tr>
<td>51-60</td>
<td>61</td>
<td>47.3</td>
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<tr>
<td>61-70</td>
<td>26</td>
<td>20.2</td>
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<tr>
<td>71-80</td>
<td>8</td>
<td>6.2</td>
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<tr>
<td>81-90</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Total</td>
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</tr>
</tbody>
</table>

### TABLE II: Duration of diabetes mellitus (DM) (n=129)

<table>
<thead>
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<th>Duration of DM (years)</th>
<th>Frequency (n)</th>
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</tr>
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<tr>
<td>5.00</td>
<td>20</td>
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</tr>
<tr>
<td>6-10</td>
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<tr>
<td>11-15</td>
<td>26</td>
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<tr>
<td>Total</td>
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### TABLE III: Frequency of complications (n=129)

<table>
<thead>
<tr>
<th>Complications</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WVO</td>
<td>14</td>
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</tr>
<tr>
<td>SK</td>
<td>16</td>
<td>12.40</td>
</tr>
<tr>
<td>Uv</td>
<td>20</td>
<td>15.50</td>
</tr>
<tr>
<td>PCO</td>
<td>15</td>
<td>11.62</td>
</tr>
<tr>
<td>PODR</td>
<td>10</td>
<td>7.75</td>
</tr>
</tbody>
</table>

WVO= worse visual outcome; SK= striate keratopathy; Uv= uveitis; PCO= posterior capsular opacification; PODR= progression of diabetic retinopathy

### DISCUSSION

In my study the indication for surgery in all the patients was for visual improvement or to augment retinal assessment and laser application. Therefore, cataract surgery has meanings of visual rehabilitation, diagnostic and therapeutic purposes in diabetic patients. Advanced cataract presenting for surgical removal is still widespread in this region similar to that reported previously. This poses a challenge in the management of this group of patients since diabetic maculopathy and retinopathy are common causes for poor visual outcome following cataract extraction in diabetics. In fact cataract surgery should be performed earlier in diabetic patients before the development of diabetic maculopathy or retinopathy as compared to their non-diabetic counterparts. This will ensure both the timely assessment of the status of retina in diabetic patients and prevent progression of DR as cataract surgery itself is a recognized risk factor for the development and progression of DR and diabetic macular edema.

A recent study had reported WVO in 15.8% of the diabetic patients followed for 6 months after cataract surgery. Hence there was improvement in post-operative VA in 84.2% of the cases. In contrast, the results are encouraging in our study in which WVO was observed in 10.85% of the cases with subsequent improvement in post-operative VA in 89.15% of the patients. This difference in results may be due to the short follow-up in our study. This finding supports previous reports that diabetic patients, those with maculopathy and retinopathy may have valuable visual improvement after cataract surgery. Schrey et al reported WVO in 16.2% and improvement in VA in 83.8% of the eyes followed for up to 3 years. Similarly Krepler et al had reported WVO in 15% with improvement in VA in 85% of the cases. Corneal sensitivity is decreased in proportion

### TABLE IV: Diabetes duration vs complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Duration of Diabetes (Years)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>WO/PCO</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WVO/PODR</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SK</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Uv</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>PCO</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>PODR</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nill</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Uv/SK</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Uv/PODR</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WVO/Uv/SK/PCO</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>14</td>
</tr>
</tbody>
</table>

WVO= worse visual outcome; SK= striate keratopathy; Uv= uveitis; PCO= posterior capsular opacification; PODR= progression of diabetic retinopathy
to both the duration of the disease and the severity of the retinopathy. Corneal abrasions are more common in people with diabetes, presumably because adhesion between the basement membrane of the corneal epithelium and the corneal stroma is not as firm as that found in normal corneas.

Following ocular surgery, recurrent corneal erosions and striate keratopathy are more common in diabetics than in non-diabetics. Ivancic et al had reported post-operative keratopathy in 28% of the diabetic patients, which is much higher than 12.40% in our study. Onakpoya et al reported that the post-operative complications were more frequent among diabetic patients especially the posterior capsular rent, striate keratopathy (21.21%) and fibrinous exudation. The association of DM and Uv has long been known. Like cataract, retinopathy and glaucoma, DM also increases the chances of uveitis. Rothova et al had reported DM in 6% of cases with anterior uveitis. In our study Uv was detected in 15.50% of the patients following cataract surgery. Onakpoya et al reported Uv in 12% of the cases after cataract surgery. Menchini et al reported intraocular inflammation and its sequelae as the most common complication in their study. Similarly Ivancic et al reported that inflammatory reactions and bleeding, which resulted in post-operative keratopathy, fibrinous uveitis and posterior capsule opacity, were the common complications of cataract surgery amongst diabetics.

Opacification of the posterior capsule which is thought to be caused by the postoperative proliferation of lens epithelial cells in the capsular bag remains the most frequent complication of cataract extraction with IOL implantation. The patients with diabetes melitus develop PCO earlier after cataract surgery than their non-diabetic counterparts. Only 11.62% of our patients develop PCO after cataract surgery which is lower than 16% reported by Ivancic et al but higher than 6.06% reported by Onakpoya et al in their study. The PODR is suggested to be caused by the disruption of the blood retinal barrier during surgery and the enhanced inflammation following cataract extraction in diabetic patients. PODR was seen in 7.75% of eyes in our study. This percentage is quite lower than that seen in many recent series of phacoemulsification and ECCE in diabetic patients (Antcliff et al, 34%; Polack et al, 38%; and Henricsson et al, 43%) however, conclusions drawn from comparison between studies with different patient populations and levels of preoperative retinopathy were not free of errors.

Diabetics with co-existing cataract presenting for surgery have an overall good visual outcome and cataract surgery should not be discouraged in these patients. However, proper pre-operative assessment is needed and extra precaution needs to be taken intraoperatively as well as adequate post-operative monitoring is recommended. In addition, treatment of existing diabetic retinopathy or maculopathy should be performed to improve visual outcome and reduce post-operative complications.

Although the frequency of post-operative complications were lower than most of the studies conducted world-wide, these results cannot be extrapolated to the general population due to smaller sample size and short follow-up, therefore we recommend better randomized studies on a larger sample size with longer follow-up.

**CONCLUSION**

The most common complication found in our study was uveitis accounting for 15.50% of the cases, followed by striate keratopathy (12.40%), posterior capsule opacification (11.62%), worse visual outcome (10.85%) and progression of diabetic retinopathy being the least common observed in only 7.75% eyes. Complications were observed more frequently in female gender and in the age group of 51-60 years. The frequency of complications was highest in patients with 10 years duration of diabetes and 15.7% of the eyes were found to have more than one complication.

**REFERENCES**

To Determine the frequency of Common Complications following Cataract Surgery


Vitreous Base Avulsion
Rona Lyn Esquejo-Leon, CRA, Travis A. Meredith, MD, & Hart B. Moss, MD,
Kittner Eye Center, University of North Carolina. USA

A 27-year-old woman presented three days after experiencing blunt trauma to her left eye during a domestic violence incident. She complained of blurred vision and a “stringy” floater in the eye. Slit-lamp examination and indirect ophthalmoscopy revealed a pigmented, ribbon like floater in the anterior vitreous, but no retinal tears, detachments or dialyses seen. Vitreous base avulsions are sometimes referred to as the “bucket-handle sign,” named for the floating opacity over the peripheral retina. They have been considered pathognomonic for blunt ocular trauma, but they have also been reported spontaneously in young patients with infero-temporal retinal dialysis and in a patient with neurofibromatosis. Although commonly associated with retinal dialysis, iris trauma or hyphema, no treatment is indicated in the absence of associated ocular pathology.
Prevalence of Refractive Errors in School going Children in Battagram (KPK), Age Group of 11-15 Years

Manzoor Hussain, B.Sc (Vision & Biological Sciences)1
Saber Mohammad FCPS2, Abdul Ghafoor FCPS3, Arshad Raza MBBS4

ABSTRACT
Objective: To determine the prevalence, the type and gender wise distribution of refractive error in school going children at the age of 11-15 years.
Material and Methods:
Study Design: This was a cross sectional descriptive study.
Setting: This study was conducted in Out Patient Department of Eye unit DHQ Hospital, Battagram of KPK.
Sample Size: Sample size was 1700 children.
Results: In our study total of 1700 children were examined, only 78(4.58%) children had refractive error with uncorrected visual acuity of < 6/12 in both eyes. In which 34(2%) were male and 44 (2.58%) were female children. Out of 78 school children, 54 (3.17%) were myopic, 13 (0.76%) were Hypermetropes and 11 (0.64%) were the cases of astigmatism. Regarding the type of refractive error, the prevalence of myopia in male was 2.36% and in female 3.97%, hypermetropia in male was 0.591% and in female was 0.94% while the astigmatism in male was 0.47% and in female was 0.82%.
Conclusions: Our study suggest that refractive error particularly Myopia is the major cause of ocular morbidity among the school going children in Distract Batagram. Provision of spectacles to rehabilitate them to normal.

Key Words: Refractive error, myopia, hypermetropia, astigmatism.

INTRODUCTION
Refractive error is the 3rd major cause of avoidable blindness. The prevalence of childhood blindness in the world is estimated as 1.5 million (0.75/1000) while in Pakistan it is 1/1000.3 The refractive error in Pakistan was 11.4% according to the national survey conducted in 1987-1990 and found that the refractive errors was the major cause of avoidable/preventable blindness. In children, causes of blindness are-corneal scarring due to vitamin A deficiency, measles, cataract, glaucoma, trauma, meningeal infections, retinopathy of prematurity and refractive errors.

Although school health services are available in developed countries but still they use community health workers and optometrist to help them to detect refractive error and refer them for visual correction. In Pakistan no such services are available. No regular screening program is known to exist in the country. The school teachers are the key person to detect refractive error in such children and refer them to hospitals. Unfortunately the literacy ratio is so low particularly in female children that majority of children are left as they are. A lot of information can be collected from parents, teachers and relatives to watch children who keep books close to their eyes, watch television or doing computer games at close distances than normal. This study was designed to detect and to determine the prevalence of refractive error and their correction in children who come to OPD of DHQ Hospital, Batagram (KPK).

MATERIALS AND METHODS
All the children coming to OPD were screened. The age group 11 to 15 years were selected for this study. Written consent was taken from all children or parents who were included in the study. Unaided visual acuity was tested in both eyes, if it was 6/12. Cycloplegic refraction was conducted if vision improved with pinhole. However, children who needed further treatment were referred and examined by the ophthalmologist. Myopia ranging from -0.5 to -8.0 diopters, Hypermetropia form +1.0 to +8.0 diopters and Astigmatism from -0.50D and more were recorded and coded. Children needed glasses were provided and performa were filled up for all the children screened.

Table 1. Prevalence of refractive error in school children

![Graph showing prevalence of refractive error in school children]
RESULTS

1700 school children in age group 11 to 15 years registered in government as well as in private schools were examined in District Batagram KPK. Among 1700 children 845 were male and 855 were female. Refractive error was detected in 78 children. Male children were 34 (2%) and female children were 44(2.58%). It reveals that the prevalence of refractive error is more in females’ school children than the male. Out of 78 school children, Myopes were 54 (3.17%), hypermetropes 13(0.76%) and astigmatism in 11 (0.64%) cases as shown in table 1. The prevalence of myopia in male students was 2.36% and in female it was 3.97%. Hypermetropia in male was 0.59% and in female was 0.93%. The astigmatism in male was 0.47% and in female it was 0.93% shown in table 2. Out of 1700 children, there were 1622 (95%) with normal vision and needed no treatment but 78(4.58%) with refractive error were prescribed glasses as shown in table 3. Total students were 1700, Total male were 845 (49.70%) and female were 855(50.29%).

DISCUSSION

Childhood visual disability is a serious public health issue. Refractive errors are the third commonest cause of blindness in Pakistan being 11.4%, after cataract 66% and corneal opacity 12.6%. Refractive errors in childhood leading to visual disability impacts on learning capability, educational potential and personality development of the child. On other hand detection, correction of refractive error is the easiest and effective way of management by involving community and optometrist.

The impact of refractive error on the individual and on the community cannot be ignored. In our study total 1700 children were screened, where 78 (4.58%) had refractive error. While study conducted in Khyber Teaching Hospital had refractive error in 12.7%. The reason for this could be that this was on large scale and with large sample size.

The prevalence of refractive error in our study population is 4.58%, which is less than the prevalence in China2 and Chile, i.e. 12.8% and 15.8% respectively. The reason for this could be that studies in China and Chile were conducted on large scale and large sample size. In our study myopia was 54 (3.17%), hypermetropia was 3 (0.76) and astigmatism was 11 (.64%). In other study the refractive error was 3.98% conducted in union council Batkhela Malakand Division. The reason for this could be that it was conducted on small sample size as compared to our study.

The prevalence of refractive error in Benin city, southern Nigeria is 3.9%, This is all because of possible reason that this study was done on 571 females of age 11 to 21years. This study was conducted on females only. An Indian study has found that refractive error were responsible for 12.5% of the blindness and 59.4 % moderate visual impairment, which is higher than the prevalence of refractive error as compared to our study. The study in Singapore and Japan showed that the prevalence of refractive errors increased with increasing literacy rate (most prevalent in medical students) In the ref error study done in La Florida Chile myopia increases with increasing age 19.4% in males and 14.7% in females by the age 15 years. In our study. The prevalence of myopia is also increased with increasing age It reveals that myopia is also associated with older age.

In other study done in Kathmandu (Nepal) showed refractive error was (4.3%). The prevalence of myopia is low as compared to this study, because it include all the children of the school visited irrespective of age. In other study conducted in Pakistan showed that astigmatism was 1.78% and also slightly more in females. In this study the astigmatism was high in females as compared to males school children. In other study conducted in Lady Reading Hospital, Peshawar Shah, study showed that hypermetropia is higher than myopia while in our study myopia is greater than hypermetropia. Study done in Katmandu showed that myopia is the commonest cause of refractive error (4.3%).

In other study conducted in Ethiopia, the prevalence of refractive errors in either eye was present in (9.4%) of children. In this study myopia was greater than hyperopia, which is similar to our study. While in study conducted by Afghani., T, in Pakistan showed that astigmatism was 1.78% and also slightly more in female. In this study the astigmatism was high in fe-
males as compared to males’ school children.

In other study conducted in China, Chile and Nepal, where both myopia and hypermetropia were significantly higher in females than males. In our study myopia is large in females as compared to males. Study conducted in school children in Karachi. 1000 children were examined, refractive error was 8.9%, being high as compared to our study.

CONCLUSION & RECOMMENDATIONS:

Our study showed that the refractive error is the major cause of ocular morbidity among the school going children in Distt. Batagram of Hazara Division. It creates a lot of problems in the growing children. So early detection and its management may improve their learning capability, educational potential and career.

There is lack of acceptable, affordable, accessible and equitable eye health care particularly optical services enabling children to make their spectacles, because most of the children are poor and cannot afford to purchase the expensive glasses. Screening of children for refractive errors should be conducted at community level and integrated into school health program accompanied by educational and awareness campaign to ensure that the corrections are used and cultural barriers to compliance are redressed and removed.

REFERENCES:

4. M. Rahil , R Nuzhat, K Umar Prevalence of Refractive errors in school going children in age group of 11-15 years ophthalmology update Vol.9 No.3 page No.26 to 29
5. Neigeria Ideh V.C.U MBBS; FMC (opt):FWACS: Oahu A.1; AMUE; Oseji A.KpanP; Dawodu. 25th international congress of the medical women’s international association visual screening of school children in Benin-city edo state.
8. Eugene, Maul, Barroso S, Munro, Roer D, Sperdut and Leon B. Refractive error study in children; result from La Florida, chile. American Journal of ophthalmology app 200;volume 129. NO4-454
ABSTRACT:
Purpose: To screen hepatitis B&C among patients undergoing ocular surgery.
Background: Both hepatitis B and C are a common example of nosocomial infections. These are blood borne infections commonly transmitted from health care settings. They are also a source of health hazard to health care professionals. Our aim was to identify the prevalence and risk factors associated with hepatitis B and C among patients with eye diseases.
Materials and Methods: This was a prospective observational study, conducted from Jan 2012 to December 2012 in Department of Ophthalmology, DHQ Teaching Hospital, Mirpur, AJK. A total of 1120 patients admitted in eye ward, were screened for hepatitis B&C by immune-chromatographic method. The patients were divided into various ocular groups based on primary diagnosis
Results: Out of total 530 patients admitted in eye ward, 289 of them were male and 241 were female. A total of 37 patients (6.98%) approximately 7% were found to be serologically positive for HCV and 15 (2.83%) were found to be serologically positive for HBV, which makes a prevalence of 6.98% and 2.83% respectively. The risk of hepatitis C was increased with advancing age.
Conclusion: Prevalence of hepatitis B &C in eye patients is quite high. Therefore, all patients, who need surgery should be routinely screened for hepatitis B & C. This is an alarming not only for patients but for health workers as well. This information should be used to highlight the need for health education and requirement of better and effective universal safety precautions to prevent the spread of HBV and HCV in our hospitals.
Key words: prevalence, hepatitis B & C, eye ward.

INTRODUCTION
Both Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are a potential threat to health care professionals, not only in Pakistan but all over the world as well. Majority of the carriers are asymptomatic but usually progress to chronic liver disease and hepatocellular carcinoma.1,2

HBV was discovered in 1963 and its serological marker, hepatitis B surface antigen (HBsAg), which is most commonly used for screening purpose, was identified by Blumberg.3,4 Approximately, there are more than 350 million HBV carriers in the world and roughly more than one million people die each year due to HBV involved liver disease.3 HCV was isolated in 1987 and infected nearly 500 million people in the world.5 Hepatitis can be transmitted through either blood or fluids (serous, saliva or vaginal secretion),6,7 but HCV is spread only by blood and blood products.8

Both these infection present with non-specific symptoms like malaise, anorexia, abdominal pain and jaundice but at times there are no symptoms, till the development of chronic liver disease with cirrhosis, portal hypertension, esophageal varices, ascities, encephalopathy or liver malignancy.9,10

Although, there is a vaccine available for hepatitis B which is now incorporated in immunization schedule worldwide, but unfortunately, once contracted, these infections poorly respond to the treatment modalities available, therefore to avoid the disease spread, strict precautionary methods are advisable.11 In ophthalmology, there are chances of exposure to HBV and HCV during out-patient (OPD) procedures like syringing, biometry, Tonometry and indoor OT procedures during administration of anaesthesia, handling of sharp instruments (Blade, side-port, needles etc) and during sterilization and exchange of instruments and finally during disposal of biomedical waste.12

Various prevalence rates of HCV have been reported both local and international ranging from 0.4% to 24%.13 A surgeon’s chances of acquiring HBV infection is from 1% to 13%. It is important that all surgeon know these HBV profiles. As vaccine is available against HBV, therefore it should be given to all those surgeons, who are partially or completely non-immunized

MATERIALS AND METHODS
This study was carried out at Department of Ophthalmology, Divisional Teaching Hospital, Mohi-ud-

4
Din Islamic Medical College, Mirpur. It is a teaching Hospital providing tertiary care ophthalmic services in AJK. All the patients admitted for eye surgery were screened for HBs antigen and Anti HCV antibodies using immune-chromatographic (ICT) method. The results were recorded on a pre-designed proforma and analyzed at the end of study. Universal surgical precautions were taken for patients who were positive for hepatitis B and C screening like hand free transfer of sharp surgical instruments and wearing double gloves.

RESULTS

Out of total 530 patient admitted in eye ward, 289 (54.52%) were male and 241 (45.47%) were females. Their ages ranged from 2 to 80 years. Out of 530 screened patients 15 (2.83%) were positive for HBS Ag and 37 (6.98%) were positive for ant HCV. Among 15 HBS Ag positive patients 9 (60%) were male and 6 (40%) were female. The gender distribution is shown in table I. Furthermore out of 37 anti HCV positive patients, 25 were male (67.56%) and 12 (32.4%) were female. Their age distribution is shown in table II.

Table I. Gender Distribution for Hepatitis B and C positive Patients.

<table>
<thead>
<tr>
<th>Total</th>
<th>HCV(%)</th>
<th>HBS(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>289</td>
<td>21(%)</td>
</tr>
<tr>
<td>Female</td>
<td>241</td>
<td>16(%)</td>
</tr>
</tbody>
</table>

Table II. Age Distribution for Hepatitis B and C positive Patients.

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of pats.</th>
<th>HCV+VE</th>
<th>HBSV+VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;20</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21-30</td>
<td>37</td>
<td>1(2.70)%</td>
<td>0</td>
</tr>
<tr>
<td>31-40</td>
<td>51</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>41-50</td>
<td>93</td>
<td>4(8.11)%</td>
<td>2(13.3)%</td>
</tr>
<tr>
<td>51-60</td>
<td>154</td>
<td>13(35.13)%</td>
<td>6(40)%</td>
</tr>
<tr>
<td>61-70</td>
<td>126</td>
<td>9(24.52)%</td>
<td>5(33.3)%</td>
</tr>
<tr>
<td>&gt;70</td>
<td>57</td>
<td>7(18.9)%</td>
<td>2(13.3)%</td>
</tr>
<tr>
<td>Total</td>
<td>530</td>
<td>37</td>
<td>15</td>
</tr>
</tbody>
</table>

DISCUSSION

Hepatitis B and HCV are among the global diseases that are endemic all over the world. In our study, the incidence of HBV infection amongst patient admitted was 7% as compared to hepatitis C which is 2.83%. Incidence of these viruses, in general Pakistani population ranges between 4-20%.16

These results of our study are comparable to study have done in different units of Pakistan. Karachi, HBV (2.1%) and HCV (11.1%)17, Rawalpindi (12.8) HBV and HCV (7.5%)18 Kharian 2.35% for HBV and 6.3% for HCV19 and Khanpur HBV 2.33% and HCV 18.33%.20 Two studies had been carried out in Japan, one shows HBV (1.8%) and HCV (7.1%) and HCV (16.9%).21,22 Similarly, in another study done in ocular patients in Nigeria, incidence of HBV was 1.7%,23 which resemble our study, like wise in southern China prevalence of HBV remained 9.7% whereas that of HCV was 0.99%.24

Considering the gender, an increased prevalence is observed in males in all the above mentioned studies, whether national or international. A Pakistani study has mentioned that males have more freedom and mobility as compared to females.15

Highest age specific prevalence in our study was between 51-70 years of age. This phenomenon can be partly attributed to the fact cataract formation is most commonly observed in this age group. This fact is also unanimously observed in above mentioned studies.

Although a number of factors may lead to transmission of HBV and HCV but contaminated syringes and blood products that are not properly screened are major risk factors.25 It is reported that contaminated syringes and infected surgical instruments can transmit this infection even a month after being in contact with the virus.26 In a study from USA, parenteral drug use was reported to be the major risk factor in majority of HCV positive cases.27

Screening for hepatitis B & C is not routinely carried out in most of the public health settings as well as government hospitals, because of lack of awareness, inadequate health education, non-availability of test facilities and high cost of screening tests. Due to heavy surgical work load, operation theatres can be the source of transmission of HBV and HCV. Operation theatre staff should be properly screened for HBV and HCV so that any infected personnel should take special precautionary measures.28 Routine serological screening prior to surgery should be made mandatory so that asymptomatic patients would no longer pose a threat to its spread.

Isolation of hepatitis B&C virus from tear fluids and aqueous humor raises a serious concern of transfer of hepatitis C virus, during the course of an ophthalmological examination, that is during Goldman Tonometry and trial contact lens fitting.29 Certain studies have discovered that the concentration of hepatitis C virus in human tear fluid is independent of the severity of hepatitis infection.30 Other studies have reported that hepatitis C virus RNA is found in higher concentration in tear fluid compared with plasma.31

It has also been found that splashing blood or other body fluids from patient who are HCV positive, in to the face and eyes of a healthy person is a risk factor of hepatitis C virus transmission.32 The high incidence of hepatitis B and HCV in Pakistan is alarming and peri-operative screening is highly recommended as...
early screening would not only allow timely initiation of therapy as well as decreased rate of mortality and morbidity. Surgery can be then carried out with special precautionary measures so as to limit the spread of these deadly diseases.

CONCLUSION

After observing a high prevalence of hepatitis B&C in ophthalmic patients, we recommend routine screening of all patients before surgery. Hepatitis C should be even of more concern to public health authorities. Screening should be a part of preventive measures and it should be implemented and monitored to control disease transmission. Public health education and awareness should be done through electronic and print media.

REFERENCES

17. Chaudhry IA, Khan SS,Majrooh MA, Alvi AA. Seroprevalence of Hepatitis B and C among the patients reporting at surgical OPD at Fauji Foundation Hospital, Rawalpindi. Pak Journ med Sci 2007;23 (4):514-17
Comparison of Surgically Induced Astigmatism after Phacoemulsification Vs Extra Capsular Cataract Extraction

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ABSTRACT
Purpose of study: To compare the results of surgically induced astigmatism (SIA) in patients who underwent Phacoemulsification and extra capsular cataract extraction with posterior chamber intraocular lens implant.

Setting: Isra Postgraduate Institute of Ophthalmology, Karachi

Methods: This prospective study comprised of 200 patient, 100 eyes (100 patients) underwent phacoemulsification through clear corneal 3.2 mm incision with foldable IOL implantation, while in 100 eyes (100 patients) ECCE with a superior corneal section 8.00 to 10.00 mm in size was performed with 6.5 mm optic size posterior chamber PMMA IOL implantation. Automated keratometery was performed preoperatively and post operatively on 1st day, 2nd week, 6th week and 12th week. Surgically induced astigmatism was calculated with computer based software SIA calculator version 2.1 The software utilized the Cartesian co-ordinates based method as suggested by Dr. Holladay.

Results: The mean SIA was 0.74 D x 171 for patients undergoing conventional ECCE Surgery and 0.42 D x 43 for patients having Phacoemulsification Surgery (p <0.001) at three month of follow up.

Conclusion: Phacoemulsification with intraocular lens implantation results in lower SIA than ECCE surgery and faster visual rehabilitation than conventional extracapsular cataract extraction.

Key Words: Phacoemulsification, Extracapsular cataract extraction, Surgically induced Astigmatism (SIA)

INTRODUCTION

Cataract extraction constitutes the largest surgical workload in ophthalmic units throughout the world. Extra capsular cataract extraction (ECCE) is still the most widely used method. The basic advantage of phacoemulsification over the conventional ECCE is that it involves a very small incision compared to 8.00mm-10.00 mm of (ECCE).1,2

A significant improvement in results due to reduction in SIA was observed in the early nineties with the transition from planned extra capsular cataract extraction to phacoemulsification. The major reason for the transition was the good control of low post-operative astigmatism after phacoemulsification and there was a need for an effort to control astigmatism in the relevant method for assessment of SIA.3 Surgical procedure, the cataract surgeon must know as much as possible about the source of the astigmatism. Basic astigmatism of eye is predominantly due to corneal and lenticular astigmatism,4 whereas any procedure that alters the patient’s inherent astigmatism causes SIA.

Surgically induced astigmatism (SIA) is the one of the most important complications of cataract surgery.5 The postoperative astigmatism delays visual rehabilitation and limits the final visual outcome.5 Phacoemulsification (PHACO) reduces the post-operative astigmatism and gives faster visual rehabilitation of patients when compared with conventional extra-capsular cataract extraction(ECCE).6,7 Analysis of astigmatic data presents a complex problem both the magnitude and the direction need to be assessed simultaneously. This problem is resolved by converting the astigmatic data into a Cartesian coordinates system, where each astigmatic vector is assigned a position represented by(x, y) values for use in statistical analysis. These data were also displayed and analyzed using double angle plots(DAP) as depicted in (figures).

A highly localized clustering of points on the DAP indicated a homogenous group with true representative of its centroid with a high predicative value. Analysis of SIA allows the surgeon to evaluate his own technique and also to maximize his potential for obtaining a consistently good surgical outcome. It further allows the surgeon to choose the right axis, right length, right site and right nature of incision over a pe-
Comparison of Surgically Induced Astigmatism after Phacoemulsification

period of time. This is especially important while planning for correction of preexisting corneal astigmatism during any type of cataract surgery. This study was carried out with two objectives:

1. to assess whether or not PHACO actually yielded less surgically induced astigmatism (SIA) than ECCE and
2. to evaluate astigmatism by using clinically relevant methods.

**MATERIALS & METHODS**

This study was carried out at Department of Ophthalmology Isra Post-graduate Institute of Ophthalmology, Karachi.

**Duration of Study:** nine months (January 2011 to September 2011)

**Sample Size:** 200 patients (100 in PHACO-group and 100 in ECCE-group)

They were subdivided randomly into two groups of 100 eyes each. Group A received Extracapsular cataract extraction, group B received cataract extraction through Phacoemulsification surgery.

**Sampling Technique:** non-probability randomized.

**Inclusion Criteria:** senile cataract age above 40 years.

**Exclusion Criteria:** Those patients with complicated
Comparison of Surgically Induced Astigmatism after Phacoemulsification

and traumatic cataract, previous refractive surgery, Corneal disease (corneal opacity scar or adherent leukoma), pterygium, filtering blebs were excluded from the study.

**Pre-operative examination:** Complete ocular examination including visual acuity aided and unaided, intraocular pressure measurement, fundus examination, keratometry and A-scan biometry was done along with general and systemic examination. A written consent was taken by every patient prior to surgery. All surgeries were performed under local anaesthesia.

**Surgical Technique:** 100 eyes (100 patients) underwent phacoemulsification through clear cornea 3.2 mm incision with foldable IOL implantation, while 100 eyes (100 patients) had ECCE with a corneal section 8.00 to 10.00mm in size superiorly, 6.5 mm posterior chamber PMMA IOL was implanted.

**Postoperative follow-up:** Patients were assessed postoperatively on 1st day after surgery, 2nd week, 6th week and 12th week. Final recovery was assessed at 12 week after surgery. At each follow-up visit, patients were assessed under following parameters:

1. Visual acuity
2. Slit lamp examination
3. Refraction status assessed at 6 weeks.
4. Automated keratometry (AUTO-REF Kerato System(Rektio ORK-11))
5. Fundoscopy 6. Measurement of intraocular pressure

**Recording of Astigmatism:** The corneal astigmatism was measured preoperatively and on subsequent follow-up postoperative visits by means of an automated keratometer. All data were stored and analyzed by means of a computer data base.

**Analysis of Data:** Surgically induced astigmatism was calculated with computer based software SIA calculator version 2.1 pre and the postoperative keratometric values were calculated for evaluating surgically induced astigmatism as suggested by Holladay et al., The software utilized the Cartesian co-ordinates based method.

**RESULTS**

We found that the surgically induced corneal astigmatism was considerably lighter after PHACO than after ECCE up to at least 12th week after the operation. Moreover, shortly after the operation (i.e., up to at least 6 weeks postoperatively) corneal astigmatism was, on average, with-the-rule.

The magnitude of preoperative astigmatism was higher in group B 0.66 ± 0.53 than in group A 0.59 ± 0.63 [Table - 1]. The magnitude of postoperative astigmatism [Table - 1] was higher in group B (1.43 ± 0.83) than in group A (1.06 ± 0.58). The magnitude of surgically induced astigmatism [Table - 1] was also higher in group B

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<th>Table 1: Magnitude of astigmatism</th>
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<tr>
<td>Magnitude of astigmatism</td>
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<tr>
<td>Mean Preoperative magnitude</td>
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<tr>
<td>Mean postoperative magnitude</td>
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<tr>
<td>Mean SIA magnitude</td>
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(1.41 ± 0.84) than in group A (1.01 ± 0.54).

Table-1 shows Magnitude of astigmatism.

Analysis of the SIA centroids [Table – 2] shows that 0.74 of horizontal steepening (or vertical flattening) was induced by making a superior incision. Surgically induced astigmatism in the Phaco group was 0.42 D at 43° which shows 0.42 D of flattening at the site of clear cornea incision and the axis orthogonal to it is steepened (actually shows 0.21 D of flattening at the incision and 0.21 D of steepening orthogonal for a total of 0.42 D).

<table>
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<th>Table 2: Centroids</th>
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<tr>
<td>Centroids Holladay</td>
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<tr>
<td>Mean Preoperative centroid</td>
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<tr>
<td>Mean postoperative centroid</td>
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<tr>
<td>Mean SIA centroid</td>
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It is evident that more astigmatism is being induced by ECCE than PHACO. Both sets of data have a reasonable level of coherence (measure of spread of vector) for SIA, and more importantly, the coherence percentage for SIA is almost equal. This means that the data can be compared directly, since the amount of vector spread is similar and any effects of vector cancellation on the centroid (mean SIA vector) are equivalent for both groups.

The SIA vector in ECCE group on the Double Angle Plot (figure 3) shows clustering, employing high predicitave value of the centroid obtained, that is 0.74 x 170 this indicate that making a superior incision consistenly induced an average of 0.74 steepening. The SIA vector in PHACO group are also well clustered employing a high predicitave value and incision induced a flattening of about 0.42 @ 43. The results are summarized in Fig. 1, with respect to the magnitude of the induced corneal astigmatism regardless of the axis.

![Fig: 1](image-url)
It is evident that the change in magnitude of the corneal astigmatism was markedly smaller after PHACO than after ECCE during the entire follow-up period. This difference is statistically significant. The final induced post-operative astigmatism was significantly less between the groups at 0.42 D x 43 for patients undergoing phacoemulsification surgery and 0.74 D x 171 for patients having conventional ECCE Surgery (p <0.001, paired Student t-test).

**Fig : 2**

**Induced Astigmatism After Cataract Surgery Comparing 2 Groups**

<table>
<thead>
<tr>
<th>0.42</th>
<th>0.74</th>
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<tr>
<td>PHACO</td>
<td>ECCE</td>
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**DISCUSSION**

It has been demonstrated in this study that the surgically induced corneal astigmatism following cataract surgery is considerably slighter after phacoemulsification than conventional extracapsular cataract extraction during at least the first six weeks postoperatively. Phacoemulsification as compared to ECCE, with respect to surgically induced corneal astigmatism, yielding earlier visual rehabilitation of the patient.

Naseer Raja and M. Khizer Niazi reported in their study that the mean postoperative astigmatism in ECCE group was +2.25 (±0.49) D in time, by about 0.3 D per year. Wang L et al. indicated long-term wound remodeling that may affect SIA. Long term data is required to analyses changes by the procedure. However, if against-the-rule astigmatism indeed becomes larger with time, this might, in future, prompt us to adjust our surgical techniques.

**REFERENCES**

11. Dam-Johansen M, Olsen. Refractive results after phacoemulsification and ECCE; reported the mean surgically induced astigmatism to be 0.91D in the phacoemulsification and 1.36 D in ECCE group. He concluded that phacoemulsification improves the surgical control of refractive outcome of cataract surgery. These results are very near to those which are obtained during this study. Another study by Watson A. and Sunder Raj P. had reported similar results that less astigmatism was induced by phacoemulsification than ECCE.11
12. Talamo et al. had made similar observations in patients who had undergone ECCE. Their follow-up period ranged from 6 to 48 months. Interestingly, their data suggested that the against-the-rule astigmatism grew larger in time, by about 0.3 D per year. Wang L et al. indicated long-term wound remodeling that may affect SIA. Long term data is required to analyses changes by the procedure. However, if against-the-rule astigmatism indeed becomes larger with time, this might, in future, prompt us to adjust our surgical techniques.

**CONCLUSION**

The results obtained during this study significantly indicate that Phacoemulsification with intraocular lens implantation results in lower induced corneal astigmatism following surgery and shorter post-operative recovery than conventional extracapsular cataract extraction. The basic advantage of this method over the conventional ECCE is that it involves a very small incision. This small incision results in faster wound healing without suturing.
INTRODUCTION

Oculocardiac reflex or Aschner’s reflex was first recognized in 1908. Studies establishing this reflex as a complication of ocular surgery have been documented in the west but no such study has been conducted in our province, which is necessary to confirm any variation of its incidence with respect to environmental and racial factors.

Dysrhythmia is a change in the normal physiological rhythm of the heart so the Oculocardiac reflex is defined as occurrence of dysrhythmia when pressure is applied on the eye ball or extraocular muscles specially medial rectus muscle. Inhalational anesthetic agents make the heart vulnerable to increased vagal tone especially in the young. Oculocardiac reflex is mediated via trigeminal-vagal reflex arc. The afferent division of the arc is ophthalmic branch of trigeminal nerve and the efferent division is vagus nerve. This reflex is predominantly seen in pediatric patients but is not uncommon in adults either. This reflex is stimulated in a variety of ocular surgeries like strabismus, cataract, enucleation and retinal detachment. It has been observed that patients with gray and blue irises are less prone to this reflex than patients having brown and hazel coloured irises. Dysrhythmias are elicited by applying pressure on the extra ocular muscles or eyeball. They may be in the form of nodal rhythm, premature ventricular beats, bradycardia, ventricular fibrillation or cardiac arrest.

Oculocardiac reflex can also develop in conscious patients under local anesthesia. In these patients in addition to dysrhythmias nausea, vomiting and somnolence is experienced. It is observed more commonly in anesthetized patients and in ninety percent of children not receiving prophylaxis for its prevention.

MATERIAL AND METHODS

This randomized control study was performed in the eye operation theatre by the Ophthalmology Department with collaboration of Anesthesiology Department of Khyber Teaching Hospital, Peshawar. Study duration was from February, 2011 to October, 2011. Convenient sampling was applied in this study. The sample included a total of 80 patients divided into two groups, A and B. Group A patients were administered Atropine, while the Group B patients were not administered Atropine. Inclusion Criteria was age 10-15 years, patients with ASA class I and II (American Society of Anesthesiology), all patients undergoing strabismus surgery. While exclusion Criteria included patients who were having glaucoma, tachycardia, fever and dysrhythmia. Preoperative assessment and informed consent was taken from the patients.
Heart rate, blood pressure, heart rhythm and respiratory rate were monitored throughout the surgery. Any change in these variables due to oculocardiac reflex was documented on a standard proforma. Bradycardia was defined as a heart rate of 60 or less than 60 beats per minute. Patients in group A were administered Atropine Sulphate in a dose of 0.02 mgs/kg body weight, just before the induction of anesthesia while no Atropine was given to patients belonging to group B. Patients in both groups were induced with intravenous Propofol in a dose of 2 mgs/kg body weight and a non-depolarizing muscle relaxant atracurium in a dose of 0.5 mgs/kg body weight. After endotracheal intubation anesthesia was maintained with oxygen and isoflurane. Tramadol 1 mg/kg was used as an analgesic. Data analysis was done using IBM SPSS version 2.0. Graphs were made using Microsoft excel 2010.

RESULTS

Oculocardiac reflex occurred in both the groups but the percentage was higher in group B (non-medicated), shown in figure 1. The types of Dysrhythmias that occurred and there frequency is shown in figure 2. In both the groups heart rate did not decrease more than 35 beats per minute. Mild decrease in Blood pressure was observed in patients of group B during the reflex. Data was considered significant with a p value of <0.05 calculated by applying chi square test.

DISCUSSION

Oculocardiac reflex describes that the pressure and traction applied on the eyeball can produce a variety of cardiac dysrhythmias which includes sinus bradycardia, ventricular ectopic beats, ventricular fibrillation and even sinus arrest by activation of vagal nerve fibers in the sinus node. The more aggressive the manipulation of extra ocular muscle the higher the chances of oculocardiac reflex. Anticholinergic medication like atropine and glycopyrolate are helpful in preventing this reflex. Intravenous Atropine or glycopyrolate when given just prior to surgery are more effective than when given intramuscular. Atropine sulphate is one of the anticholinergic drugs, it blocks muscarinic acetylcholine receptors in clinical doses and produces its effects in accordance with the distribution of muscarinic receptors in different organs. Blockage of muscarinic receptors in the sino-atrial node leads to tachycardia. This effect is especially important in reversing the bradycardia associated with vagal reflexes like baroreceptor reflex, peritoneal stimulation or oculocardiac reflex. The use of anticholinergic medicines may be hazardous in some patients like patients with tachycardia, hyperthyroidism, angle closure glaucoma.

In our study we found that incident of dysrhythmias in group A was 5%. In group B the incident was 65%. In group A only bradycardia was detected and there was no change in the blood pressure of the patients. While in group B significant dysrhythmias were noted with mild fall in blood pressure. Luckily serious dysrhythmias like ventricular fibrillation or cardiac arrest were not detected. In group B two types of dysrhythmias were noted bradycardia and ventricular ectopic beats, patients were not allowed to be in a state of dysrhythmia for a longer period of time even bradycardia was treated immediately that is why we did not observed any serious dysrhythmia.

The incidence of dysrhythmia was quite high in the past due to advanced monitoring, safe anesthetic agents and in time detection, the incidence of morbidity and mortality associated with this reflex has decreased. Moreover the routine use of an anticholinergic drug like Atropine sulphate as pre-medication in ocular surgery has also decreased the incidence of oculocardiac reflex.
The occurrence of dysrhythmias is not limited to strabismus surgeries alone, study done by Yang shows that intra ocular foreign bodies can also elicit this reflex. Likewise diseases of the choroid can also produce the oculocardiac reflex.

In terms of general anesthesia as being an important risk factor of this reflex, study done by Grover and Bhardwaj showed that local anesthesia produces less bradycardia and ectopic arrhythmias and accordingly they have urged the use of local anesthesia over general anesthesia in surgeries involving extra ocular muscle manipulation. Karhunen compared atropine and glycopyrrolate effectiveness in preventing dysrhythmias and he found atropine to be more efficacious as a first line choice of pre-medication for strabismus surgery. Bosomworth emphasizes the need of continuous monitoring of the cardiac rate and rhythm of the patient undergoing eye muscle surgery. According to Buchwald and Victor, general anesthesia is the single most important cause of all types of dysrhythmias that have been reported to occur in oculocardiac reflex. According to a study published by Sing and Roy ketamine when used as a topical anesthetist in rabbits, effectively prevented the occurrence of oculocardiac reflex. On the other hand study done by Baek and Park showed that oculocardiac reflex can occur during endoscopic sinus surgery and is not limited to Ocular surgeries only. And a case reported by Mezitis showed that oculocardiac reflex can follow insertion of a bilateral nasal balloon catheter for controlling bleeding following head trauma.

CONCLUSION

Pre-medication are extremely important in preventing oculocardiac reflex in patients undergoing general anesthesia. Proper intra operative monitoring is mandatory in all the patients during surgery.

REFERENCES

Comparison of Effects on Corneal Endothelium of A Low Cost & Expensive Combination of Viscoelastic Material & Irrigating Solution in Phacoemulsification

Muhammad Rafiq FCPS¹, Imran Ahmad MBBS², Habib Ullah MBBS³

ABSTRACT
Purpose: To see the protective effect on corneal endothelium of a cheap and an expensive combination of a dispersive viscoelastic material and an irrigating solution in phacoemulsification.

Setting: Department of Ophthalmology, Rehman Medical Institute, Peshawar.

Methods: In this prospective randomized study, we selected 90 eyes of 45 consecutive patients with senile cataracts bilaterally. The first eye of each patient randomly received hydroxypropyl-methylcellulose 2% and Ringer’s solution (low-cost combination) or sodium chondroitin sulfate 4%–sodium hyaluronate 3% and an enriched balanced salt solution (BSS Plus®) (expensive combination) during phacoemulsification. While the contralateral eye received the other treatment. Endothelial cell function was evaluated by measuring corneal thickness (CT) using pachymetry and endothelial cell counts by specular microscope.

Results: Postoperative increase in CT was +9.5µm in the low-cost group and +10.3µm in the expensive group; the difference between groups was insignificant. After 1 month, the CT still differed significantly from the baseline in the low-cost group while in the expensive group, recovery was good. Three months after surgery, the CT had returned to baseline values in both groups and at this stage, there was no significant difference between the groups.

Conclusions: During phacoemulsification in a non-selected patient population, there was no difference in acute postoperative corneal edema and endothelial cell counts at 3 months between an expensive and a low cost combination. Eyes which received the expensive combination had faster recovery of corneal swelling at 1 month. However, the cost of expensive combination is 6-7 times that of low-cost combination.

INTRODUCTION
The endothelium is a monolayer of cells on the posterior aspect of cornea having no ability for regeneration after injury. The active fluid pump present in the endothelium keeps the cornea transparent and in a relatively dehydrated state.¹,² The natural loss of human endothelial cells is approximately 0.5% each year.³ Any type of intraocular manipulation such as phacoemulsification, causes fluid and lens fragment turbulence leading to endothelial cell damage.⁴,⁵

Solutions initially used for cataract surgery were salt solution, Ringer’s solution and plasma-lyte 148. Subsequently, in 1960, more physiological solutions with ionic composition, pH and osmolality similar to aqueous humour were developed and received the name of balanced salt solution (BSS).⁹ In 1973, a third generation of irrigation solution, named BSS Plus, was developed after studies by Edelhauser and coauthors,¹⁰,¹¹ who verified that the addition of glutathione, glucose and bicarbonate to the irrigation solution would contribute to endothelial cell function and survival in vitro.

Viscoelastic materials have assumed an important role in cataract surgery since the introduction of sodium hyaluronate in early 1970s. New viscoelastic materials have emerged in order to improve corneal endothelial protection during cataract surgery. There are 2 main types of viscoelastic materials for enhanced protection of the corneal endothelium: (1) high-viscosity, cohesive materials (e.g., sodium hyaluronate), and (2) low-viscosity, dispersive materials (e.g., sodium chondroitin sulfate 4%–sodium hyaluronate 3% such as Viscoat and hydroxypropyl methylcellulose 2% such as Eyefill), which adhere to the corneal endothelium, providing a protective layer. Such materials are often used in patients with a low preoperative endothelial cell count.

We compared the endothelial protective effect during phacoemulsification of a low-cost combination of a viscoelastic material and an irrigating solution, Eyefill and Ringer’s solution, with a more expensive combination of Viscoat and BSS Plus, which costs approximately 6-7 times more. We analyzed their effect on corneal thickness (CT) and corneal endothelial cell count during phacoemulsification.

MATERIAL AND METHODS
This prospective randomized study comprised 90 eyes of 45 consecutive patients with bilateral age-related cataracts who underwent phacoemulsification. The median age of the patients was 62 years (range 50 to 68 years). First eye of each patient was randomly assigned to low-cost group or expensive group. The contralateral eye received the alternative treatment. Central corneal thickness was measured with corneal pachymeter preoperatively and at day 1, day 7, and day 30 and day 90 postoperatively. Ten measurements per eye were obtained at each observation with the examiner masked.

Received & Accepted: December 2014
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to the combination used.

Corneal endothelium was examined with a specular microscope preoperatively and 3 months after surgery. Three endothelial cell photographs were taken per eye at each examination. The mean of the 3 photographs was calculated. In all cases, the ultrasound time (seconds) and amount of irrigating solution used (milliliters) during surgery were also noted.

All patients were operated by the same surgeon. Pupils were dilated with phenylephrine 2.5%, tropicamide 0.5%. Anesthesia used was peribulbar. A temporal 3.5 mm limbal incision was created. The assigned viscoelastic material was then instilled before capsulorhexis was done. Hydro-dissection was done. Phacoemulsification of the nucleus was carried out with an Oertli unit. Cortical matter was aspirated. Ringer’s solution or BSS Plus, depending on the randomization, was used for irrigation.

The capsular bag was expanded with the assigned viscoelastic material, and a foldable single piece acrylic IOL was implanted in the capsular bag. The viscoelastic material was aspirated thoroughly from the anterior chamber and behind the IOL with an irrigation/aspiration (I/A) tip.

The incision was left sutureless. Decadron injection was given subconjunctivally and eye was patched with polyfax eye ointment. After 24 hours of surgery, patch was removed and patient started on diclofenac tablets and steroid and antibiotic eye drops.

**RESULTS**

Central corneal thickness and endothelial cell counts were done preoperatively and postoperatively at day 1, day 7, day 30 and day 90. The mean phacoemulsification time was 18 seconds ± 12 (SD) in the low cost group and 16 seconds ± 9 in the expensive group. Corneal thickness was found to be more in low cost group as compared to the two combinations at 3 months postoperatively. But ultimately at 03 months, there was no significant difference between the two groups in terms of corneal thickness and endothelial cell counts. (Table 1)

**DISCUSSION**

Phacoemulsification time was equal between the groups and irrigation volume was only slightly higher in the low-cost group in our study. Corneal thickness, though increased acutely in the immediate postoperative period, it steadily decreased reaching to baseline level in 01 month in the expensive combination group and in 03 months in low cost group. In the same way, endothelial cell loss was not significantly different between the two combinations at 03 months postoperatively.

Corneal pachymetry, by measuring corneal thickness, indicates the amount of trauma induced to the endothelial cells during surgery. Other authors have also reported an acute reversible increase in central CT as was found in our study. With the development of viscoelastic materials, different observations about their protection provided to the endothelium have been made. Compared to Healon (sodium hyaluronate 1%), Viscoat, a dispersive (adhesive) viscoelastic material, coats the corneal endothelium more readily and tends to remain in the eye intraoperatively. Therefore, it has been suggested that Viscoat offers greater endothelial protection during phacoemulsification. A difference in acute corneal swelling has been observed between Viscoat and Healon GV (sodium hyaluronate 1.4%) and Ocucoat and Healon. Ravalico et al. found a significant difference in change in CT between Viscoat and hydroxypropyl methylcellulose 2%. Most investigators could not find any difference between viscoelastic materials over long term. Corneal endothelial cell loss has been reported to be 1.4% for hydroxypropylmethylcellulose (Eyefill) and 0.3% for Viscoat after 3 months, similar to our results. Contradictory reports of changes in endothelial cell counts with different viscoelastic materials have been published. Lane et al. got similar results for endothelial cell loss in eyes receiving Healon, Viscoat, and Ocucoat. However, Glasser and coauthors observed that endothelial cell loss was less in eyes who were treated with Viscoat and Ocucoat as compared to Healon, which was confirmed by Monson et al. In contrast, Ravalico et al. found greater endothelial permeability and a more active pump after 30 days with hydroxypropylmethylcellulose 2% than with Viscoat. In our study, we observed no significant differences in endothelial cell density between the two groups. In contrast to the studies mentioned, our study used a randomized “bilateral” study design with intra-individual comparison between eyes.

We observed no correlation in either group between corneal endothelial cell loss and CT in contrast

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<td>$CT$ (µm)</td>
<td>$CT$ (%)</td>
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<tr>
<td>Preop</td>
<td>525±28.0</td>
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<tr>
<td>Postop 1 day</td>
<td>+9.5±11</td>
<td>+1.7</td>
</tr>
<tr>
<td>Postop 1 wk</td>
<td>+8.2±10.8</td>
<td>+1.3</td>
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<tr>
<td>Postop 1 month</td>
<td>+4±6.9</td>
<td>+0.7</td>
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<tr>
<td>Postop 3 months</td>
<td>+1.3±4.8</td>
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to previous studies. In studies of irrigating solutions used during phacoemulsification, BSS Plus caused significantly less corneal swelling on the first postoperative day than citrate–acetate bicarbonate solution or Ringer’s solution. A study of corneal endothelial cell size preoperatively and 2 months after ECCE and IOL implantation showed a non-statistically significant trend in favor of BSS Plus over dextrose bicarbonate lactated Ringer’s solution. Araie suggests that BSS Plus and glutathione bicarbonate Ringer’s solution are less toxic to the endothelial barrier function than a citrate–acetate bicarbonate solution.

Our study indicates that different combinations of viscoelastic materials with Ringer’s solution or BSS Plus do not cause significant differences in the acute change in CT and only a slight change in the recovery of corneal swelling resulting from a marginally higher change from baseline to 3 months postoperatively in the Ringer’s solution and Eyefill group. No difference in endothelial cell size preoperatively and 2 months after ECCE and IOL implantation showed a non-statistically significant trend in favor of BSS Plus over dextrose bicarbonate lactated Ringer’s solution.

CONCLUSION

More expensive combination of viscoat and BSS plus might be slightly more effective in helping the eye recover from corneal stress. The low-cost combination, Eyefill and Ringer’s solution, was similar to the more expensive combination with regard to acute corneal swelling and changes in corneal endothelial cell count during small-incision cataract surgery with foldable IOL implantation in patients with normal endothelial cell counts.

REFERENCES

Comparison of Astigmatism in two Incision Sites in Manual Small Incision Cataract Surgery

Afzal Qadir FCPS¹, Irfanullah Shah MBBS², Mahooz³, Lal Mohammad⁴
Muhammad Kashif Kamran⁵

ABSTRACT
Objective: To determine the frequency of common complications after manual small incision cataract surgery.

Materials and Methods: Descriptive cross sectional study was conducted at the Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Peshawar from 2nd April 2009 till 30 April 2010. All 106 patients were included in this study. Corneal astigmatism was measured by Helm Holtz keratometer (Topcon OM-4) (k-values were taken in diopter). All surgeries were performed under peribulbar anesthesia. An 8mm & Scleral incision was applied in both the groups, 1.5 mm away from the limbus; incision was made centered at 12 o’clock position in superior incision group and centered at 3 o’clock or 9 o’clock position in left and right eye respectively in temporal incision group. Corneal astigmatism was measured pre operatively then at 1st post-operative day, at 2 week then at 6 weeks in both groups using same keratometer. Using preop and 6 weeks keratometric astigmatism readings, SIA was calculated by subtraction method. Axis of astigmatism was determined by comparing K readings in diopters. K1 > K2 means with-the-rule astigmatism, K2 > K1 means against-the-rule astigmatism, while K1 = K2 means neutral astigmatism.

Results: One hundred and six eyes of 106 patients above 50 years of age were included in this study, 53 patients in superior incision group and 53 pts in temporal incision group. 41.5% patients were in age range 50-55yrs and 58 (54.7%) patients entering the study were male. Keratometries were performed on all patients preoperatively at 1st post-op day, at 2 weeks and at 6 weeks. Mean SIA at 6 weeks post-op was 0.367 ± 0.669 D in superior incision group and 0.225 ± 0.529 D in temporal incision group, difference in both groups was statistically insignificant (p = 0.257). Both incision sites significantly changed the axis of astigmatism at 6 weeks in relation to preop astigmatism (p = 0.005 for superior incision group) and (p = 0.021 for temporal incision group). Mean Astigmatism in both the groups at 6 weeks was found to be similar in magnitude, 0.892 D in superior incision group vs. 0.894 D in temporal incision group.

Conclusion: Both incisions resulted in same amount of mean astigmatism at 6 weeks and difference in mean SIA was found to be statistically insignificant. Temporal incision had the trend of inducing with-the-rule astigmatism.

Key Words: Astigmatism; Surgically Induced Astigmatism; Manual Small Incision Cataract Surgery, Extra capsular cataract extraction; Cataract visual-outcome; Keratometry

INTRODUCTION

Cataract is the main cause of avoidable blindness worldwide, with the developing world harboring three quarters of blindness. Despite the 10 to 12 million cataract operations performed globally, cataract blindness is still thought to be increasing by 1–2 million/year.¹ In Pakistan current all-age blindness prevalence estimate is 0.9% (95% CI, 0.8%–1.0%) according to Pakistan National Blindness and Visual Impairment Survey.²

The goal of cataract surgery is to restore the best possible uncorrected visual acuity, and minimum post-operative astigmatism.³ Surgically induced astigmatism (SIA) is still a common obstacle for achieving excellent uncorrected visual acuity.⁴ SIA is related to the incision length, incision location, incision architecture, and surgery closure technique.⁵ Many authors have reported that the opening in the clear temporal cornea causes less SIA versus superior incision, and result in less SIA due to the greater distance from corneal apex.⁴ Adopting temporal incision is not difficult for bimanual surgeon, and is best approached by surgeon due to limitation superiorly by orbital margin and it also obviates need for bridal suture due to good exposure of surgical site.⁶ In a study conducted in India, it was reported that mean surgically induced astigmatism was high in superior incision group (1.36±1.03) than temporal group (0.40±0.40).⁷

It is generally noticed that the incidence of postoperative astigmatism is more when cataract extraction is done through the corneal incision and the more anterior the incision, the greater the induced astigmatism.⁸ Conventional extracapsular cataract surgery (ECCE), Manual small incision cataract surgery (MSICS), and phacoemulsification are the three popular forms of cataract surgery in Pakistan. In more affluent areas of the world, phacoemulsification has become the preferred and popular method of performing extracapsular cataract surgery. There are, however, many regions, possibly harbouring the major load of cataract blindness in the world today, where phacoemulsification is not

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Received: Oct’2013  Accepted: Dec’2013
cost effective. This is because of the density of cataracts involved, the cost and maintenance demands of the equipment.

Nowadays there is a growing trend in developing countries towards sutureless surgery especially MSICS. Manual small incision cataract surgery is a surgical technique where cataract is removed through a small incision without the use of expensive consumables and equipment. This technique involves designing three step sclerocorneal tunnel, capsulotomy, hydrodissection and nucleus extraction. Unfortunately limited data exists in our region regarding SIA caused by site of incision in MSICS cataract surgery and to our knowledge is almost nonexistent nationally. As MSICS is an alternative technique to phacoemulsification in developing countries so more insight is needed, therefore this study was designed to see the effect of incision site on postoperative astigmatism in MSICS.

MATERIALS AND METHODS

Descriptive cross sectional study was conducted at the Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad medical complex, Peshawar. The study was conducted from 2nd April 2009 till 30 April 2010. 106 eyes of 106 patients, 53 in each group Simple random sampling was used to assign patients to the treatment groups.

Inclusion criteria: Primary age related cataract in patients 50 yrs or above. Cataract was diagnosed on slit lamp examination by presence of lens opacity which was dense enough to visually impair the patient compromising his daily living activities and which could not be corrected by retinoscopy. Preoperative keratometric astigmatism of 1.5D or less. Exclusion criteria eyes with corneal opacities, anterior synechiae, pterygium, corneal degenerations or dystrophies were excluded from our study on slit lamp examination. Eyes with history of any previous surgery or with complications during surgery like (vitreous loss or iris prolapse) were excluded. Cases in which suture had to be applied to during surgery like (vitreous loss or iris prolapse) were excluded. Patients were selected through out-patient department (OPD) after taking informed written consent. Personal bio data was taken on predesigned proforma. Corneal astigmatism was measured by Helm Holtz keratometer (Topcon OM-4) (k values were taken in diop). First patient was randomly allocated to a group by lottery method and subsequent patients were alternatively assigned to interventional groups by systematic sampling. Patients were divided into two groups; Superior incision group and temporal incision group.

All the patients were operated by a single experienced surgeon using manual small incision cataract surgery technique. Incision site was determined according to group being operated. All surgeries were performed under peribulbar anaesthesia. A 8 mm scleral incision was applied in both the groups, 1.5 mm away from the limbus. Incision was made centered at 12 o’clock position in superior incision group and centered at 3 o’clock or 9 o’clock position in left and right eye respectively in temporal incision group. Corneal astigmatism was measured pre operatively then at 1st post-operative day, at 2 weeks then at 6 weeks in both groups using same keratometer by myself.

RESULTS

One hundred and six eyes of 106 patients above 50 years of age diagnosed as having age related cataract and fulfilling the inclusion criteria were included in this study. Fifty three eyes (100%) in superior incision group and 53 eyes (100%) in temporal incision group completed the 6 weeks follow-up. This study was conducted at KIOMS Hayatabad Medical Complex, Peshawar from 2nd April 2009 till 30 April 2010. The minimum age at which the patient presented was 50 years while the oldest patient was 80 years of age. 41.5% patients were in age range 50-55yrs in superior incision group while 32.1% were in age range 50-55yrs in temporal incision group. Detailed age distribution is shown in table I & II.

Fifty eight patients (54.7%) entering the study were male and 48 patients (45.3%) were female. The group wise gender distribution is shown in figure 1. Keratometries were performed on all eyes preoperatively at 1st postop day, at 2 weeks and at 6 weeks. Mean preoperative astigmatism was 0.524 ± 0.361 D in superior incision group. Type of preoperative astigmatism was with the rule in 45.3% eyes, against the rule in 47.2% eyes and neutral astigmatism in 7.5% eyes in superior incision group preoperatively shown in table III. Mean preoperative astigmatism was 0.670 ± 0.501 D for patients in temporal incision group. Type of preoperative astigmatism was with the rule in 37.7% eyes, against the rule in 50.9% eyes and 11.3% had neutral astigmatism in temporal incision group shown in table IV. Mean postoperative astigmatism was 0.709 ± 0.463 D, 0.839 ± 0.585 D, and 0.892 ± 0.645 D at 1st postoperative day, 2 weeks and 6 weeks respectively in superior incision group shown in table V. Mean postoperative astigmatism was 0.829 ± 0.671 D, 0.911 ± 0.620 D, and 0.894 ± 0.538 D at 1st postoperative day, 2 weeks and 6 weeks respectively in temporal incision group shown in table VI. It can be seen that mean postop astigmatism was higher in temporal incision group at 1st postop day and 2 weeks but it was almost equal in both groups at 6 weeks.

Mean SIA at 6 weeks postop was 0.367 ± 0.669 D in superior incision group and 0.225 ± 0.529 D in temporal incision group as shown in figure 2, this difference in
Comparison of Astigmatism in two Incision Sites in Manual Small Incision Cataract Surgery

Both groups was statistically insignificant (p = 0.257). Paired t test was applied on preop astigmatism and postop astigmatism at 6 weeks in both superior and temporal incision groups.

In superior incision group, site of superior incision was insignificantly affecting the amount of postop astigmatism at 6 weeks when compared with preop astigmatism (p value 0.139), while in temporal incision group, site of temporal incision showed a significant change in the amount of postop astigmatism at 6 weeks when compared with preop astigmatism (p value <0.001) as shown in table VII & VIII. When T test was applied to pre and postop astigmatism in both the groups, no significant difference was seen (p-value 0.089 and .990 for pre and postop astigmatism respectively) table IX.

Regarding type of postop astigmatism in terms of axis, in superior incision group, 7 eyes (13.2%) had with-the-rule astigmatism, 43 eyes (81.1%) had against-the-rule astigmatism and 3 eyes (5.7%) had neutral astigmatism. In temporal incision group, 46 eyes (86.8%) had postop with-the-rule astigmatism, 7 eyes (13.2%) had against-the-rule astigmatism and none of the eyes in this group had neutral astigmatism. Cross tabulation was performed among two variables i.e.; type of preop astigmatism and type of postop astigmatism to determine the significance of incision type on change in type of astigmatism in terms of axis, chisquare test was applied on these categorical variables and a p value less than 0.05 was taken as significant.

Results showed that in superior incision group, out of 24 eyes who had preop with-the-rule astigmatism, 7 eyes (29.1%) retained postop with-the-rule astigmatism, 14 eyes (58.3%) developed an against-the-rule astigmatism, and 3 eyes (12.5%) developed neutral astigmatism. All the 25 eyes (100%) who had preop against-the-rule astigmatism retained against-the-rule astigmatism postoperatively. Four eyes (100%) that had a preop neutral astigmatism developed against-the-rule astigmatism postoperatively details shown in table X. Chi-square test yielded a strong correlation among these variables when superior incision was applied (p = 0.005)

In temporal incision group, 20 eyes (100%) retained with-the-rule astigmatism postoperatively, 20 eyes (74%) that had preop against-the-rule astigmatism developed with-the-rule astigmatism postoperatively, and 6 eyes (100%) that had preop neutral astigmatism developed with-the-rule astigmatism postoperatively details shown in table XI. Chi-square test yielded a strong correlation among these variables when temporal incision was applied (p = 0.021). When Chi-square test was applied to type of astigmatism in both the groups, 81.1% eyes showed against the rule shift in superior incision group while 86.8% eyes showed with the rule shift in temporal incision group. This change in type of astigmatism was found to be statistically significant (p=0.000).

### Table I: Age distribution in superior incision group (n = 53)

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Number of eyes n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55</td>
<td>22 (41.5)</td>
</tr>
<tr>
<td>56-60</td>
<td>8 (15.1)</td>
</tr>
<tr>
<td>61-65</td>
<td>7 (13.2)</td>
</tr>
<tr>
<td>66-70</td>
<td>6 (11.3)</td>
</tr>
<tr>
<td>71-75</td>
<td>7 (13.2)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>3 (5.7)</td>
</tr>
</tbody>
</table>

n = Number, > = More than, % = Percentage

### Table II: Age distribution in temporal incision group (n = 53)

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Number of eyes n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55</td>
<td>17 (32.1)</td>
</tr>
<tr>
<td>56-60</td>
<td>10 (18.9)</td>
</tr>
<tr>
<td>61-65</td>
<td>5 (9.4)</td>
</tr>
<tr>
<td>66-70</td>
<td>12 (22.6)</td>
</tr>
<tr>
<td>71-75</td>
<td>6 (11.3)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>3 (5.7)</td>
</tr>
</tbody>
</table>

n = Number, > = More than, % = Percentage
Comparison of Astigmatism in two Incision Sites in Manual Small Incision Cataract Surgery

**Table V: T test (pre and post op astigmatism in both the groups)**

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Superior Incision Group</th>
<th>Temporal Incision Group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>Std.Deviation</td>
</tr>
<tr>
<td>Preop astigmatism</td>
<td>53</td>
<td>.5240</td>
<td>.3610</td>
</tr>
<tr>
<td>Post Op(at 6 Weeks)</td>
<td>53</td>
<td>.8927</td>
<td>.6456</td>
</tr>
</tbody>
</table>

Preop = Preoperative, Postop = Postoperative, Std = Standard, n = Number

**Figure No. 2: Mean Surgically Induced Astigmatism (SIA) at 6 weeks**

**TABLE VI: Chi-square test (type of postop astigmatism in both the groups)**

<table>
<thead>
<tr>
<th>Type of astigmatism</th>
<th>Superior Incision Group</th>
<th>Temporal Incision Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>With the rule</td>
<td>7</td>
<td>13.2%</td>
</tr>
<tr>
<td>Against the Rule</td>
<td>43</td>
<td>81.1%</td>
</tr>
<tr>
<td>Neutral astigmatism</td>
<td>3</td>
<td>5.7%</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Postop = postoperative

can affect the corneal astigmatism and ultimate visual outcome. In clear corneal surgery, placement of the incision on steep axis can help to reduce astigmatism within the meridian. In a keratorefractive surgery it was seen that astigmatism as low as 0.75 D may leave a patient symptomatic with visual blur, ghosting and halos.

In a study conducted on 1500 patients mean surgically induced astigmatism in MSICS at 6 weeks postop was found to be 0.3 D, another study showed a SIA of 0.69 D but these studies did not compare SIA at different incision sites. In our study mean SIA at 6 weeks in superior incision group was 0.367 ± 0.669 D which is comparable to earlier studies. In temporal incision group mean SIA at 6 weeks was 0.225 ±0.529 D, it can be seen here that temporal incision induced less mean SIA than superior incision but this difference was statistically insignificant (p value 0.257). A study conducted in India had found temporal incision to induce less SIA as compared with superior incision for MSICS, the mean SIA was 1.28 D for superior incision and 0.37 D for temporal incision group. The authors believed that temporal incisions were the farthest from the visual axis and gravity together with eyelid blink would create a drag on the superior incisions.

In our study, SIA was calculated by subtraction method, it is seen that superior incision group resulted in a higher SIA at 6 weeks. Exact cause is undetermined but it is possible that less mean preop astigmatism resulted in a higher SIA in this group. When only mean astigmatism present at 6 weeks was compared both groups had equal amount of astigmatism (0.892 D in superior incision group vs. 0.894 D in temporal incision group). In 2007, Ruit et al compared MSICS with Phacoemulsification, in their series all MSICS surgeries were performed by a temporal incision; mean astigmatism was 0.88 D which is comparable to mean astigmatism in temporal group of our study at 6 weeks. However another study showed higher mean postop astigmatism in superior incision than in temporal incision 1.45 vs 0.43 D respectively.

In superior incision group out of 24 eyes who had preop with-the-rule astigmatism, 7 eyes (29.1%) retained with-the-rule astigmatism they had preop astig-

**DISCUSSION**

Globally, treatment of choice for visually disabling cataract is surgical intervention. Extracapsular cataract extraction (ECCE) through a conventional large limbal or corneal incision and through a small incision are the two main surgical options available for surgical intervention required in the management of age related cataract in the developing countries. Advocates of phacoemulsification and MSICS cataract surgery report less postsurgical astigmatism along with earlier stabilization of refraction, visual acuity and early spectacle correction. MSICS technique was introduced by Ruit et al in 2000, and since then, this technique has grown in popularity in developing countries. The basic aim of this study was to compare the surgically induced astigmatism at two incision sites in manual small incision cataract surgery.

Cataract surgery has transformed into a refractive surgical procedure. Incision location in cataract surgery
matism equal to or more than 0.75 D. Fourteen eyes (58.3%) developed against-the-rule astigmatism along with 3 eyes (12.5%) with neutral astigmatism postoperatively. These 17 eyes were having preop astigmatism 0.5 D or less. All the 25 eyes having preop against-the-rule astigmatism retained against-the-rule astigmatism postoperatively. Astigmatism shift was seen in those patients in superior incision group with a preop astigmatism of 0.5 D or less. Tejedor and Murube, in a study of patients having with-the-rule astigmatism, recommended at least 1.5 diopters of corneal astigmatism in a superior incision in order to avoid a change in axis.16

In temporal incision group 20 eyes (100%) with preop with-the-rule astigmatism, retained with-the-rule astigmatism postoperatively. While 20 eyes (74%) having preop against-the-rule astigmatism along with 6 eyes (100%) having neutral preop astigmatism had a postop axis shift to with-the-rule astigmatism. Seventy percent of patients had axis shift were having preop astigmatism of 0.75 D or less. In one of the study, Seventy five percent of cases who had against-the-rule astigmatism and who underwent surgery through a temporal incision for an astigmatism axis shift of 90 degrees were found to have a preoperative astigmatism magnitude of less than 0.75 diopters.16 These results are comparable to our study and chi-square test showed a significant relationship between incision site and axis shift in astigmatism (P value 0.021). When both the groups were compared using chi-square test, a significant difference in type of postop astigmatism was noted with 81.1% of eyes in superior incision group having against-the-rule astigmatism while 86.8% of eyes in temporal incision group having with-the-rule shift (P value 0.000).

Studies have shown that if the magnitude of astigmatism is significantly reduced, the patient’s visual acuity could improve, even if axis shift occurs. However, it is generally accepted that reducing astigmatism without significantly changing the axis is well tolerated and should be the goal.17,18

In our study 50% patients in temporal incision group had against the rule astigmatism preoperatively which reduced to 13.2% postoperatively. Actual impact of this change could not be assessed because visual acuity assessment was not performed in this study. In a study conducted by Huang and Tseng from Taiwan, surgically induced astigmatism was compared between two groups of patients in which sutureless temporal clear corneal and sutureless temporal scleral frown incisions were given. It was concluded that scleral frown incision resulted in a much lesser amount of surgically-induced corneal astigmatism as compared to the clear corneal incision, which caused greater WTR astigmatism. This study also proved that corneal stability was achieved one week after scleral frown incisions as compared to clear corneal incisions in which case, stabilization of refraction delayed to 1 – 3 months postoperatively.19

In our study, the magnitude of the preoperative astigmatism did not affect the magnitude of the postop astigmatism at 6 weeks. Surgically induced astigmatism was higher in superior incision group, one possible cause of which can be less mean preop astigmatism in this group. Further research with astigmatism matched groups is required to provide a statistically significant association. We also analyzed that both incision sites had a statistically significant effect on postoperative axis shift.

Although the results of this study are significant and were comparable with most of the studies conducted world-wide, these results cannot be extrapolated to whole population due to smaller sample size and short follow-up, therefore we recommend long-term randomized studies on a larger and astigmatism matched sample size with longer follow-up.

**CONCLUSION**

Both superior and temporal incisions in MSICS resulted in almost same amount of mean astigmatism at 6 weeks (final follow-up) and mean SIA was found to be insignificantly different in both groups. Temporal incision group had the advantage of achieving with-the-rule astigmatism. It was seen in this study that applying superior incision on patients with preexisting with-the-rule corneal astigmatism could lead to axis shift to against-the-rule astigmatism. So selection of site of incision should be guided by amount and type of preoperative astigmatism.

**REFERENCES**

9. Gillje JP, Sanders DR. Use of small incisions to control induced
Dermatologic Signs of Multiple Myeloma

W. Harris Green, M.D., and Robert Hill Schosser, M.D.
East Carolina University, Greenville, NC

An 87-year-old woman presented for evaluation of progressive, non-pruritic, waxy papules and atraumatic ecchymoses in a periorbital (“raccoon eyes,” Panel A) and perioral distribution. She was otherwise asymptomatic. Examination of a biopsy specimen of a representative lesion revealed a nodular deposition of a hyalinized, amorphous material in the superficial dermis. Positive Congo red staining and apple-green birefringence under polarized light (Panel B) confirmed the presence of amyloid fibrils. Serum and urine electrophoresis with immunofixation revealed monoclonal kappa light-chain proteins. Levels of hemoglobin and serum calcium were unremarkable, as were the results of a radiographic skeletal survey. Renal function was stable, with only a mildly reduced glomerular filtration rate. Biopsy samples of bone marrow revealed that 22% of marrow cellularity consisted of plasma cells that stained predominantly for kappa light-chain proteins. A diagnosis of kappa light-chain multiple myeloma with systemic amyloidosis was made. After initial treatment with melphalan and prednisone, the patient’s condition stabilized, and at 2 years of follow-up she continued treatment with bortezomib alone. (Courtesy: NEJM-UK)
ABSTRACT

Objective: To compare the recurrence rate and complications after pterygium excision with bare sclera technique and amniotic membrane graft.

Design: It was a prospective, randomized control trial.

Place and Duration of Study: The study was conducted at the Department of Ophthalmology Khyber Teaching Hospital Peshawar, from January 2010 to December 2011.

Patients and Methods: Total of 100 patients were included in the study. Pre-operatively detailed history was taken from the patients and complete ocular examination was done. 50 patients were operated with bare sclera technique and 50 with amniotic membrane grafting. Post-operatively patients were followed up at 1 week, 1 month, 3 months and 6 months. At each visit patients were examined for any complications or recurrence.

Results: Out of the 100 patients, 73 were male and 27 were female. Mean age of the patients was 46.5 years. In the bare sclera group 17 patients (34%) had recurrence and in the amniotic membrane group 4 patients (8%) had recurrence (P value = 0.0026). With the bare sclera technique 15 patients had complications while in the amniotic membrane group 6 patients had complications.

Conclusion: Pterygium excision with bare sclera technique has high recurrence rate. Excision with amniotic membrane grafting decreases the recurrence rate and is associated with lower incidence of complications.

Key Words: Pterygium, Bare sclera technique, Amniotic membrane transplantation ocular, pregnancy, intraocular pressure, CSR.

INTRODUCTION

Pterygium is a fibrovascular lesion of the ocular surface. It is triangular in shape and has a head, body and tail. It is located in the inter-palpebral region, along the horizontal axis of cornea, usually nasally but occasionally also temporally or both nasally and temporally. Histologically there is Bowman’s membrane damage, fibrovascular growth as well as elastotic degeneration of various connective tissue elements.

There is a strong correlation between pterygium development and sun exposure. Therefore it is assumed that solar radiation may have a pathogenetic role. Ultraviolet radiations, particularly ultraviolet radiation-A (UVR-A) and ultraviolet radiation-B (UVR-B) may play a role. They induce ocular surface changes especially affecting the limbal stem cells and cause alterations in the expression of tumor suppressor genes, proto-oncogene mutations, induction of matrix metalloproteinases (MMPs) as well as alterations in the expression of various growth factors. Pterygium is characterized by chronic ocular surface inflammation, tearing, astigmatism and blurred vision due to involvement of visual axis. The natural history of the condition is variable, sometimes it can be static and may be associated with corneal linear iron deposition (Stocker’s line) along pterygium head. However, most of the pterygia exhibit progressive growth, especially those affecting younger individuals, and often require surgical excision.

Early pterygium removal technique was the ‘bare sclera’ technique. However, up to 50% of recurrence rate following a successful removal have been reported. A number of modifications have been made in the surgical technique in order to reduce the recurrence rate. These included conjunctival flap transposition, free conjunctival graft, the use of preserved amniotic membrane. Other ways of reducing the risk of recurrence include the use of beta irradiation, antime-tabolites e.g. mitomycin-C (MMC), alkylating agent Thiotepa and 5-fluorouracil (5-FU). Some studies have also evaluated the use of anti-vascular endothelial growth factor (anti-VEGF) antibodies such as Bevacizumab in pterygium management. The purpose of our study was to compare the recurrence rate and complications after pterygium excision with bare sclera technique and amniotic membrane graft.

METHODS

It was a prospective, randomized control trial. The study was conducted over a period of two years from January 2010 to December 2011, in Department of Ophthalmology, Khyber Teaching Hospital Peshawar.
Comparison of Recurrence Rate & Complications after Pterygium Excision

nation. A total of 100 eyes were included in the study i.e. 50 for each group.

**Inclusion criteria:**
1. Unilateral or bilateral nasal or temporal pterygium
2. Both genders
3. All age groups
4. At least 2mm growth onto the cornea

**Exclusion criteria:**
1. Recurrent pterygium after surgical excision
2. Ocular surface disease

Written informed consent was taken from all the patients. Detailed history was taken from the patients. Questions were asked about the patient’s chief complaints, occupation, living area, sun exposure, duration and rapidity of growth and any ocular or systemic co-morbidity. Complete ocular examination was done. Patients were randomly allocated into the two groups. 50 patients were operated with bare sclera technique and 50 with amniotic membrane grafting. All the surgeries were performed under operating microscope, using topical plus subconjuctival anesthesia, by the same surgeon. All patients were followed up at 1 week, 1 month, 3 months and 6 months post-operatively. At each follow up visit patients were examined for any complications or recurrence. Recurrence of pterygium was defined as a growth of 2mm or more over the cornea, after pterygium excision. SPSS-11 was used for data analysis.

**RESULTS**
A total of 100 patients were included in the study including 73 male and 27 female. Mean age of the patients was 46.5 years, with a range of 22-64 years. Age distribution of patients is shown in Figure 1. Gender distribution of patients in each group is shown in Figure 2. The patients were operated either by bare sclera technique or with amniotic membrane graft i.e. 50 patients for each group. All patients were followed up for 6 months. Recurrence of pterygium was noted in 21 out of 100 patients. The difference between the two surgical techniques was statistically significant (P value = 0.0026). In the bare sclera group 17 patients (34%) and in the amniotic membrane group 4 patients (8%) had recurrence (Table 1). A number of postoperative complications were noted with bare sclera technique including conjunctival granuloma in 6 patients, conjunctival cyst in 3 patients, symblepharon in 3 patients, corneal thinning in 2 patients and scleral thinning in 1 patient. In the amniotic membrane group 1 patient had corneal thinning and 5 patients had graft retraction before 10 days. Thus pterygium excision with amniotic membrane grafting had significantly lower complication rate as compared to bare sclera technique (P value = 0.0479). All the surgical complications were properly managed.

**DISCUSSION**
Pterygium excision is considered as a simple surgical procedure, however it has a high recurrence rate and recurrence is often more aggressive than the initial lesion. The simplest technique for pterygium excision is the bare sclera procedure which was described by Ombrain.

Bare sclera technique is an easy method but is associated with a high recurrence rate. In one study the recurrence rate after this technique was 36.6%. In a study conducted by Ashaye there was 40% recurrence rate while Dash and Bapor observed 25% recurrence rate. One study showed recurrence rate as high as 89%. In our study the recurrence rate was 34% which was similar to some of the older studies. Thus recurrence rate after pterygium excision with bare sclera technique is very high. A number of techniques have been em-
ployed to reduce the recurrence rate after pterygium excision including amniotic membrane transplantation.

Amniotic membrane was first used in ophthalmology by De Roth for conjunctival surface reconstruction.25 The possible mechanisms by which it prevents pterygium recurrence include promotion of conjunctival epithelium, inhibition of inflammation by inhibiting chemokine expression by fibroblasts26,27 and interleukin-1 expression by epithelial cells, and inhibition of neovascularization by inhibiting vascular endothelial cell growth.28

The recurrence rate after amniotic membrane transplantation was initially reported to be 10.9% for primary and 37.5% for recurrent pterygia.29 After modifying the surgical technique, these values were reduced to 3% and 9.5% respectively,30 which is superior to that of the bare sclera technique. In a study conducted by Katbab et al, the recurrence rate following amniotic membrane graft for primary pterygium excision was 2% over a 12-month follow-up period.31 In our study the recurrence rate was 8%. The difference in recurrence rate between the two surgical techniques was statistically significant (P value = 0.0026).

Recurrence occurred in 14 out of the 73 male (19.17%) and 7 out of 27 female (25.92%). The difference in recurrence rate between male and female was not statistically significant (P value = 0.5807). A number of postoperative complications were noted with bare sclera technique including conjunctival granuloma in 6 patients (12%), conjunctival cyst in 3 patients (6%), symblepharon in 3 patients (6%), corneal thinning in 2 patients (4%) and scleral thinning in 1 patient (2%). In the amniotic membrane group 1 patient had corneal thinning (2%) and 5 patients (10%) had graft retraction before 10 days. Thus pterygium excision with amniotic membrane grafting has significantly lower complication rate as compared to bare sclera technique (P value = 0.0479). All the complications in our patients were properly managed.

Amniotic membrane grafting is not routinely performed in pterygium excision surgery. Despite lack of experience with amniotic membrane grafting, we found lower rate of recurrence and complications with this technique. Therefore pterygium excision with amniotic membrane grafting could be considered as a very good alternative in the management of pterygium.

CONCLUSION

Pterygium excision is a common surgical procedure. Pterygium excision with bare sclera technique has a very high recurrence rate. Excision with amniotic membrane grafting is a simple and easy surgical technique, reduces the risk of recurrence and has a lower incidence of post-operative complications.

REFERENCES:

INTRODUCTION

Myopia is one of the most frequent refractive errors in general population. Its prevalence ranges from 17-65% and varies according to age, gender and race.1,2 The complications of high myopia include macular degeneration, retinal detachment, glaucoma and cataract. The aetiology of myopia is unknown but the cornea is responsible for approximately two-third of optical refraction.2 The myopic eye has a steeper central corneal curvature and is longer than normal emmetropic eye.3 If this is the result of general growth, then one might expect the cornea to have grown to be thicker than normal and a correlation with body mass index (BMI) might exist. It has been reported that thinner corneas results in artificially lower intraocular pressure readings and thicker corneas cause elevated IOP readings4. Central corneal thickness of ocular hypertensive patients are reported to be greater than normal controls while it is much thinner in eyes with normal tension glaucoma.5 In eyes with thinner corneas there is an increased risk of conversion from ocular hypertension to glaucoma.6 A direct relationship between the central corneal thickness and refractive error has been reported but the process by which myopia progresses does not influence the central corneal thickness to a measurable degree.7,8

Over time it has been shown that myopic refractive errors are associated with thin central corneal thickness.

The prevalence of glaucoma is high in myopic eyes and studies have shown that myopic eyes had a 1.6 to 3.3 times increased risk of glaucoma.9 The reason for this is suggested to be that intraocular pressure is higher in myopic eyes than in normal and these eyes are more susceptible to the effects of elevated intraocular pressure.10 It has been also proposed that myopic eye have abnormal connective tissues that could predispose to glaucoma.11 For a given IOP in eyes with glaucoma, optic nerve damage appear to be more pronounced in highly myopic eyes with large optic disc than in non-myopic eyes.12 This suggests a higher susceptibility for glaucomatous optic nerve fiber loss in myopic eyes compared with non-myopic eyes.13 In some studies a significant relationship has been reported between intraocular pressure and refractive error whereas in other studies no such correlation is established.14,15

The purpose of the study is to determine the relationship of myopia with intraocular pressure and central corneal thickness in our population. Establishing these parameters are important because CCT affect IOP and in decision making for glaucoma treatment. These are also important for refractive surgery because CCT and IOP may indicate whether a particular refractive surgical procedure is to be applied or not.

METHODS

The study was carried out in Khyber Teaching Hospital and Rehman Medical Institute Peshawar.
from November 2011 to October 2012. Patients with known myopia or newly diagnosed myopia were included in the study. Those with emmetropia, corneal or lenticular opacities, pseudophakic, aphakic, myopia less than 0.5D and astigmatism of more than 3D or other ocular surface disease were excluded from the study. All Patients were first refracted to determine their refractive status. Measurements of refractive status were taken with Cannon MR-3100 autorefractometer. Readings were then confirmed subjectively using Heine retinoscope and the spherical equivalent of the refractive error was obtained. Central corneal thickness was assessed with pachymeter (Packot 2 Quantel Medical SR-2171) by placing the probe on the anaesthetized cornea. Measured central corneal thickness for the subject was taken as the average of three different readings and recorded in micrometer. The IOP was assessed with Haag-Streit slit-lamp biomicroscope mounted Goldman applanation tonometry and staining the eye with fluorescein strip after anesthetizing cornea. Three consecutive readings are taken and the average recorded as measured IOP in mmHg.

Patients are categorized into 3 groups depending upon the amount of myopia, in group I patients with low myopia (-0.5D to -3D), in group II moderate myopia (≥-3D to -6D) and in group III patients with high myopia (≥-6D) were included. The statistical tests used in this study were t-test, Pearsons correlation coefficient and P value with a value less than or equal to 0.05 (5%) were considered statistically significant.

RESULTS

A total of 400 eyes of 200 myopic subjects were enrolled in the study fulfilling the inclusion criteria. There were 223 (55.75%) male and 177 (44.25%) female. Age range was 10-65 years with a mean age of 26.37 ± 9.60 years. The incidence of low myopia (Group I) was 297 (74.25%) with 172 (57.91%) male patients and 125 (42.08%) female patients. Patients with moderate myopia (Group II) were 80 (20%) with 42 (52.5%) male and 38 (47.5%) female patients. The incidence of high myopia (Group III) was 23 (5.75%) with 9 (39.13%) male and 14 (60.87%) female patients. Patients with low myopia have a mean IOP of 15.40± 2.75, that of moderate myopia has 15.63 ± 2.72 and patients with high myopia have a mean IOP of 16.12 ± 2.84. The mean central corneal thickness in group I was 548.5 ± 31.24 micrometer, in group II was 539.3 ± 30.74 micrometer and in group III was 542.7± 28.37 micrometer (Table 1).

DISCUSSION:

Numerous studies have been carried out showing the relationship of myopia with central corneal thickness and intraocular pressure with conflicting results. In a study done by VonBahr reported myopic corneas to be slightly thinner than normal, whereas in another study done by Nomura H and collegeus stated that moderate to high myope corneas are thicker than hypermetropes or emmetropes.

Goldman applanation tonometry is widely accepted as international gold standard for intraocular pressure measurement and is the most commonly used method. Intraocular pressure with Goldman tonometry varies with thickness of the cornea, the thicker the cornea, the higher the intraocular pressure.
et al reported a normal range of corneal thickness to be 530-555 micrometer.\textsuperscript{20} The inter-patient variation in CCT could be a source of error with Goldman tonometry, where thick corneas causes an overestimation of IOP. Patients with normal tension glaucoma have a high incidence of thinner corneas. Population based studies have shown that there is an increased incidence of glaucoma in myopic patients. In our study Pearson correlation coefficient showed that there was no significant association between myopia and IOP (mean IOP in Group I= 15.40 ± 2.75, Group II= 15.63 ± 2.72, Group III= 16.12 ± 2.84 mmHg) with (\(r=0.03, p>0.05\)). These finding in our study was consistent with study of Lee et al and another study done by Valiki and colleagues which showed no significant association between refractive error and IOP.\textsuperscript{21,22} Our study showed a slight relationship between different groups of myopia and central corneal thickness (mean CCT in Group I=548.5 ± 31.24, Group II=539.3 ± 30.74, Group III=542.7 ± 30.87 micrometer) with (\(r=0.18, p>0.05\)) but it was not clinically significant. Similar observation was also in study of Prince and colleagues who claimed that CCT is not significantly affected by refractive errors.\textsuperscript{23} In our study it was also showed that there is no significant difference between the mean CCT of males (Group I=549.4 ± 33.21, Group II=544.6 ± 29.62, Group III=543.7 ± 28.64 micrometers) and female (Group I=545.5 ± 31.4, Group II=543.3 ± 29.37, Group III=541.5 ± 27.74 micrometer) in all three groups of myopia (\(t=1.03, p>0.05\)). Similarly no significant difference was detected in mean IOP of males (16.2±2.81) and females (15.5±2.73) in all myopia groups (\(p>0.05\)). So neither CCT nor IOP was significantly affected by gender similar to the study of Lleo et al who reported no significant difference in mean IOP between males and females.\textsuperscript{24} In our study very mild relationship was found between CCT and IOP (\(r=0.106, p<0.005\)), but that was not clinically significant.

**CONCLUSION**

There is no significant relationship of mild, moderate or severe myopia on central corneal thickness and intraocular pressure. Similarly Central corneal thickness and intraocular pressure is not affected by gender.

**REFERENCES**

Comparison of Results of Pterygium Excision Through Bare Sclera Technique & Conjunctival Autograft

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Zaman Shah FCPS\textsuperscript{4}, Prof. Naimat Ullah Kundi FCPS\textsuperscript{5}

ABSTRACT

Objective: To study the results of primary pterygium excision through bare sclera technique and conjunctival autograft.
Study design: This was an analytical study.
Setting and Duration: This study was conducted at Eye Unit, Khyber Teaching Hospital, Peshawar from May, 2007 to April, 2009.
Methodology: One hundred patients with primary pterygium were selected from Ophthalmology Dept. OPD at Khyber Teaching Hospital, Peshawar. Detailed history was taken. Complete ocular examination done and those fulfilling inclusion criteria were included in the study. Anesthesia used was topical proparacaine 0.5% and local infiltration of 2% lignocaine. In 50 patients, pterygium was excised through bare sclera technique while conjunctival autograft was transplanted in the remaining. Patients were followed up till three months.
Results: In bare sclera group, recurrence rate was 70\% (35 patients) while in conjunctival autograft group, it was 08\% (04 patients). There was one case of conjunctival granuloma in bare sclera group.
Conclusion: Pterygium excision through simple bare sclera technique has significantly high recurrence rate as compared to conjunctival autograft transplantation.

INTRODUCTION

Pterygium, with a prevalence rate ranging from 0.3 to 29\%, is a common disorder in many parts of the world. Chronic exposure to sunlight has been associated with pterygium formation. Epidemiological studies have revealed increased pterygium prevalence within a periequatorial ‘pterygium belt’ of latitudes of 37 deg north and south of the equator.\textsuperscript{1,2}

Pterygium is characterized by elastic degeneration of collagen and fibrovascular proliferation with an overlying covering of epithelium. Histopathology of abnormal collagen shows basophilia with hematoxylin and eosin stain.\textsuperscript{3,4}

Several techniques have been developed for treatment of pterygium which are:\textsuperscript{5}
1. Simple bare sclera technique
2. Excision with adjunctive therapy like MMC
3. Conjunctival autografting

Pterygium recurrence has been significantly reduced from 30-80\% with bare sclera technique\textsuperscript{6,7,8} to almost 5.3\% (9) with conjunctival autograft. Conjunctival autografting, described by Kenyon in 1985,\textsuperscript{9} differs from bare sclera resection in that a free conjunctival graft, usually originated from superotemporal bulbar conjunctiva, is sutured over denuded sclera after pterygium resection.\textsuperscript{10,11}

The corneal epithelial integrity is maintained by the epithelial stem cells which are believed to be located in the basal cell layer of the peripheral cornea. These stem cells undergo continuous turn over throughout adult life.\textsuperscript{12,13,14}

MATERIALS AND METHODS

Hundred patients with primary pterygium were selected from eye OPD at Khyber Teaching Hospital. They were randomly distributed in two groups. In group A, were included the patients who underwent bare sclera resection. While in group B, patients were operated with conjunctival autograft.

Detailed history was taken enquiring the patients about their symptoms and duration, occupation, outdoor activity, exposure to sunlight glaucoma, diabetes mellitus and hypertension. They were thoroughly examined measuring visual acuity, extraocular movements assessment, slit lamp examination of the pterygium and ocular surface, fundoscopy and IOP measurement.

Inclusion Criteria:
• Age between 21-60 years
• Both sexes
• Primary pterygium encroaching 2mm or more over the cornea
• Pterygium causing decreased vision
• Pterygium with repeated episodes of congestion and grittiness

Received November 2013   Accepted: December 2014
Exclusion Criteria:
- Diabetes Mellitus
- Collagen Vascular Disease
- Ocular surface disease like dry eye syndrome
- Uncontrolled glaucoma

Those fulfilling inclusion criteria were operated under microscope. Anesthesia used was topical proparacaine hydrochloride 0.5% and subconjunctival inj of lignocaine hydrochloride 2% in the pterygium bed. Pterygium was peeled off its bed. Cornea was scraped with number 15 bard parker blade. In group A, sclera was left bare after pterygium resection. In group B, an autograft was taken from the superotemporal bulbar conjunctiva of the same eye and transplanted at the denuded sclera in a way that the limbal side of the graft was oriented towards the limbus of the previously pterygium site. Conjunctiva was stitched with 10/0 nylon leaving the knot ends long so as not to cause irritation.

Antibiotic-steroid combination was given 4 times daily for one month postoperatively. patients were re-examined at postoperative day 1,14,30,60 and 90. Recurrence was defined as fibrovascular growth encroaching over the cornea 1mm or more. Data were analysed using SPSS version 10.0.

RESULTS

Hundred patients were operated. Seventy five (75%) patients were male while twenty five (25%) were female. Thus male to female ratio was 3:1. (Figure)

<FIGURE: Gender distribution>

The patients’ age range was 21-60 years with mean value of 40 years. Majority of the patients (40%) were in the age range of 31-40 years. There was a vast majority (85%) of outdoor workers with an exposure to ultraviolet radiation.

Recurrence was noted in 35 patients (70%) in group A, while in group B, recurrence was observed in 4 patients (08%). There was one case of conjunctival granuloma noted in group A. No undesirable effect was seen at the bare donor conjunctival site. And during the follow up period, it was seen to be covered by the growth of the adjacent tissue. (Table)

<table>
<thead>
<tr>
<th>TABLE: Recurrence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
</tr>
<tr>
<td>Group B</td>
</tr>
<tr>
<td>Group B</td>
</tr>
</tbody>
</table>

DISCUSSION

Clinically, pterygium is a wing shaped fibrovascular growth arising from the bulbar conjunctiva onto the cornea. It is composed of a body which overlies the sclera and a head which conforms the leading edge.15

Pterygium has been treated using different surgical modalities. The unacceptably high rate of recurrence has been the main problem for the surgeons.16 Recurrence rates following bare sclera resection range from 24% to 89%, following bare sclera resection with Mitomycin application between 3% to 37.5% and following pterygium resection with conjunctival graft placement between 2% and 39%.17-22 In this study, we compared bare sclera resection with conjunctival autograft placement. Our study was comprised by 75% males. Male to female ratio was 3:1. The same ratio was observed by Baig in his study.23

Our patients were mostly outdoor workers who were exposed to ultraviolet radiations and the dry, dusty and hot weather. This was also noted by Rasool in his study while comparing conjunctival autograft with bare sclera resection.24

CONCLUSION

In our study, we found recurrence rate of 70% in group A and 08% in group B. Fahmi et al reported a recurrence rate of 13.3% with conjunctival autograft.25 Lewallen presented the results of conjunctival autografting in his study. He documented lower recurrence rate (21%) in conjunctival autograft cases compared with bare sclera resection (37%).26 Allan et al was in support of Lewallen documenting a recurrence rate of 14% in conjunctival autograft cases.27 A positive relationship was suggested between youth and pterygium recurrence, while advancing age has a protective effect. This trend was also seen by Rasool.24

REFERENCES

6. Frutch-pery J, Charalambos SS, Isar M. Intraoperative applica-
Comparison of Results of Pterygium Excision Through Bare Sclera Technique

Changes in Retinal Nerve Fiber Layer &
Optic Disc Algorithms by Optical Coherence Tomography
in Glaucmatous Arab Subjects

Dr. Ferial M Zeried MD., & Dr. Uchechukwu L Osuagwu MD.,

INTRODUCTION

Glaucoma is the second-leading cause of blindness worldwide, accounting for around 12.3% of total blinding cases and estimated to affect about 66.8 million people. Among the population aged 40 years and above, the prevalence could increase from 2.65% in 2010 to 2.86% in 2020. In our region, glaucoma contributes to about 11% of total blinding causes, ranking as the second-biggest cause of blindness after cataract (49%). In one study, it was reported that 44.5% of the glaucoma patients in the country had no prior knowledge of their condition, and 11.3% of them were bilaterally legally blind, and it is no doubt a worrying situation. The global burden of glaucoma is heavy, and it is even heavier in Saudi Arabia because of the high rate of consanguinity. Understanding the pattern and the associated characteristics of glaucoma is an essential and crucial step for early diagnosis and proper management of the disease.

Evaluation of the retinal nerve fiber layer (RNFL) and optic disc are fundamental for diagnosing and managing glaucoma. Evaluation of these areas is currently the standard procedure for detection of early glaucomatous retinal damage, as well as monitoring the progression of the disease. However, new imaging techniques have been introduced for the early detection, management, and monitoring of glaucomatous damage.

Optical coherence tomography (OCT) is one of the promising technologies capable of discriminating between glaucomatous and healthy eyes using various algorithms. Despite the recent introduction of spectral domain OCT, Stratus OCT 3000 is one of the new generation of instruments with improved capabilities. The number of measurements per scan was increased up to 768 A-scans per image, and the axial resolution improved from 100 μ to 10 μ, in order to enhance the ease of instrument use. In addition, the Stratus OCT also incorporates 18 different protocols that are used for image acquisition, and an algorithm to assess the optic nerve head (ONH). It is also equipped with multiple RNFL and ONH asymmetry parameters that are used for detection of glaucoma.

MATERIAL & METHODS

A total of 65 patients (36 glaucoma and 29 normal patients) aged 50.1 ± 7.7 years (range 40–67 years) met the following criteria: age ≥40 years, visual acuity ≥20/40, spherical refractive error between −6 and +6 diopters (D), astigmatism ≤3 D, an open angle, good-quality OCT images, and reliable visual field indices obtained from the Program 32 dynamic strategy (Octopus 101 automated perimeter). Normal eyes had intraocular pressure (IOP) >8 mmHg but <18 mmHg measured on at least three different days before the time of OCT examination. Glaucoma patients had Goldmann applanation tonometer IOP >21 mmHg on at least three different occasions and a glaucomatous visual field (Program 32 dynamic test result showing a cluster of four or more contiguous points on the corrected comparison plot and a probability value of <5% confirmed on at least one visual field).

Patients were excluded if they had other intraocular or neurologic diseases that affected the RNFL, optic disc, or visual field; secondary causes of increased IOP; non-glaucomatous disc abnormalities; corneal opacities; advanced cataract; or a history of ophthalmic surgery. One eye of each patient was enrolled. If both eyes met the inclusion criteria, one eye was randomly selected.

Examination Procedure

All patients underwent a complete ophthalmic examination, including medical and family history, visual acuity measurement, tonometry, slit-lamp examination of the anterior and posterior segments, and the Program 32 dynamic strategy. The Stratus OCT was used for ocular imaging in subjects after dilation with one drop of tropicamide 1%. Cross-sectional images from the macula, ONH, and peri-papillary regions were obtained in all patients on the same visit.
The RNFL thickness was obtained by the Stratus OCT using a near infrared low-coherence diode laser (840 nm) and a Michelson-type interferometer. Three images consisting of 256 A-scans along a 3.4 mm diameter circular ring around the optic disc were acquired over 1.92 seconds for each patient.

To ensure the good quality of RNFL images, a minimum of five scans were taken and the best three were chosen for this study.

RESULTS

The demographic data of all patients and the results of unpaired t-test comparison between-group demographics have been represented in Table 1. The mean ages of patients with glaucoma (51.9 ± 8.5 years), and normal patients (47.7 ± 6.0 years) were not statistically significantly different (P = 0.12), thereby controlling any age-related effects on analysis. Average spherical equivalent ± standard deviation (SD) refractive error was −0.3 ± 1.0 D for normal eyes, and −0.5 ± 1.9 D for glaucomatous eyes (P = 0.57). The average RNFL thickness was not statistically significantly associated with age of normal (R² = 0.001, P = 0.86) and glaucomatous (R² =0.002,P = 0.79) patients. Also, the mean RNFL thicknesses measured at the four quadrants were not statistically significantly associated with age of both groups. The R² values (P-values) for the mean RNFL thicknesses at the four quadrants in normal patients were temporal 0.10 (P = 0.09), nasal 0.07 (P = 0.16), superior 0.03 (P = 0.39), and inferior 0.02 (P = 0.44). None of the optic nerve parameters (the rim area, average nerve width at disc, disc diameter, cup diameter, rim length, VIRA, HIRW, disc area, cup area, C/D area ratio, horizontal C/D ratio, and vertical C/D ratio) was significantly associated with age of normal (R² < 0.10, P > 0.05; for all) and glaucomatous (R² < 0.14, P > 0.05; for all) patients.

<p>| Table 1: Demographic characteristics of the study sample (65 patients [36 glaucoma and 29 normal patients]) |
|--------------------------------------------------|--------|--------|--------|</p>
<table>
<thead>
<tr>
<th>Sample</th>
<th>Control</th>
<th>Glaucoma</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no of eyes</td>
<td>Right</td>
<td>15 (51.7%)</td>
<td>20 (55.8%)</td>
</tr>
<tr>
<td></td>
<td>Left</td>
<td>14 (48.3%)</td>
<td>16 (44.4%)</td>
</tr>
<tr>
<td>Age(y)</td>
<td>Mean (± standard deviation)</td>
<td>47.7 (±6.0)</td>
<td>51.9 (±8.5)</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>40-60</td>
<td>40-67</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>14 (48.3%)</td>
<td>20 (55.6%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>15 (51.7%)</td>
<td>16 (44.4%)</td>
</tr>
<tr>
<td>Mean Defect</td>
<td>Mean (± standard deviation)</td>
<td>1.2 (±1.4)</td>
<td>-2.5 (±1.5)</td>
</tr>
</tbody>
</table>

Intergroup Comparison of Fast Rnfl Algorithm:

The greatest percentage changes in RNFL thickness were observed at the inferior (39.5%) and superior (39.3%) quadrants. A plot of RNFL thickness variation across the twelve clock hour sector in both groups showed that the greatest percentage reductions in RNFL thickness in the glaucomatous eyes in relation to the normal eyes occurred at the 1 o’clock (43%) and 5 o’clock (40%) sectors.
inferior minus temporal, respectively, and in the glaucomatous eyes.

Across the twelve 30° clock hours, the RNFL in normal eyes was thickest at 6 o’clock hour sectors and thinnest at 9 o’clock hour sectors. For the glaucoma eyes, it was the thickest at the 6 o’clock hour sector with 3 o’clock and 9 o’clock hour sectors being the thinnest.

DISCUSSION

OCT has been widely used to characterize multiple pathologic conditions and collect morphological information for clinical and surgical decision making. Studies have reported the usefulness of OCT in diagnosing and managing glaucoma elsewhere in the world but not in Saudi Arabia. The RNFL thickness was reported to decrease significantly with age, and with an estimated loss of approximately 5,000 axons per year from birth to death reported in humans. Using OCT, Girkin et al. also observed that age was associated with rim area, RNFL thickness, and inner retinal thickness. On the contrary, and similar to an observational, cross-sectional study conducted on 119 eyes of 60 normal Indian subjects, the current study found that age was not predictive of RNFL measurements.

In the current study, the average RNFL was thinner in glaucomatous eyes by about 36.7%. The percentage thinning of the RNFL was greater at 1 o’clock and 5 o’clock hour sectors, the inferior and superior quadrants. These results are consistent with those of previous studies in which the RNFL thinning in the inferior quadrant had the best discriminating ability for detection of glaucoma. Medeiros et al. showed that the RNFL thickness of the Stratus OCT performed better than the ONH and macular parameters in discriminating eyes that progressed by visual fields and/or optic disc stereo-photographs from eyes that did not. Nouri Mahdavi et al. found the superior quadrant RNFL thickness at the 11 o’clock position to be the best parameter for detection of early glaucomatous change, whereas Kanamori et al. found the inferior quadrant and global RNFL thickness to be the best discriminating parameter. Similarly, in the current study, it was observed that the inferior quadrant and the 1 O’clock hour sector thickness of the RNFL algorithm showed the greatest changes in thickness in the early glaucomatous eyes. These changes in the inferior RNFL are in agreement with the expected pattern of damage in glaucomatous optic neuropathy.

Previous reports have found Stratus OCT fast optic disc algorithms to be reproducible, reasonably accurate, and to perform well in discriminating eyes with glaucomatous visual field loss from healthy eyes. However, in one longitudinal study, the fast optic disc parameters performed poorly in their ability to differentiate between progressing and non-progressing glaucomatous eyes. Anton et al. and Zangwill et al. also found significant differences between normal eyes and ocular hypertensive eyes in optic disc parameters. The current study also observed significant differences in the optic disc parameters in glaucomatous eyes in relation to normal eyes. The disc area, cup area, and mean C/D ratio were significantly larger by 15.5%, 66.6%, and 60.4%, respectively, whereas the VIRA, HIRW, and rim area were significantly smaller by 62.2%, 37.0%, and 59.0% in the glaucomatous eyes, in relation to normal eyes. The current study also showed that except for the disc area, other ONH parameters performed well in differentiating early glaucomatous eyes from normal eyes. The vertical elongation of the optic disc observed here is thought to be due to severance and depletion of the superior and inferior arcuate fibers, which occurs in early stages of glaucoma.

The results presented here also showed that both group eyes obeyed the ISNT rule (Inferior, Superior, Nasal, Temporal) in a similar pattern in relation to RNFL thickness. In both groups, significant differences in quadrant RNFL thickness were observed, with the thickest and thinnest RNFL quadrants being the inferior and temporal quadrants, respectively. It also confirms that the severance of the nerve fibers and excavation of the disc are unique features of glaucoma.

The findings of the current study are limited to patients with early glaucoma and, as such, cannot be applied to ocular hypertensive patients and/or patients with a more advanced glaucoma. Also, the ages of our subjects were much younger than is generally anticipated for glaucoma. However, the study presents for the first time the diagnostic importance of the device in discriminating between glaucomatous damage and normal subjects of Saudi Arabian origin. A future study in the region should consider recruiting a larger number of subjects of a wider age range as well, in order to investigate the discriminating ability of both algorithms and the effects of age of retinal measurements.

It is important to note that because the calculation of the ONH parameters was estimated based on six linear scans cutting cross-sectionally over the optic disc, disc areas lying between the scan lines were not subject to the analysis. As a result, the sensitivity in detecting a highly localized optic disc abnormality may be reduced in the OCT. Second, with the current version of the analysis software, it is not yet possible to get individual clock hour ONH measurements. On the other hand, comparing the performance of Stratus and its latest version (Cirrus OCT) revealed that the two devices have similar diagnostic potentials in pre-perimetric glaucoma. The study also noted that in a subset of patients a total of 16 RNFL defects that were not seen in the RNFL photography of the Stratus OCT were detected in the Cirrus OCT deviation-from-normal maps. It was not clear whether these defects were false-positive findings.
or whether they represent true RNFL losses. Though the true nature of these OCT defects may be confirmed by a follow-up assessment, the performance of OCT in such cases should be re-evaluated through a prospective longitudinal study. Thus, if a definite glaucomatous change occurs in the case in which OCT had previously detected an abnormality, OCT may predict the future development of glaucoma in these questionable cases.

CONCLUSION:
Both algorithms were capable of differentiating early glaucomatous eyes from normal eyes, with the best parameters being the RNFL algorithm in the inferior, superior, and 1 o’clock hour sector; the cup area; and VIRA (optic disc algorithm). A combination of the results from both algorithms of a patient will lead to a better diagnostic precision. The use of this device or its newer generation should be encouraged in glaucoma clinics in Saudi Arabia.

REFERENCES
Diabetic Neuropathies: as Indicators of Oxidative Stress & their Correlation to Glucose-6-phosphate Dehydrogenase Activities

Jariya Wajahat, MBBS, M. Phil, Fatahiya Kashif, MBBS, M.Phil

ABSTRACT:
Objective: Today diabetes is a major cause of mortality and morbidity. Diabetic complications like neuropathies, are manifestations of oxidative stress. Glucose-6-phosphate dehydrogenase (G6PD) actively plays an important role in oxidative stress by providing NADPH, which helps to fight against oxidative stress.

Material & Methods: This study was conducted from March 2009 till February 2010. Eighty subjects were selected from the people who came to get their fasting glucose level checked. These were categorized as controls, high risk individuals, diabetics or metabolic syndrome (MS) sufferers on basis of WHO criteria. The subjects were tested for G6PD activities. G6PD activities were correlated to the extent of development of neuropathies according to Michigan Neuropathy Screening Instrument (MNSI).

Results: For MNSI scores showed that mean values of Diabetic and MS groups were significantly higher than that of controls. MNSI scores were correlated to G6PD values. The higher MNSI scores tend to correspond with lower values of G6PD.

Conclusion: It may imply that low G6PD activities contribute towards development of complications like diabetic neuropathies or possibly G6PD supplements may help diabetics to prevent development of neuropathies. Further studies including NADPH and Glutathione ratio may help confirm exact role of G6PD in preventing diabetic complications.

Key words: Diabetic neuropathies, Glucose-6-phosphate dehydrogenase, NADP, Metabolic Syndrome X

INTRODUCTION
Diabetic neuropathy is the damage to nerves caused by diabetes. It affects about 50% people with diabetes, its common symptoms are tingling pain, numbness or weakness in feet and hands. Data regarding glucose, nerve dysfunction and oxidative stress from cell culture studies are still limited, but few data, which are available indicate that there is impaired antioxidant activity which can be a cause of oxidative stress. Microvascular changes are the final common pathway for development of late diabetic complications, including peripheral and autonomic neuropathies. Oxidative stress leading to nerve damage is illustrated in Fig: 1.

SUBJECTS AND METHODS
The subjects were selected from the ambulatory patients who came to get their fasting glucose level checked, on outpatient basis, at pathology laboratory of Combined Military Hospital (CMH), Lahore. Eighty patients were enrolled for assessment of the spectrum of disease and were categorized as controls, high risk individuals, diabetics or metabolic syndrome (MS) sufferers on basis of history, physical examination and baseline lab investigations for fasting glucose and lipid profile. An informed written consent was obtained from all subjects recruited in this study. The study was approved by the Advanced Studies and Research Board of the University of Health Sciences, Lahore.

Individuals were identified as high risk in accordance with the criteria laid down by WHO: High risk individuals were identified as being high risk on fulfilling any one of the following criteria: over weight (BMI > 25) or hypertensive (BP > 140/90) or having HDL cholesterol less than 0.9 mmol/L (<35mg/dl) or triglyceride higher than 2.82 mmol/L (>250mg/dL) or having impaired fasting glucose 5.5-6.9 mmol/L (100-125mg/dL after overnight fast) or impaired glucose tolerance 7.7-11mmol/L (140-199 mg/dL after 2 hr glucose tolerance test)

Diabetics were selected according to the following WHO criteria: (i) Fasting plasma glucose
greater than or equal to 7 mmol/L (126 mg/dL) or post prandial plasma glucose greater than or equal to 11.1 mmol/L (200 mg/dL). Subjects who had central abdominal obesity, defined as waist circumference, measured at midpoint between lower rib and anterior superior iliac spine (cut off point: waist circumference ≥ 90 cm for males and ≥ 80 cm for females) or BMI ≥ 30 plus any two of the following according to IDF criteria, were labeled as MS patients: (ii) Serum triglycerides ≥ 150 mg/dL (1.7 mmol/L) or specific treatment for this abnormality. (ii) Low HDL cholesterol < 40 mg/dL (1.03 mmol/L) in males or ≤ 50 mg/dL (1.29 mmol/L) in females, or specific treatment for this abnormality. (iii) Raised systolic BP ≥ 130 mmHg or diastolic BP ≥ 85 mmHg or treatment of previously diagnosed hypertension. (iv) Raised fasting plasma glucose ≥ 100 mg/dL (5.6 mmol/L) or previously diagnosed type 2 diabetes mellitus. Twenty unrelated healthy subjects without history of diabetes or hypertension, matched for age and gender with high risks, diabetics and MS patients were randomly selected from general population to serve as controls. Patients were tested for touch and vibration sense using common pin, cotton wool and tuning fork and MNSI score which is a screening criteria for diabetic neuropathy was noted. Patients having any other morbidity due to some chronic infection or disease like cancer were excluded. In our sample three patients turned out to be hepatitis C positive, they were excluded and one patient had tuberculosis, he was also excluded.

The participants in control group were healthy individuals and exclusion criteria included over weight, or impaired fasting glucose. Mean age for all participants was 35 ± 1 SD, in all groups male to female ratio was 7:3.

Sensory system examination included testing for: pain sensation (pin prick), light touch sensation (brush), position sense, stereognosis and graphesthesia.

**Pain and Light Touch:** Subjects were allowed to touch the common pin needle and cotton wool ball prior to beginning to alleviate any fear of being hurt during the examination. The subjects were instructed to lie supine on examination couch with the eyes closed and were told to raise index finger when they felt the pin/cotton wool sensation. The subjects were tested alternately with pin needle and cotton wool at intervals of roughly 5 seconds. Examination was begun rostrally and worked towards the feet. The subjects were instructed to tell if they notice a difference in the strength of sensation on each side of body. Alternating between pin prick and light touch the subjects were tested in following locations. One part of body tested was followed by corresponding part on the other side. The corresponding nerve root for each area tested is indicated in parenthesis.

1. Posterior aspect of shoulders (C4)
2. Lateral aspect of upper arm (C5)
3. Medial aspect of lower arms (T1)
4. Tip of thumb (C6)
5. Tip of middle finger (C7)
6. Tip of little finger (C8)
7. Thorax, nipple level (T5)
8. Thorax, umbilical level (T10)
9. Upper part of upper leg (L2)
10. Lower medial part of upper leg (L3)
11. Medial lower leg (L4)
12. Lateral lower leg (L5)
13. Sole of foot (S1)

In case if any sensory loss was detected, vibration and temperature sensation was tested with tuning fork.

**Position Sense:** Position sense was tested by asking the subjects to keep eyes closed and report if their large toe is up or down, when their toe was moved manually in respective direction by the examiner (self). Same procedure was repeated on opposite side and compared. Toes were held on sides because holding the top or bottom provides pressure cues to patient and makes the test invalid.

Fine touch, position sense (proprioception) and vibration sense are conducted together in dorsal column system. Rough touch, temperature and pain sensation are conducted via spinothalamic tract.³

**Michigan Neuropathy Screening Instrument:** Michigan Neuropathy screening instrument (MNSI) is based on simple tests administered by diabetologists. MNSI score is used by diabetologists as screening tool for diabetic neuropathy, a score of 2.5 or above indicates presence of neuropathy. The patients who had sensory loss were graded according to MNSI.⁴

#### Michigan Neuropathy Screening Instrument Score

<table>
<thead>
<tr>
<th></th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance of feet</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal = 0</td>
<td>Abnormal = 1</td>
<td>Normal = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ulceration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent = 0</td>
<td>Present = 1</td>
<td>Absent = 0</td>
</tr>
<tr>
<td><strong>Ankle reflexes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present = 0</td>
<td>Present/Reinforced. = 0.5</td>
<td>Present = 0</td>
</tr>
<tr>
<td>Absent = 1</td>
<td></td>
<td>Absent = 1</td>
</tr>
<tr>
<td><strong>Vibration perception at great toe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present = 0</td>
<td>Reduced. = 0.5</td>
<td>Present = 0</td>
</tr>
<tr>
<td>Absent = 1</td>
<td></td>
<td>Absent = 1</td>
</tr>
</tbody>
</table>

Maximum score can be 8, a score of 2.5 or more signifies presence of neuropathy. For screening of diabetic peripheral neuropathy, Michigan physical assessment is very useful.⁵
**Statistical Analysis:** The statistical analysis was done using MATLAB® Version7.2. Simple descriptive statistics were evaluated and presented using bar plots, pie charts and stacked bar plots. Descriptive statistics requiring calculation of parameters such as mean, median, percentiles, range and outliers etc. were evaluated and presented using a combination of box and dot plots as well as using One Way Analysis of Variance (ANOVA).

The reason for using a combination of box and dot plots for data representation (as against only showing group means and ± standard deviation SD) is that data on some parameters were not normally distributed (i.e., they did not have a “Gaussian distribution”). Estimates of mean values can be biased if the distributions are non-Gaussian. The number showing ± SD becomes less meaningful as it generally applies to Gaussian distribution. When data are skewed or biased, the box plots are more robust and a better way of understanding the data. However, for general comparison, mean and ± SD for each group is shown with a vertical bar outside of each box. The square marker in the middle of the vertical bar represents the mean value. The extent of the bar on either side of the mean shows ±1 x SD. While differences of median values with 95% confidence can be inferred from the box plots right away, the difference of mean values using One Way ANOVA was evaluated, also at 95% confidence, and shown on separate plots.

**RESULTS**

Fig: 2 given below, shows these scores in a qualitative manner. It can be seen that the score for most individuals was zero in the control and high risk groups. All diabetics have a score of at least 1, while a score of 1.0 or more dominates the other two groups. The subjects with highest scores in our study all belonged to the diabetics group.

Fig: 3 given below, compares the MNSI scores in a quantitative manner between the groups. It can be seen that the median values of Diabetic and MS groups are higher than the control with a significance value of p < 0.05.

For fig 4 given above the horizontal line inside the box represents the median value for the data, i.e., exactly half of the data samples are above this value and half below it. It is also called 50th % ile. The extent of a ‘notch’ around the median represents 95% confidence interval for the median value. The notch and the median are very important statistics for comparison of groups. While comparing any two or more groups, if their notches do not overlap, we can say with 95% confidence that their median values are different from each other. Here we can see that median values for diabetics and MS sufferers are significantly different from controls. For general comparison, mean and ± SD for each group is shown with a vertical bar outside of each box. The square marker in the middle of the vertical bar represents the mean value. The extent of the bar on either side of the mean shows ±1 x SD.

For MNSI scores, discrete values of 0, 0.5, 1, 1.5, 2 and 2.5 are compared with G6PD values as shown in Figure 5 given below.
Figure 5: The score of 1 is fairly distributed along the whole band of G6PD values, with maximum concentration around 7-9. Scores of 2 & 2.5 also correlate with lower activities of G6PD.

DISCUSSION

In our study group the development of neuropathies corresponds with lower values of G6PD. This can be explained in light of findings that diabetes causes inhibition of G6PD activity in experimental animal models. Further, researchers have suggested that increasing G6PD activity can serve as a potential therapeutic target to avoid development of diabetic complications. Around fifty percent people with diabetes develop neuropathies, these ultimately may lead to foot ulcers and amputation. Reactive oxygen species (ROS) play part in causing oxidative stress which leads to diabetic complications. Our findings suggest that G6PD can serve as a therapeutic target to delay or prevent diabetic complications. And lot of suffering, morbidity and health care burden can be avoided However some researchers argue that G6PD derived NADPH is diverted into pathway for producing ROS. If this study is repeated with glutathione ratio and NADPH levels exact role of G6PD may be described.

CONCLUSIONS

1. G6PD activities are decreased in patients with peripheral neuropathies.
2. G6PD may serve as a therapeutic target to delay or prevent development of neuropathies.

REFERENCES

ABSTRACT:
The basic medical sciences are taught in the first two years of medical colleges. Methods used in the teaching of human anatomy like cadaver dissection, microscopy, and imaging techniques have made it easy for the students to grasp the concepts. Learning physiology is also not problematic because they can visualize the phenomenon as they learn. The challenge arises when it comes to the teaching of medical biochemistry. Since it is the study of life at molecular level, it is not easy to envisage everything that is being imparted. With the advent of the information age, there is not only remarkable increase in the degree of advancement in the field of biochemistry and molecular biology, also the teaching methodologies have revolutionized. Following is a brief introduction to the rich list of educational resources that are augmenting the traditional textbook and lecture based approaches across the world. To keep pace with the advancing world we must work towards implementing these into Pakistani medical colleges. The conventional old syllabi should be replaced by these cutting edge techniques and software.

Key words: Biochemistry, Molecular Biology, teaching methods, molecular models, molecular dynamics simulation

INTRODUCTION

As the discipline of biochemistry and molecular biology advances, its teaching approaches also turn out to be more and more challenging. Following is a brief review of the contemporary technologies that are being used today to complement the standard learning practices.

Physical modeling: The goal is to help the medical students understand the fundamental biological processes at molecular level. Traditional approaches of teaching about the molecular machinery of cell are limited to the extent of information that can be conveyed in two dimensions only. Modeling assists in this understanding by providing a perceptible way of telling a story. It allows the students to fully explore the intricacies of protein structure and interactions e.g., cell signaling pathways.

Computer assisted design software (CAD) has helped in the manufacture of three dimensional replicas of proteins and other biomolecules by rapid prototyping technologies. These models which are based on the structural data from protein data bank (PDB) help the students to see and feel the molecules as tactile objects. These models are available in certain model lending libraries as well as online stores of educational supplies.

The MOLYMOD construction kits are an excellent resource in learning about the simpler subunits of biomolecules and construction of polymers. The students can explore the hierarchy of protein structure by using the AMINO ACID STARTER KIT. Toobers are soft, flexible, inexpensive foam plastic rods. The amino acid models are made of synthetic material with imbedded magnets that allow their side chains to be affixed to a toober backbone. The students can understand the effect of mutations on protein folding by means of this kit.

ALPHA HELIX AND BETA SHEET

Construction Kits: are available to educators from the MSOE model lending library. Each kit contains self-assembling amino acid backbone units for alpha helix or beta sheet. The MEMBRANE TRANSPORT COLLECTION KITS help the students explore how different substrates move across the lipid bilayer. This is especially helpful in understanding the filtration system of the kidney and the action potential in muscles.

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Computer modeling: Computer generated images are used synergistically with physical modeling tools to aid in understanding of difficult concepts. In contrast to physical modeling kits, these can be freely accessed online from any part of the world.

JMOL is an excellent resource to study molecular structure and function. JMOL tutorials are freely available. The software can be easily installed in any operating system. The students can examine the molecules in wireframe, alpha carbon backbone, space filled or ribbon diagrams. With the help of mouse, they can actually rotate the molecule and observe its three dimensional structure. It is even possible to highlight specific parts of the molecule by clicking on the menu on the left side of Jmol window. In this way the students can actually probe into the active site of an enzyme and picture its kinetics.1

Most of the textbooks of biochemistry are now accompanied by a CD ROM which contains links to the Jmol images of the molecules. While Jmol is appropriate for use at the undergraduate level, RasMol (a more advanced software which can be used to design your own protein by getting the information from the protein data bank) can be used at the post graduate level.

The protein data bank (PDB) archive: It is a constantly expanding database for understanding the biochemistry of proteins and some other important macromolecules. It is an equally good resource for research as well as education. Structures are available for most of the proteins and nucleic acids involved in processes that are central to life, like ribosomes, oncogenes, drug targets and some pathogenic viruses.2

Virtual genetics lab: Virtual labs have also transformed the teaching approaches. This one is a simulation of transmission genetics and the goal is to help students understand how traits are inherited. Tests of epistasis and complementation can be performed to study gene interactions. In order to make a cross, the students can select male and female parents from any generation and press the cross button. This virtual platform keeps track of the genotypes of the parents and generates their offspring probabilistically. Students can cross hypothetical creatures with up to 2000 offspring for getting statistically significant ratios. It is a user friendly color graphical user interface (GUI) compatible with Mac, UNIX/Linux and PC.3

Other virtual labs: The computer simulated labs have made it possible for the students to learn the principles of sophisticated techniques like DNA extraction, gel electrophoresis, polymerase chain reaction and microarray right from their desktop. The objective is to familiarize the students with experimentation, problem solving, data collection and scientific analysis.

Online learning initiative: Many of the top universities across the world are now offering online courses in many subjects including biochemistry and genetics. Most of these courses are free and come under the category of Massively Open Online Courseware (MOOCs). All you need is a computer and internet access and the leading scholars from the best ranked academia come at your doorstep to teach you.

The gene explorer: This application is an interactive simulation of gene expression. The students can explore a sample gene, appreciate the correspondence between DNA, pre-mRNA, mature mRNA and protein; map the functional elements of a gene and design a gene of their choice and see how it is expressed.

The protein investigator: Molecular visualization software does not allow a student to make hypotheses about interactions between different side chains of amino acids in a protein and how these affect the folding behavior. The protein investigator is designed to help the students test a predictable hypothesis by typing an amino acid sequence and observing its effect on the shape of the protein. It is intended to demonstrate the major principles involved in protein folding like hydrophobicity, charge and hydrogen bonding capacity, and folding of proteins under oxidizing or reducing conditions.

jsMolCalc: It is a molecular editing software which calculates the hydrophobicity and the molecular formula of molecules drawn by the user. It is very simple to use and allows the students to learn about the stereochemistry of biomolecules. The software also presents the user with editing challenges; the objective is to familiarize them with the basics of hydrophobicity and polarity of different functional groups. Once they are acquainted with these concepts it becomes easy for them to comprehend the behavior of lipids in aqueous environment, micelle formation and the basis of lipid bilayers; also the role of amino acid side chains in determining the final conformation of a protein can be better understood.4

Online educational games: Although the process of protein synthesis is reasonably well understood, prediction of its native conformation into a functioning protein is computationally demanding. Released in 2008, “Foldit” is challenging software designed to learn the principles of three dimensional protein folding. It is an online game in which multiple online players are presented with a folding puzzle; each player uses a different strategy to solve the same problem. The data generated in this way is used by the scientists for the "Critical assessment of techniques for protein structure
Emerging Teaching Methodologies in Medical

prediction (CASP)” experiments. So it is serving the purpose of research as well as education as this helps the students to conceptualize protein folding.

This is just a few of the rich list of scholastic resources that are being offered to the educators as well as independent learners of biochemistry and molecular biology. Most of the online resources are freely accessible. This article is anticipated to inform the medical students about the advantages of the information age that they are living in and how they can truly benefit from it and understand the basis of molecular medicine.

CONCLUSION

In Pakistani medical colleges, biochemistry and molecular biology is portrayed as a boring and dull subject. Learning of anatomy and physiology is overstressed, while biochemistry is usually considered as an aggregate of inconceivable facts that can be crammed just before exams. That is the reason why the students usually feel lost and are easily misled to study poorly illustrated substandard books which further drops their interest in the subject. Biochemistry lies at the foundation of the revolutionary research which is going on in molecular medicine. We are living in the beginning of an era when it has become possible to edit the individual genes in a person’s genome. The precise biochemical basis of previously untreatable disorders is unfolding. Drugs are being designed to target specific proteins. If we want our medical graduates to play a role in the future of molecular medicine, we must radically improve the curriculum as well as the training approaches in the field of medical biochemistry and molecular biology.

- In medical colleges biochemistry should be the most important major subject, as all the research is taking place at molecular level.
- It is important that we provide our students with a strong base of molecular level so that they can take leading roles in research.
- All available techniques, resources, kits and software should be utilized by teaching faculty to help students understand molecular basis of life. Only then we can emerge as a leading nation.

REFERENCES


APRIL’2014 SPECIAL EDITION OF OPHTHALMOLOGY UPDATE ON RETINOBLASTOMA

The next April’ 2014 issue of Ophthalmology Update will be a special edition on ‘Retinoblastoma’ including deliberations of the Symposium on Retinoblastoma recently held at Shaukat Khanum Memorial Hospital & Research Centre Lahore.

Those who are interested to contribute their articles on the subject may please send their papers/review articles by 15th March’2014.
Open Heamorrhoidectomy under Local Anaesthesia

Yousaf Jan FCPS (General Surgery), Aurangzeb Khan MBBS, Waqas MBBS, Ahmad Din MBBS

ABSTRACT

Objective: Haemorrhoids are engorged vascular cushions found within the submucosa of the anal canal. They consist of a sacculated venous plexus with a rich arterial supply supported by a fibromuscular connective tissue. The exact prevalence is unknown as many peoples do not seek medical attention; however, it may be somewhere in the region of 4-36% depending on population. The incidence is higher in Western populations and is low in sub-Saharan Africa. They normally contribute to the anal continence and protection of the sphincter mechanism during defection and are found at constant positions within the anal canal (3, 7 and 11 o’clock positions). The objective of my study is to assess the feasibility and tolerability of open haemorrhoidectomy under local anesthesia.

Materials and Methods: This study was conducted in general surgery ward Hayatabad Medical Complex Peshawar after taking permission from research and ethical committee of the hospital. Through a prospective cross sectional study design, 65 patients were included in the study between March 2009 to March 2010. All patients underwent open haemorrhoidectomy by the same surgeon having more than five years experience. Both males and females were included in the study. Follow up was done after the surgery and the data were collected.

Results: 65 patients with 3rd and 4th degree hemorrhoids underwent open haemorrhoidectomy under local anesthesia and including both male and female patients. The mean age was 44.4 ± 12.2 SD (21-72). Mean operating time was 20.7 min ± (9.9SD) (5-60min) SD. Only 5 patients (7%) had severe pain which needed general or spinal anesthesia.

Conclusion: Hemorrhoidectomy under local anesthesia is feasible, effective, well tolerated and safe method in all age groups. It should be an alternative approach in treatment of haemorrhoidal disease who are unwilling or unfit for other forms of anesthesia.

Key Words: Open hemorrhoidectomy, local anesthesia (LA).

INTRODUCTION

Hemorrhoids are dilatation of internal venous plexus with an enlarged, displaced anal cushions. It is believed to be one of the most widely spread human suffering ranking first among diseases of the rectum and large gut.

Symptoms resulting from hemorrhoids are commonly bright red bleeding per rectum, mucosal prolapse or protrusion, pruritus ani. Pain is not characteristic unless there has been thrombosis or strangulation of the hemorrhoids which possibly can lead to gangrene. The incidence of symptomatic hemorrhoids could be as high as 36.4%.

There are many treatment options available depending on the degree of haemorrhoidal disease. Nevertheless the best treatment is prevention by avoiding constipation, intake of high fiber diet, adequate fluids and administration of bulk laxatives.

In most instances haemorrhoids are treated conservatively. Hemorrhoidectomy is indicated when conservative management have failed or complications have occured. Hemorrhoidectomy is usually performed under general or spinal anesthesia, the complications resulting from anesthesia can hide a successful operation. Surgeries done under LA have some important advantages, like early ambulation and subsequent discharge from hospital, reduction in total cost of the procedure and it encourages doctor patients interaction during the procedure. Low total cost of the procedure and assurance of being awake during the procedure enhanced our patients acceptability of surgery.

MATERIAL AND METHODS

This study was conducted in general surgery ward Hayatabad Medical Complex Peshawar from March 2009 to March 2010 including 65 patients after taking permission from the local research and ethical committee. Patients who presented with 3rd & 4th degree haemorrhoids and consented for haemorrhoidectomy under local anesthesia were recruited into the study.

A patient would be excluded from the present study for one of the following reasons: allergic to local anesthetic agents (on history), consent refusal, antiplatelet drug or anti-coagulant usage, with bladder outlets obstruction, previous anorectal surgery, colorectal tumors and others anorectal disorders (on history and examination).

A detailed history was taken from all patients. A part from general physical and systemic examination, local examination including inspection, digital rectal examination and proctoscopy was performed. Flexible
Open Heamorrhoidectomy under Local Anaesthesia

sigmoidoscopy and colonoscopy were performed in patients above 40 years with history of recurrent bleeding per rectum to rule out other anorectal pathologies. Pre-operatively all patients had the following investigations, complete blood count (CBC), blood grouping and Rh factor, random blood sugar (RBS), Liver function tests (LFT), serum creatinine, coagulation profile, X-ray chest and ECG if the patient above 35 years or history of cardiac problem. All patients were given phosphate enema at least 3 hours before operation.

Informed consent were taken from all patients. Before starting operation I/V line and pulse oximetry monitoring were maintained but no intravenous fluids administered, except single dose of 1 gm ceftriaxone and single 100 ml Flagyl infusion were given, as the patient was put in lithotomy position. A 40 ml local anesthetic mixture was prepared using 10 ml of 0.5% bupivacaine, 10 ml of 1% lidocaine with adrenaline 1:10000 and 20 ml of distilled water. A 30 ml of this solution was infiltrated by the surgeon into the left/right anterolateral aspect of perianal region, the remaining 5-10 ml was infiltrated into the submucosal area beneath the internal haemorrhoids, and all patients underwent open haemorrhoidectomy. Intraoperatively pain assessment was done using visual analogue score. Six Patients (7%) could not tolerate local anesthesia were converted to general anaesthesia.

At the end of surgery, the anal canal was packed with lignocaine gel impregnated guaze for haemostasis and some analgesia. All patients were evaluated postoperatively for pain assessment at 30 min, 90min, 6h and 24 h through visual analogue scoring system. Further postoperative analgesic was achieved by use of intravenous ketorolac 30 mg SOS for the first 24 hours, and all patients were placed on perioperative metronidazole for 24 hours. Postoperative analgesia was classified as excellent if no analgesia was needed, satisfactory if one dose was required, and poor if two or more doses were needed. Anal pack was removed and patient discharged on 1st post op day and advised warm sit-bath twice daily and after each defeation, oral NSAIDs, oral ciprofloxacin 500 mg plus metronidazole, 5% lignocaine ointment and laxatives for 5 days postoperatively.

RESULTS
A total of 65 patients with 55(84%) males and 10(16%) females were included in the study. Age range was 21-72 years with mean age of 44.4 years ± 12.2 SD as in table 1. Out of 65 patients, 45 (69%) had 3rd degree haemorrhoids and 20 (31%) had 4th degree haemorrhoids as in table 2. In this study 47 patients(72.3%) had experienced no pain during the procedure. 10 patients (15.3%) had mild intraoperative pain (VAS 1-4) and only 5 patients (7.7%) had severe pain which needed additional anesthesia in the form of GA or spinal as shown in table 3.

The mean operating time was 20.7 min ± (9.9 SD). Only 3 patients(4.6%) had bleeding on 1st post operative day, but only one needed re-surgery for bleeding control, and 2 patients (3.07%) went into urinary retention needed catheterization as shown in table 4. No mortality was noted in the study group.

**TABLE 1: Age range**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Sex</th>
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<tbody>
<tr>
<td>21-30</td>
<td>8</td>
</tr>
<tr>
<td>31-40</td>
<td>15</td>
</tr>
<tr>
<td>41-50</td>
<td>20</td>
</tr>
<tr>
<td>51-60</td>
<td>15</td>
</tr>
<tr>
<td>61-70</td>
<td>7</td>
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</tbody>
</table>

**TABLE 2: Degree of hemorrhoids**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Frequency/Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd</td>
<td>45 (69%)</td>
</tr>
<tr>
<td>4th</td>
<td>20 (31%)</td>
</tr>
<tr>
<td>Total</td>
<td>65 (100%)</td>
</tr>
</tbody>
</table>

**TABLE 3: Intra operative pain assessment, Visual analogue score (P value = 0.010)**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Frequency/Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No pain 47 (72.3%)</td>
</tr>
<tr>
<td>1-4</td>
<td>Mild 10 (15.38%)</td>
</tr>
<tr>
<td>5-7</td>
<td>Moderate 3 (4.61%)</td>
</tr>
<tr>
<td>8-10</td>
<td>Severe (converted to GA) 5 (7.7% )</td>
</tr>
<tr>
<td>Total</td>
<td>65 (100%)</td>
</tr>
</tbody>
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DISCUSSION
Haemorrhoidectomy involves surgery on sensitive anoderm, which is rich in nerve endings. Several ways of reducing pain and discomfort have been proposed, including the use of multimodal analgesics, restricted surgery to one hemorrhoid at a time, avoiding a closed technique, rectal metronidazole application, pre-emptive analgesia, caudal block, preoperative lactulose, pudendal perineal blocks, stapled anopexy and Doppler guided hemorrhoid artery ligation.

Local anesthesia was first introduced to surgical procedure done for hemmorhoids with the aim of controlling pain which usually complicate the procedure. Subsequently it was considered that the procedure can be done completely under LA. Surgeries done under LA have some important advantages, like early ambulation and subsequent discharge from hospital, reduction in total cost of the procedure and it encourages doctor patients interaction during the procedure.31

All these advantages are much more relevant in our environments where most of the patients belong to low socio-economic status. Caudal or spinal anesthesia can be used but they require a trained anesthesiologist and can create numerous known complications34. For patients with hemorrhoids unwilling or unfit for other forms of anesthesia, ring block with LA may be employed with good results and patient tolerance.

Some recent studies had shown that adequate pain
control can be achieved with the use of local anesthesia when patients are medically fit and psychologically prepared for the procedure.15-16

Pain is the most common complication of hemorrhoidectomy. C. W. Sobrado17 regards pain to be the most common disturbance, complicating postoperative period of anorectal surgery. Local anesthesia with perianal and anal canal blocks gives adequate duration and depth of anesthesia and results in excellent relaxation of the anal canal.18 A short acting local anesthetic lidocaine provides excellent initial pain relief and long acting local anesthetics bupivacaine provides several hours of anesthesia post operatively. The presence of adrenaline in the lidocaine provides enough time for not only haemorrhoidectomy but also helpful to reduce intraoperative bleeding.19

One randomized controlled study,20 comparing haemorrhoidectomy under local versus general anesthesia showed statistically similar pain scores for patients in both groups. In another study by Imbelloni and colleagues,21 also showed better pain relief during the first 24 hours after surgery under local anesthesia for haemorrhoidectomy, as also shown in our study.

In a study by Nystrom and his colleagues,22 showed that the perianal block is easy to apply and effective as a sole method of anesthesia for proctological operations including haemorrhoidectomy.

Intraoperative pain assessment by visual analogue score during haemorrhoidectomy in our study showed that 47 patients (72.3%) out of 65 patients had surgery completed without any pain, while only 5 patients (7%) had severe pain during procedure needed completion of surgery under general anesthesia as shown in table 3. Postoperative analgesia assessment was done for 24 hours and was classified as excellent if no analgesia was needed, satisfactory if one dose was required, and poor if two or more doses were needed. Our result showed that postoperative analgesia was excellent in 54 patients (83%), satisfactory in 7 patients (10.7%) and poor in 4 patients (6.1%).

Postoperative complications were assessed for first 24 hours in our study including bleeding and urinary retention. Only 3 patients (4.6%) had bleeding on 1st post operative day, but only one needed re-surgery for bleeding control, and only 2 patients (3.07%) went into urinary retention needed catheterization.

Preoperative counseling and adequate information about the expected postoperative course after haemorrhoidectomy under local anesthesia is essential for a successful outcome. It is hoped that this work though with a small number of patients may prompt more surgeons to offer local anesthesia to patients undergoing hemorrhoidectomy, as this may encourage early presentation to hospital.

CONCLUSION

In our conclusion, hemorrhoidectomy under LA block is convenient, effective, safe and acceptable to most patients of all age with fewer complications, which supports the routine use of local anesthesia for haemorrhoidectomy. This can be used in those patients who are unwilling or unfit for other forms of anesthesia and should be on alternative approach in the treatment of haemorrhoides disease.

REFERENCES

ABSTRACT

Objectives: To determine the frequency of Achilles’ tendon tenotomy in Ponseti technique for idiopathic clubfoot.

Club foot is one of the most common congenital deformities affecting about one infant in every 750 births. Some equinovarus deformity after Ponseti technique application requires Achilles’ tenotomy and tenotomy of the Achilles tendon is an integral part of the Ponseti technique of clubfoot correction.

Study Design: This study was conducted on 70 patients with club foot deformity from September 2009 to 2010. Patient’s foot was scored according to pirani scoring system and then Ponseti protocol of manipulation and casting was followed. This process continued weekly up to fourth cast and at fifth visit, the uncorrected equinovarus was corrected by percutaneous Achilles’ tenotomy under local anaesthesia cast applied for three weeks. Improvement in the score was noted. Data was analyzed by SPSS version 10.0.

Results: There were 43 (61.4%) males and 27 (38.6%) females. Achilles’ tenotomy was done in 43 (61.4%) patients for the correction of equinovarus. Achilles’ tenotomy was done in 30 (69.77%) males and 13 (30.23%) females. Tenotomy in the age group of 5-8 months was 29 (67.44%) and in the age group of 1-4 months was 14 (32.56%). There were 27 (38.57%) and 43 (61.43%) patients with bilateral and unilateral CTEV patients respectively and tenotomy was done in 15 (34.88%) and 28 (65.11%) patients in bilateral and unilateral CTEV patients respectively.

Conclusion: Achilles’ tenotomy is quite common in our setup while treating patients with CTEV up to 8 months of age by Ponseti technique of manipulation and serial casting.

Key Words: Congenital talipes equinovarus, Ponseti technique, Achilles’ tenotomy.

INTRODUCTION

Idiopathic clubfoot is the most common musculoskeletal birth defect affecting an average of 1 in 750 newborn.1 The deformity has four components namely cavus of the midfoot, adductus of the forefoot, varus of the hind foot and equinovarus.2 Pirani scoring system is used for assessment of severity of clubfoot deformity and its response to treatment.3

Treatment of clubfoot with the Ponseti method is successful when performed immediately after birth,4 but this technique is reported to be effective in children up to two years of age even after previous unsuccessful non-surgical treatment.5 The success rate with Ponseti method has been reported 93%.6

The Ponseti method is safe and effective treatment for congenital idiopathic clubfoot and radically decreases the need for extensive corrective surgery.7 It is reported to provide a lower complication rate, less pain and better function as the patient ages as compared to operative treatment.8 Correction of the deformity is in the order of Cave; cavus is corrected first followed by adductus, varus and equinovarus at last. At this point there is often a residual equinovarus which requires percutaneous Achilles’ tenotomy.9

Ponseti casting has proven successful in reducing the number of patients requiring extensive surgical releases and as a result become integral part of paediatric orthopaedic practice.10 However, some equinovarus deformity is left which requires Achilles’ tenotomy11 and percutaneous tenotomy of the Achilles tendon is an integral part of the Ponseti technique of clubfoot correction.12 Ponseti clubfoot management requires percutaneous tenotomy in 70-91% of cases, typically with local anaesthesia by low dose of lidocaine as recommended by Ponseti but it can be performed under general anaesthesia as well.13

In our setup, majority of patients with congenital clubfoot deformity from outpatient department are treated by Ponseti treatment, but the local statistics of Achilles’ tenotomy in this type of treatment are not known. Also parents and family members of patients can’t be clearly counseled without knowing local frequency of tenotomy and the end result is that in case of tenotomy, the procedure might be more stressful for the infant, the surgeon and the parents or family members.

MATERIAL AND METHODS

This descriptive cross sectional study was conducted in Department of Orthopedics and Traumatology, Khyber Teaching Hospital, Peshawar from September
In the management of clubfoot, a trend over the last decade has been a movement away from extensive soft-tissue release surgery for definitive clubfoot management and toward less invasive strategies focused more on manipulation and castings.14

In our study a total of 70 patients with clubfeet were included. Among these 43(61.4%) were males while 27(38.6%) were female. Twenty seven (38.6%) were bilateral club feet and 43(61.4%) were unilateral clubfeet.

A study of Royal College of Surgeon reported 38 male and 12 female of clubfoot with bilateral involvement in 27 patients.15 A local study has reported 30% patients with bilateral deformity, 12.5% males and 17.5% females16. Our results are in accordance to other studies showing predominance of male gender and unilateral involvement of CTEV.

Achilles, tenotomy was done in 43(61.4%) patients for the correction of equinovarus while 27(38.6) patients achieved corrected foot with Ponseti casting without tenotomy in our study. With the exception of tenotomy, no other surgical procedure was done in our study to correct the deformities. Tenotomies were performed

### RESULTS

There were 70 patients comprising of 43 (61.4%) males and 27 (38.6%) females. The mean, mode and median for the age were 4.73 months, 5 months and 5.00 months respectively. The minimum age was 1 month while the maximum age was 8 months.

Achilles' tenotomy was done in 43 (61.4%) patients for the correction of equinovarus. (Table No. 1). Gender distribution of Achilles' tenotomy was 30 (69.77%) males and 13 (30.23%) females while the tenotomy was done maximum in the age group of 5-8 months i.e. 29 (67.44%) followed by the age group of 1-4 months (14 (32.56%)). (Table No. 2)

There were 27 (38.57%) and 43 (61.43%) patients with bilateral and unilateral CTEV patients respectively and tenotomy was done in 15 (34.88%) and 28 (65.11%) patients in bilateral and unilateral CTEV patients respectively. Detail is shown in Table No. 3

### Table No. 1 Achilles' tenotomy in CTEV treated by Ponseti method

<table>
<thead>
<tr>
<th>Achilles' Tenotomy</th>
<th>Frequency n(%)</th>
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<tbody>
<tr>
<td>Yes</td>
<td>43 (61.4%)</td>
</tr>
<tr>
<td>No</td>
<td>27 (38.56%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (100%)</td>
</tr>
</tbody>
</table>

n= number of observed patients, %=Percentage

### Table No. 2 Achilles' tenotomy in CTEV treated by Ponseti method according to gender and age

<table>
<thead>
<tr>
<th>Gender wise distribution</th>
<th>Achilles' tenotomy n(%)</th>
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<tr>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>N=43 (61.4%)</td>
<td>30 (69.77%)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>N=27 (38.6%)</td>
<td>13 (30.23%)</td>
</tr>
</tbody>
</table>

Age wise distribution

<table>
<thead>
<tr>
<th>Age wise distribution</th>
<th>Achilles' tenotomy n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4 months</td>
<td>14 (32.56%)</td>
</tr>
<tr>
<td>5-8 months</td>
<td>29 (67.44%)</td>
</tr>
</tbody>
</table>

N= Total number of patients, n= number of observed patients, %=Percentage

### Table No. 3: Achilles' tenotomy in CTEV treated by Ponseti method according to gender and age

<table>
<thead>
<tr>
<th></th>
<th>Right foot n(%)</th>
<th>Left foot n(%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral CTEV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=27 (38.57%)</td>
<td>20 (46.51%)</td>
<td>8 (18.60%)</td>
<td>28 (65.11%)</td>
</tr>
<tr>
<td>Bilateral CTEV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=43 (61.43%)</td>
<td>10 (23.26%)</td>
<td>5 (11.62%)</td>
<td>15 (34.88%)</td>
</tr>
</tbody>
</table>

N= Total number of patients, n= number of observed patients, %=Percentage

### DISCUSSION

In the management of clubfoot, a trend over the last decade has been a movement away from extensive soft-tissue release surgery for definitive clubfoot management and toward less invasive strategies focused more on manipulation and castings.14

In our study a total of 70 patients with clubfeet were included. Among these 43(61.4%) were males while 27(38.6%) were female. Twenty seven (38.6%) were bilateral club feet and 43(61.4%) were unilateral clubfeet.

A study of Royal College of Surgeon reported 38 male and 12 female of clubfoot with bilateral involvement in 27 patients.15 A local study has reported 30% patients with bilateral deformity, 12.5% males and 17.5% females16. Our results are in accordance to other studies showing predominance of male gender and unilateral involvement of CTEV.

Achilles, tenotomy was done in 43(61.4%) patients for the correction of equinovarus while 27(38.6) patients achieved corrected foot with Ponseti casting without tenotomy in our study. With the exception of tenotomy, no other surgical procedure was done in our study to correct the deformities. Tenotomies were performed
Frequency of Achilles’ Tenotomy in Club Foot treated by Ponseti Method

on 55 of the 71 feet or 77.5% in Elshenawy EM et al,17 while Bor N et al,18 documented that twenty-four (32%) babies underwent additional surgical procedures other than tenotomy, including 21% who underwent tibialis anterior tendon transfer in their study. Kampa R,19 recorded Achilles’ tenotomy in 46% of his patients, while Abbas M et al,20 recorded a percutaneous tenotomy in 96% of patients and a repeat tenotomy was required in 5% of patients because of inability to get a satisfactory amount of dorsiflexion after the first tenotomy in their study. Gupta A et al,21 did tenotomy in 146 feet (95%) and most of these had Pirani scores of more than 5.

Niki H et al,22 investigated the issue of negative effect of Achilles tenotomy on clubfoot associated calf-muscle atrophy by ultrasonographic examination and found that Achilles tenotomy had no significant negative short-term effects on calf-muscle atrophy associated with clubfoot. Parada SA, et al,23 has advocated that percutaneous tendoachilles tenotomy under general anesthesia offers the potential advantages of better pain control, the ability to perform the procedure in a more controlled manner, and the possibility of lessening the pain response of the infant and nearly all patients can be discharged on the day of surgery. Dogan A, et al,24 has advocated that that direct visualizing of the tendon with mini-open incision may reduce the risk of neurovascular injury, especially for surgeons who are not experienced. Label E, et al,25 evaluated the safety of this practice for the treatment of clubfoot when performed as an “office procedure” without sedation or general anesthesia during the final stage of the serial casting protocol by retrospectively collecting data. They found that tenotomy as an office procedure using topical and local anesthesia is a safe procedure; do not incur a substantial rate of readmission to the emergency room. We also done percutaneous Achilles’ tenotomy under local anesthesia using diluted 2% lignocaine and encountered no complications stated above by other authors.

The limitations of our study were a small number of patients, wide range of their age and short follow-up period. We also didn’t study the long term effects of tenotomies on calf-muscle size and power. Further research should be undertaken to document the affects of tenotomies on calf-muscle with similar groups and the incidence of associated neurovascular complications.

CONCLUSION

Achilles’ tenotomy is quite common in our set up while treating patients with CTEV up to 8 months of age by Ponseti technique of manipulation and serial casting. It must be fully discussed with the parents of child with CTEV before starting Ponseti technique of manipulation and serial casting for CTEV.

REFERENCES

INTRODUCTION

Gut anastomosis is one of the most commonly performed surgeries in both emergency and elective cases like traumatic rupture of gut, benign or malignant perforation or obstruction and in certain other inflammatory conditions. After surgical procedure, the loss or reduction of motility in the gut is common and this transient condition lasts from a few hours to few days and is inappropriately called paralytic ileus, nondynamic ileus or even post-operative ileus (PI). It is characterized by abdominal distention, absence or reduction of bowel sounds (BS); failure to pass flatus and open bowels; nausea and vomiting; and abdominal pain.

A ‘nil by mouth’ (NBM) approach after gut anastomosis surgery has been well known for many years due to transient paralytic ileus. Early enteral nutrition (EN) has become very popular and received increasing attention in recent years. Many prospective randomized trials performed in recent years evaluating the effects of nasogastric intubation have suggested that it may be unnecessary, itself delaying passage of flatus and bowel movements as well as lengthening the duration of hospital stay. There is no universal answer to the question of how much early enteral feeding is safe? The complications of early and delayed enteral feeding have been reported with controversies. Some claims that early enteral feeding has better results than delayed enteral feeding in terms of wound and respiratory infections, hospital stay, mortality and vice versa. Ahmet Dag, et al has reported the superiority of early enteral feeding and observed that the rate of wound infection (5.05% vs. 7.00%), Mean hospital stay (5.55 VS. 9.0) and anastomotic leakage (2.02% vs 6.00%) were less in the early feeding group. On the other hand, Chatterjee S, et al has showed that in early feeding group the rate of nausea and vomiting (20% vs 13.33%), wound infection and dehiscence (25% vs 13.33%), respiratory tract infection (16.67% vs 8.33%) anastomotic leakage (13.33% vs 5%) and mortality (6.67% vs 1.67%) was more than delayed enteral feeding group.

The current study was designed to determine the effectiveness of early and delayed enteral feeding for patients undergoing elective intestinal anastomosis in our local population.

MATERIAL AND METHODS

This comparative study was carried out at Department of General Surgery, Khyber Teaching Hospital, Peshawar, KPK from January to December, 2012 recruiting 28 patients in each group by consecutive non probability sampling. The inclusion criteria adopted was; patients between 13 and 60 years of either gender who underwent intestinal anastomosis for Ileostomy closure and Ileocolic anastomosis. The exclusion criteria was; all the emergency cases in which signs of peri-

ABSTRACT

Objective: The objective of this study was to know the effectiveness of early versus conventional delayed enteral feeding in intestinal anastomosis in terms of anastomotic leak.

Materials and Methods: 28 patients in each group were included in study to compare the effectiveness of early enteral feeding (Group A) and conventional enteral feeding (Group B) for intestinal anastomosis in terms of anastomotic leak on 5th postoperative day. Data was entered in software SPSS version 10.0. T test was applied to compare the effectiveness of both groups keeping p value ≤ 0.05 as significant.

Results: The mean ages of group A and B patients were 36.8 years + 10.2SD and 37.1 years + 25.0SD (P value = 0.9036). In group A, Ileostomy closure was done in 15 (53.57%) and ileocolic anastomosis was done in 13 (46.43%) patients. In group B, Ileostomy closure was performed in 19 (67.86%) patients and ileocolic anastomosis was done in 9 (32.14%) patients. (P value = 0.412). In group A, the intestinal anastomotic leak was observed in 1 (3.57%) patients and in group B with delayed enteral feeding, it was noted in 9 (32.14%) patients (P=0.012).

Conclusion: The early feeding in patients with intestinal anastomosis is tolerable, as significantly small number of patients developed leak as compared to conventional group.

Key Words: Intestinal Anastomosis; Early feeding; Conventional feeding; Anastomotic Leak.
Comparative Effectiveness of Early vs Delayed Oral Feeding after Elective Intestinal Anastomosis

Tontitis were present like abdominal distension, pain abdomen, fever, absent bowel sounds, Diabetes mellitus, uremia and malignancy, those who were using steroids and anemic patients. All the above conditions could alter the healing process of anastomosis, acting as confounders and hence they were excluded from the study.

The patients were admitted through OPD. The purpose of the study was explained to the patients. Informed written consent was taken from those who agreed to participate in the study. History, clinical examination and routine pre-op investigations (FBC, Blood urea/Sugar, serum creatinine, serum electrolytes, urine R/E, ECG) and distal loopogram were performed and the names of patients were put on the next elective operation theater (OT) list. In all patients, single layer interrupted intestinal anastomosis with 2/0 vicryl was done. Patient in group A received early enteral feeding after 24 hours starting from clear fluid sips. On tolerating the fluid they were started on free fluids, semi solid food and then solid food gradually. Patients in group B were kept nothing by mouth and nasogastric tube (NGT) was placed immediately postoperatively for 72 hours. They were started on enteral feeding after removing the NGT when the output was less than 50-100 ml/day after 72 hours and there was no paralytic ileus and when bowel sounds were audible. The patients were gradually shifted from liquid to semisolid and then to solid normal diet. Anastomotic leak was diagnosed clinically by the presence of all of the signs and symptoms of abdominal pain, raised pulse (>100/minutes) and temperature (>100°F), abdominal tenderness and absent bowel sounds and leak apparent on gastrointestinal contrast study (Barium follow through) or gut contents, either discharging from the wound or the anastomotic site (on re exploration). In both group injection Ceftriaxone 1gm and infusion Metronidazole 500ml was given at the time of anesthesia induction and then post operatively, Ceftriaxone 1gm was given 12 hourly and infusion Matrinadazole 500ml was given 8 hourly intravenously. Standard protocols of aseptic techniques were practiced while doing intestinal anastomosis in both groups. After anastomosis, skin was closed with prolene 2/0 by interrupted suture technique. All the surgeries were performed by an experience surgical team. A closed system of drainage was applied, needed for hematoma prevention intraperitoneally. N/G tube was kept for 24 hours in both groups.

Post operative patients were assessed for signs of intestinal leak; 12 hourly and information about the anastomosis was recorded on pre designed proforma up to the 5th post operative day. The patients were discharged on 6th postoperative day if indicated. Exclusion criteria was strictly followed to control confounders and bias in the study results.

The data was analyzed in SPSS version 10.0. Percentages and frequencies were calculated for categorical variables like gender and procedure effectiveness while mean and standard deviation were calculated for numeric variables like age. Results were presented in the form of tables and graphs. P value < 0.05 was considered significant.

RESULTS

Total number of patients in each group was 28: 20 (71.42%) males and 8 (28.57%) females in Group A and 18 (64.29%) males and 10 (35.71%) females in group B (P value = 0.775) (Graph no 1). The mean ages of group A and B patients were 36.8 years ± 10.2SD and 37.1 years ± 25.0SD (P value = 0.9036).

In group A, Ileostomy closure was done in 15 (53.57%) and ileocolic anastomosis was done in 13 (46.43%) patients. In group B, Ileostomy closure was performed in 19 (67.86%) patients and ileocolic anastomosis was done in 9 (32.14%) patients. (P value = 0.412) (Graph no. 2)

In group A, the intestinal anastomotic leak was observed in 1 (3.57%) patients and in group B with delayed enteral feeding, it was noted in 9 (32.14%) patients. The P value was statistically significant; 0.012. (Table 1). The only single case of intestinal anastomosis leak in group A was observed in patient with ileocolic anastomosis while in group B, intestinal leak was noted in 2 (7.14%) patients with ileostomy closure and 7 (25.00%) patients of ileocolic anastomosis. (Table No. 2). Age and gender distribution is shown in detail in table no. 2.

Graph 1: Gender distribution of patients in group A (early enteral feeding) & B (delayed enteral feeding) after elective intestinal anastomosis
Comparative Effectiveness of Early vs Delayed Oral Feeding after Elective Intestinal Anastomosis

Graph-2: Procedures done in patients with intestinal anastomosis – group A (early enteral feeding) & B (delayed enteral feeding) after elective intestinal anastomosis

P value = 0.412

Table-1: Intestinal anastomosis leakage in group A (early enteral feeding) & B (delayed enteral feeding) after elective intestinal anastomosis

<table>
<thead>
<tr>
<th>Intestinal Leakage</th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1 (3.57%)</td>
<td>9 (32.14%)</td>
<td>0.012</td>
</tr>
<tr>
<td>No</td>
<td>27 (96.43%)</td>
<td>19 (67.86%)</td>
<td></td>
</tr>
</tbody>
</table>

Table-2: Intestinal anastomosis leakage in group A (early enteral feeding) & B (delayed enteral feeding) according to type of procedure, gender and age groups after elective intestinal anastomosis

<table>
<thead>
<tr>
<th>Intestinal Leakage</th>
<th>Group A</th>
<th>Group B</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ileostomy closure</td>
<td>0 (0%)</td>
<td>2 (7.14%)</td>
<td>1.000</td>
</tr>
<tr>
<td>Ileocolic anastomosis</td>
<td>1 (3.57%)</td>
<td>7 (25.00%)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0 (0%)</td>
<td>4 (14.29%)</td>
<td>1.000</td>
</tr>
<tr>
<td>Female</td>
<td>1 (3.57%)</td>
<td>5 (17.86%)</td>
<td></td>
</tr>
<tr>
<td>Age groups (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-30</td>
<td>0 (0%)</td>
<td>1 (3.57%)</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>0 (0%)</td>
<td>1 (3.57%)</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>0 (0%)</td>
<td>3 (10.71%)</td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>1 (3.57%)</td>
<td>4 (14.29%)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

DISCUSSION

Intestinal anastomosis is frequently performed as an emergency and elective procedure due to traumatic rupture, benign or malignant perforation or obstruction and in certain other inflammatory conditions. As a conventional practice after gut anastomosis, patients are kept “nothing by mouth” till bowel sounds return. During this time period, patient remains with nasogastric tube for decompression of stomach and providing rest to the gut. As Adequate nutrition has always been a major goal in postoperative care and early oral intake has also been suggested to reduce sepsis risk because of decreased bacterial colonization and decreased translocation through defects in the bowel mucosa into the blood circulation. our this study was based on the fact that wound healing as well as anastomotic strength improves in patients of early oral feeding and the concept of withholding oral intake postoperatively does not seem to be reasonable.11

In our study, intestinal anastomotic leak was observed in 1 (3.57%) patients in early feeding group. This only single case of intestinal anastomosis was with ileocolic anastomosis. In patients with delayed enteral feeding, 9 (32.14%) patients developed anastomosis leak; 3 with ileostomy closure and 7 patients of ileocolic anastomosis. (P = 0.012). Roy A et al,12 studied the early oral feeding early enteral feeding by giving clear water 18 hours after gut anastomosis in 51 patients. They found that only 3 patients (5.88%) of 51 developed clinical evidence of anastomotic leakage. One out of these three died due to electrolyte imbalance. In our study, only one patient in group B died due to sepsis and DIC. All the patients of both groups showing clinical evidence of intestinal leak were re-explored and repeat ileostomy were done. Similarly Thapa pb et al,13 reported only one patient with anastomotic leak in early feeding group and in the control group 2 patients. Also return of bowel sounds, lesser episodes of vomiting, shorter hospital stay postoperatively were better in the early feeding group compared with conventional feeding group.

On the other hand some researchers10 have claimed that conventional enteral feeding has significantly low anastomotic leakage (5%), as compared to early feeding group (13.33%) (p = 0.206). Some claim that both methods of enteral feeding has same effects regarding abdominal diameter, bowel sounds, flatulence and bowel opening, presence or absence of abdominal pain, nausea and/or vomiting. Patients in both the test group and the control group did not show any difference as to the period of hospital stay, recovery time of postoperative ileus and diet tolerance. some authors advocate that ‘nothing by mouth’ and gastric decompression prevent postoperative nausea and vomiting and protect the anastomosis, allowing time to heal before being stressed by food. Results of our study were against this concept. Also, there is no evidence that bowel rest and ‘nothing by mouth’ are beneficial for healing of wounds and anastomotic integrity. Indeed, the evidence is that luminal nutrition may enhance wound healing and increase anastomotic strength, with reduction in perioperative infection, better maintenance of nitrogen balance and shorter hospital stay.15,16,17,18,19

The method of early feeding after intestinal anastomosis is more economical in terms of hospital stay, cost of treatment and rehabilitation. These parameters are of great significance in our setting as reduced post-
Comparative Effectiveness of Early vs Delayed Oral Feeding after Elective Intestinal Anastomosis

operative stay may be beneficial for the patient psychologically. Our study was limited by the small sample size as we included only 28 patients in each group. Perhaps the use of a larger sample would enable and encourages to see the positive effects of the study in a more comprehensive manner.

The other limitations of the study were; we did not assess the long term effects of early feeding such as wound infection and intra-abdominal sepsis. Although the data are significantly clear to conclude that early enteral feeding is of proved benefit in terms of anastomotic leak, we understand the need of further extended studies to clarify the issue of early feeding in intestinal anastomosis.

CONCLUSION
The findings in the present study in terms of anastomotic leakage conclude that early feeding in patients with intestinal anastomosis is tolerable, as significantly small number of patients developed leak as compared to conventional group.

REFERENCES

IMPORTANT NOTE:
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<thead>
<tr>
<th>SR #</th>
<th>Name</th>
<th>Area</th>
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<td>Syed Arshad Ali</td>
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<td>6</td>
<td>Khalid Mehmood</td>
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ABSTRACT
Objective: Clean wounds are defined as elective, non-emergency, non-traumatic, made under sterile aseptic surgical condition and in which respiratory, gastrointestinal, genitourinary tracts are not entered. Post-operative complications of wounds can be divided into early, intermediate and late. Early complications are those that occur within 30 days of operation. To determine the frequency and common factors leading to early non-infectious wound complications after clean incised surgical wounds for inguinal hernia repair.

Materials and Methods: Necessary workup was done including complete physical examination and data collection regarding confounding factors. All baseline and needful investigations were done and recorded. After surgery, patients were followed on 0, 2nd, 7th, 14th, and 30th post operative day. Any complications observed were recorded on a proforma.

Results: A total of 206 patients were included in the study. Average age of the patients was 47.16 years ± 12.84 SD with range of 19-73 years. Majority of patients had haematoma which was found in 19% patients.

Conclusions: Haematoma was the major early complication while obesity is the major factor leading to early complications in our study.

Key words: Inguinal hernia, Haematoma, Seroma, Wound dehiscence.

INTRODUCTION
Despite the advances that has been made in the fields of medicine and surgery over the past century, post-operative wound complications remains an inevitable consequence of any surgery. Whenever there is a complication it means increased length of hospital stay, delay in recovery, lost time from work, greater cost to the patient and health care system.1

In surgical practice wounds are classified as clean, clean contaminated, contaminated and dirty wounds.2 Clean wounds are defined as elective, non-emergency, non-traumatic, made under sterile aseptic surgical conditions and in which respiratory, gastrointestinal, genitourinary tracts were not entered.3 Post-operative complications of wounds can be divided into early, intermediate and late.4 Early complications are those that occur within 30 days of operation.4,5 Early complications may be infectious or non infectious.6 Common non-infectious complications are haematoma, seroma and wound dehiscence.2 Non-infectious wound complications are frequent and often confused with and treated as infection.6

A number of risk factors are responsible for increased occurrence of non-infectious wound complications like age>75 years, obesity, drugs like steroid, chemotherapeutic agents, anticoagulants, immune-suppressants, anemia, malignancy, jaundice, ascites, uraemia, pulmonary disease, vascular disease, hypertension, smoking, length of incision, depth of incision, foreign body, site of incision and wound closure technique.7,8

Inguinal hernia repair is the most common clean surgical procedure world wide.9 Inguinal hernia affects both men and women but is more common in men who comprise 90% of operated patients.9 The life time prevalence rate is 47% for men up to the age of 75 years.9 Worldwide about 20 million hernia repairs are done every year.10 Inguinal hernia can only be cured by surgery.9 Among 70 operative techniques, today only three are considered as the best evidence based treatment options: suture repair according to Shouldice, flat open mesh repair according to Lichtenstein and the laparoscopic/endoscopic methods.10 The most common method is Lichtenstein using heavy weight, polypropylene (80g/m^2) mesh.10

In literature the reported rates of seroma formation after open mesh repair for inguinal hernia surgery varies from 1.6% to 12.6%.11 In one study of all the patient who developed seroma, 36% had a BMI of more than 25kg/m^2 and 25% were smokers.2,13

The economic impact of inguinal hernia surgery is high on the health care system, yet there is scarcity of literature regarding early non-infectious wound complications and associated risk factors. Much of the em-
phasis is being given on infection in prosthetic surgery, though non-infectious complications are much more common and misdiagnosed and treated as infection. The finding of seroma or haematoma in inguinal hernia surgery is regularly associated with post-operative pain and patient discomfort and in particular can lead to severe infection with increased risk of hernia recurrence and mesh removal. These complications also cause increased length of hospital stay, frequent visits to the hospital and in some cases percutaneous drainage or surgical intervention, all increasing extra burden on health care system. The aim of the present study is to describe the most common early non-infectious complications in clean incised surgical wounds like open mesh hernioplasty and common factors leading to these complications. This study will not only identify the magnitude of the problem but also the recognition of the risk factors which will help the surgical team in adopting proper preventive measures and also effective management strategies of these complications. In our opinion it will improve outcome, improve quality of treatment, decrease morbidity and decrease extra burden on hospitals.

MATERIALS & METHODS

This case series study was conducted over 206 patients in Hayatabad Medical Complex Peshawar from June 2009 to June 2010. All patients undergoing Lichtenstein mesh repair for inguinal hernia admitted through OPD and planned to be subjected to hernia repair on elective list after obtaining written informed consent.

Patient’s demographic data were recorded on proforma. Necessary workup was done including complete physical examination and data collection regarding confounding factors. All baseline and needful investigations were done and recorded. All patients were operated under strict aseptic technique by a single surgeon.

The patients were followed on 0, 2nd, 7th, 14th, and 30th post operative day. Any complications observed were recorded on a proforma. Patients developing non-infectious complications like hematoma, wound dehiscence and seroma were carefully scrutinized for common factors like obesity, anemia, hypertension and prolonged surgery.

Patients with bleeding disorders, diabetes mellitus, using oral, intravenous or inhalational steroids or history of steroid use within three months of presentation and wounds developing surgical site infection post operatively within 30 days of surgery were excluded from the study. Exclusion criteria were followed strictly to control confounders and bias in the study results.

RESULTS

A total of 206 patients with clean incised surgical wounds for inguinal hernia repair were included in the study. All the patients were male and there was no female patient.

Average age of the patients was 47.16 years + 12.84 SD with range of 19-73 years. Patient’s age was divided in four categories, out of which most common age group for inguinal hernia repair was 46-60 years in our study. There were 33 (16%) patients of the age less than or equal to 30 years, 40 (19.4%) patients were in the age range of 31-45 years, 105 (51.0%) were of age range 46-60 years, 28 (13.6%) presented at age more than 60 years of age. Early non-infectious complications showed that majority of patients had haematoma which was found in 19.41% patients. (Fig 1)

Fig No 1: Early non-infectious complications

The common factors leading to early non-infectious wound complications in clean incised surgical wounds were observed, in which 61 (29.6%) were obesity, 31 (15%) were anemia, 16 (7.8%) have hypertension and 53 (25.7%) were prolonged surgery. Early non-infectious wound complications were more common in middle and old age as compared to younger age in our study. Fig 2 Risk factor wise distribution of early non-infectious wound complications shows that risk factors have no major role over complication. Table 1

Table 1: Age wise distribution of common factors

<table>
<thead>
<tr>
<th>Common factor</th>
<th>&lt;= 30</th>
<th>31-45</th>
<th>46-60</th>
<th>&gt;=60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged surgery</td>
<td>21.2%</td>
<td>40.0%</td>
<td>27.60%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>3.0%</td>
<td>12.5%</td>
<td>7.60%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Anaemia</td>
<td>6.1%</td>
<td>12.5%</td>
<td>18.10%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Obesity</td>
<td>21.2%</td>
<td>40.0%</td>
<td>30.50%</td>
<td>21.4%</td>
</tr>
</tbody>
</table>

Table 2: Age wise distribution of early non-infectious wound complications

<table>
<thead>
<tr>
<th>Wound complication</th>
<th>&lt;= 30</th>
<th>31-45</th>
<th>46-60</th>
<th>&gt;=60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seroma</td>
<td>18.2%</td>
<td>12.5%</td>
<td>12.40%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>6.1%</td>
<td>2.5%</td>
<td>2.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Hematoma</td>
<td>15.2%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>28.6%</td>
</tr>
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</table>
DISCUSSION

Hernia mesh repair is associated with both infectious and non-infectious wound complications. The composition and type of mesh seems to be responsible for these complications. The repair of abdominal wall defects in potentially contaminated or grossly infected fields presents a difficult clinical problem. Polypropylene mesh is relatively contraindicated in these settings because of the potential for chronic infection.

Inguinal hernia is more likely to occur in men than in women because the spermatic cord passes through the abdominal wall in the inguinal region, leaving a site of natural weakness prone to hernia formation. Results of a local study conducted at Lady Reading Hospital, Peshawar, also selected male patients.

Old age cannot be considered as an absolute risk factor in the surgical treatment of inguinal hernia, which can also be stated for the majority of elderly people pathologies. The modern tension-free techniques have demonstrated in cardiopathic patients, the same advantages which have been observed in elderly non cardiopathic patients. In our series of 206 patients mean age was 47.16 years ± 12.84 SD, which is comparable to some local studies. In our study there were 45% patients in the age ranges of 51-80 years. There was no mortality in any age group in this series. Same results were also reported by a local study, which was conducted at Lady Reading Hospital, Peshawar, in which all patients were male with mean age of 49 years. While few local and international studies reported mean age of > 60 years in their studies, differences in mean ages are probably due to sample selection criteria of various studies according to their inclusion criteria, as we have included patients from 19 years to 73 years, whereas in few studies they included older age patients e.g. from 40 to 90 years.

The goals of a successful hernia repair include low recurrence rates, permanent relief of pain or discomfort and low incidence of peri and postoperative complications, such as wound infections and intra-abdominal adhesions.

Wound dehiscence was observed in our study in 4.36% patients at follow up. Wound infection was superficial and was managed with antiseptic dressing and antibiotics. No patient required mesh removal for control of infection. Our finding were comparable with a local study in which the incidence of wound infection was reported as 7.5%. In few other local studies the incidence of wound infection has been reported from 1% to 4% cases. Wound hematoma was recorded in 19.41% cases and seroma in 14.07% cases in our study.

The risks of infection are there but use of antibiotics has overcome these problems. Infection rate in our study was much more than reported at local and international levels. Reasons for this being poor hygienic environment in operating rooms and wards, overcrowding in hospitals, and majority of operations were performed by less experienced surgeons. The other reason is from the patient’s side, as majority of our patients belonged to low socioeconomic status and they were living in poor and unhygienic conditions. In our province as transportation is a big and unaffordable matter, major portion of our patients living in the far-flung areas were unable to come for early treatment and remedy of their infections.

Results of another local study showed that wound seroma developed in 8.4% patients in Lichtenstein tension free mesh repair and 3.1% patients developed hematoma. Abscess formation was noticed in 1.9% patients and urinary retention developed in 4.6% patients. Numbness or pain in the groin was complained by 10% patients and recurrence developed in 2(0.8%) patients. Another local study reported that minor wound infection was noted in two cases and seroma formation in one case. There were two cases of recurrence during initial follow up of one year. At the end they concluded that tension free mesh repair is the pro-

<table>
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<th>Table 3: Risk factors wise distribution of early non infectious wound complications</th>
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<tr>
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<tr>
<td></td>
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<tr>
<td>Obesity</td>
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<tr>
<td>Yes</td>
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<tr>
<td>No</td>
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<tr>
<td>Anemia</td>
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<tr>
<td>Yes</td>
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<td>No</td>
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<tr>
<td>Hypertension</td>
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<td>No</td>
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<tr>
<td>Prolonged Surgery</td>
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<td>Yes</td>
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<td>No</td>
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procedure of choice for inguinal hernia repair.25

Duration of hospital stay is another risk factor for acquiring infections during this period. In our study majority of our patients stayed in hospital from 3 to 5 days with mean hospital stay of 3.5 + 0.63 days. More or less same results are reported in various national and international studies.5,26

CONCLUSION

Mesh repair is an easy and safe procedure for different types of hernias. Although it is an efficient method of hernia repair but associated with a number of complications. These complications can be prevented with good surgical techniques, aseptic measures and effective prophylactic antibiotics. It is strongly recommended that mesh repair is the first treatment option for patients with primary and recurrent inguinal hernias with good antibiotics cover preoperatively.

REFERENCES

1. Perkins JD, Pattillo RA. How to avert postoperative wound complications and treat it when it occurs. OBG management 2009;21(10):43-53
Frequency of Radial Nerve Injury in Patients with Closed Fracture of Humerus Shaft

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Muhammad Shoai Khan, FCPS³, Javed Iqbal MBBS⁴
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ABSTRACT
Background: Radial nerve palsy is a common condition occurring in patients with traumatic humeral fractures.¹,² It is due to the anatomic location of the radial nerve which turns around the distal portion of the humeral shaft and is separated from it by a layer of triceps fibers. When the radial nerve pierces the lateral intramuscular septum to enter the anterior compartment of the arm, it is relatively more fixed and susceptible to injury.³,⁴

Radial nerve palsies with humeral fractures may be primary or secondary. Primary nerve palsies that occur at the time of the injury.⁵ Secondary palsies are those that occur with closed reduction and manipulation or open reduction and internal fixation. Only a few cases of radial palsy due to humeral fracture are reported in the literature.⁶

If the radial nerve gets damaged there is difficulty extending the arm past the elbow, difficulty maneuvering the wrist, numbness, a decrease in sensation, tingling, burning sensations and pain.⁷ Humeral shaft fracture with radial nerve palsy and its management has been the subject of debate.⁸ since this entity was originally described by Holstein and Lewis in 1963.⁹,¹⁰ In the last years a conservative treatment of a humeral fracture is the exception and only used after straight indications. The operative therapy nowadays is the gold standard because of the development of new intramedullar and rotation stable implants in addition to the classical osteosynthesis with the plate.¹¹ This study was designed to know the current frequency of radial nerve injury in closed humeral shaft fracture so that in the light of this frequency we may be able to design certain guidelines and recommendations in early workup for radial nerve injury in patients with closed fracture of humerus shaft.

MATERIALS AND METHODS

This study was conducted in Department of Orthopedics and Emergency room, Khyber Teaching Hospital, Peshawar from Sept, 2011 to Sept 2013 recruiting 164 patients. Patients were managed initially by fracture stabilization and analgesia requirement then they were carefully assessed to detect radial nerve injury on the basis of wrist drop with no extension of wrist, finger and thumb. Data was analyzed with the help of SPSS version 10.00.

RESULTS: There were 100 (60.97%) males and 64 (39.03%) females. There were 60 (36.58%) spiral fracture, 40 (24.39%) transverse fracture, 34 (20.73%) comminuted fracture and 30 (18.29%) segmental fracture. Radial nerve injury was present in 14 (8.53%) patients; 7 (11.66%) in spiral, 3 (7.55%) in transverse, 2 (5.88%) in comminuted and 2 (6.66%) in segmental fractures of humerus shaft.

CONCLUSION: The frequency of radial nerve injury is more in patients with spiral and transverse closed fracture of the humerus shaft.

Key words: Radial nerve injury, closed humerus shaft fracture

INTRODUCTION
Radial nerve palsy is a common condition occurring in patients with traumatic humeral fractures.¹,² It is due to the anatomic location of the radial nerve which turns around the distal portion of the humeral shaft and is separated from it by a layer of triceps fibers. When the radial nerve pierces the lateral intramuscular septum to enter the anterior compartment of the arm, it is relatively more fixed and susceptible to injury.³,⁴

Radial nerve palsies with humeral fractures may be primary or secondary. Primary nerve palsies that occur at the time of the injury.⁵ Secondary palsies are those that occur with closed reduction and manipulation or open reduction and internal fixation. Only a few cases of radial palsy due to humeral fracture are reported in the literature.⁶

If the radial nerve gets damaged there is difficulty extending the arm past the elbow, difficulty maneuvering the wrist, numbness, a decrease in sensation, tingling, burning sensations and pain.⁷ Humeral shaft fracture with radial nerve palsy and its management has been the subject of debate.⁸ since this entity was originally described by Holstein and Lewis in 1963.⁹,¹⁰ In the last years a conservative treatment of a humeral fracture is the exception and only used after straight indications. The operative therapy nowadays is the gold standard because of the development of new intramedullar and rotation stable implants in addition to the classical osteosynthesis with the plate.¹¹ This study was designed to know the current frequency of radial nerve injury in closed humeral shaft fracture so that in the light of this frequency we may be able to design certain guidelines and recommendations in early workup for radial nerve injury in patients with closed fracture of humerus shaft.

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Received: Oct’2013 Accepted: Dec’2013
The diagnosis of humerus shaft fracture was done on the basis of break in the continuity of shaft of humerus as seen on x-ray. The diagnosis of radial nerve injury was established clinically on the basis of examination findings of whether the patient was able to extend finger and wrist or not, if unable to extend finger and wrist it was recorded as radial nerve injury positive and vice versa. The purpose and benefits of the study was explained to the patient and a written informed consent was obtained. All the patients were worked up with detailed history and clinical examination. Standard ward protocol was followed to manage the patients initially including fracture stabilization and analgesia requirement. All the patients were carefully assessed to detect radial nerve injury. The data analysis was done through software SPSS version 10.0.

**RESULTS**

There were 100 (60.97%) males and 64 (39.03%) females. The age range was 20 to 60 years and mean age of males and females was 41.62 ± 10.3463 and 42.43 ± 7.0640 respectively with overall mean age ± SD was 41.93 ± 9.1903. There were 60 (36.58%) cases of spiral fracture, 40 (24.39%) cases of transverse fracture, 34 (20.73%) cases of comminuted fracture and 30 (18.29%) cases of segmental fracture. (Table No. 1) Radial nerve injury was present in 14 (8.53%) patients. Out of total 14 cases of radial nerve injury, 3 (21.42%) were females and 11 (78.57%) were males. (Table No. 2 & 3) Out of these 14 cases of radial nerve injury; 7 (50%) cases were recorded in patients with spiral closed fracture of midshaft of humerus, 3 (21.42%) cases were recorded in transverse closed fracture of humerus shaft, 2 (14.28%) cases in comminuted closed fracture of mid shaft of humerus and 2(14.28%) cases were recorded in segmental closed fracture of humerus shaft. (Table No. 4)

**DISCUSSION**

Radial nerve injuries associated with fracture shaft of humerus are the most common peripheral nerve injuries in long bone fractures and it is due to the fracturing force, by the fractured ends or by traction when the fractured ends are forcibly separated.12,13

Radial nerve injury in closed humeral shaft fractures is commonly encountered in orthopedics department. In our study with a sample size of 164, we recorded 14 cases of radial nerve injury while according to a review of 21 papers the overall prevalence was of radial nerve injury due to humerus shaft fractures was 11.8% with the middle and middle-distal parts of shaft having a significantly higher association of radial nerve palsy.14 In a systematic literature review, Shao et al.,15 identified 532 radial nerve palsies in 4517 humeral shaft fractures; an 11.8% incidence of radial nerve palsy.14 In a local retrospective descriptive study conducted at Combined Military Hospital (CMH) Multan, fracture of humerus were second most common (21% each) cause of radial nerve injury. This observation also is in agreement with stern.16 Our study also focuses on the same concept of frequency of radial nerve injury due to closed humerus shaft fractures.

Among trauma patients, a radial nerve injury associated with a humeral shaft fracture is an important injury. Radial nerve palsy is the most common peripheral nerve injury associated with this fracture. In our study, spiral fracture was most common (36.58%), followed by transverse fracture (24.39%), comminuted fracture (20.73%) and segmental fracture (18.29%). This
corresponds with another study in which the frequency of simple transverse fracture was (18.3%) and simple spiral fracture was (17.1%) which were both situated in the middle third of the diaphysis, were twice as frequent as any other fracture and between them made up more than one third of the total humerus fractures.

Out of the 14 cases of radial nerve injury in our study, the incidence of radial nerve injury was also maximum in spiral fracture (50%) followed by transverse fracture (18.3%) and simple transverse fracture was (17.1%) which were both situated in the middle third of the diaphysis, were twice as frequent as any other fracture and between them made up more than one third of the total humerus fractures.

We performed this study in a community setting with patients of various socioeconomic classes and participants' compliance was high. In our study, statistical analyses were straight forward and missing data analysis was not required. It must also be noted that the short follow up period was the limitation of our study. Further research is needed of longer duration and comparison may be needed to confirm our result.

CONCLUSION

Radial nerve injury is a common complication of closed humeral shaft fractures and its frequency is more with spiral and transverse fracture patterns than with oblique and comminuted fractures.

REFERENCES

SCLERAL EDGE, NOT OPTIC DISC OR RETINA, IS THE PRIMARY SITE OF INJURY IN CHRONIC GLAUCOMA

Dr. Syed S. Hasnain M.D.

ABSTRACT

In chronic glaucoma, there is a gradual painless loss of vision, early manifestation of arcuate field defect and typical atrophy of the optic disc known as ‘cupping’. Chronic glaucoma is classified into high-tension glaucoma (HTG) and normal-tension glaucoma (NTG). Although both types manifest with the same typical visual field defect and cupping of the optic disc, high-tension glaucoma has elevated intraocular pressure whereas in normal-tension glaucoma the intraocular pressure (IOP) is within the normal range (10-21 mmHg). There are several theories about the pathogenesis of chronic glaucoma ranging from high intraocular pressure directly damaging the optic disc to programmed death (apoptosis) of the ganglion cells. But none of them satisfactorily explain the manifestation of the early arcuate field defect which is a pathognomonic feature of both types of chronic glaucoma.

The article (in reference, see October’2013 issue) focuses on two main issues. First, how and why the arcuate field defects are produced in the early stages of glaucoma and secondly to find out the common ground in the pathogenesis of both high and normal tension glaucoma. The early arcuate field defects are an important lead in discovering the pathogenesis of glaucoma, therefore if any factor or site which could not possibly produce initial sharply defined arcuate field defects was ruled out. This article presents an unconventional approach to the pathogenesis of glaucoma. Instead of looking for various factors causing glaucoma, emphasis was placed on determining the primary site of injury which could produce the initial arcuate field defects. Keeping the arcuate visual field defects in mind, the primary site of injury appears to be at the scleral edge and not the optic disc or the retina in chronic glaucoma. The border tissue which separates the sclera and choroid from the nerve fibers would atrophy due to chronic ischemia as a result of high intraocular pressure in HTG, whereas due to poor systemic circulation in NTG.

In both types of chronic glaucoma, the ciliary circulation supplying the pre-laminar and border tissue is compromised. As a result of atrophy of the border tissue, the optic disc sinks as a whole beginning temporally due to its tilted position and causing nerve fibers to stretch, kink, and cut at the scleral edge. This process of optic disc sinking would accelerate due to loss of nerve fibers which also provides anchorage to the optic disc. This cycle would continue until all the nerve fibers are cut at the scleral edge and the optic disc is destroyed.

REFERENCE:
New Trends for Infantile Haemangioma

Mazhar U Zaman Soomro1, Sidra Riaz2, Mohammad Arshad3

ABSTRACT:
New modality for treatment of infantile haemangioma can be considered with B-blocker mainly atenolol given orally. The mode of action of these drugs are thought to be vasoconstrictor, regulating angiogenic pathways and inducing apoptosis of vascular endothelial cells. Now a days B- blockers are used for the treatment before initiation of other mode of treatment like steroids, laser, resection etc. Although B-blockers are not widely approved indication for infantile haemangioma (IHs) but becoming a promising new modality. Before starting the therapy all cases should be assessed by a cardiologist and follow up should be scheduled.

CASE REPORT
A baby aged 2 months was examined at the clinic with a complaint of reddish mass at upper right lid. On external examination of the baby there was a multilobed mass (infantile haemangioma) of about 3.5 x 3 mm reddish in color involving medial half of eye brow and upper lid. Due to this mass baby could not open his other eye. Under biomicroscopic examination no abnormality was found in conjunctiva, cornea and anterior chamber. Size of both eye balls was symmetrical. Also other eye was within normal limits. Consent was taken before the start of treatment. The regimen of treatment was 0.5 mg/kg per day for 7 days and then 1 mg/kg of atenolol given orally. Ophthalmic as well as cardiac follow up was done every 2 months and it was found that the lesion started regressing after 2 months and baby was able to open his eye. Follow up of further 10 month showed further regression of the haemangioma. The drug was stopped at the age of 10 months

DISCUSSION
Infantile haemangiomas (IHs) are benign vascular tumours found in approximately 4-10% of Caucasian infants1,2. IHs can impede the function or development of neighbouring structures or organs necessitating treatment. Infantile haemangioma (IHs) is a benign vascular that has three phases of development: Haemangioma proliferates in first phase, the second phase is rest phase and the third phase is involution. In most of cases these haemangioma undergo spontaneous resolution and small proportion need intervention. The unanimous opinion is that these haemangioma should be treated in proliferative phase under following condition: vision is affected or might be due to amblyopia secondary to induced astigmatism, anisometropia and occlusion, optic nerve compression, exposure keratopathy, or severe cosmetic blemish, necrosis or infection, visceral involvement may become life threatening, rapid growth leads to anatomical distortion that may resolve partially and tumor is causing congestive cardiac failure.

Since the report of Léauté-Labrèze et al., the treatment of IH with beta-blockers has become the treatment of choice4-6. As far as we know, only one randomized controlled trial (RCT) has proven the effectiveness of propranolol7. Nevertheless, there seems to be a general agreement that propranolol is effective in IH treatment and studies now focus on optimal treatment regimen and on beta-blockers with a more favorable balance between efficacy and side effects8. The results of this study confirm that atenolol is effective in the treatment of IH. Moreover, when compared to a historical control group, atenolol seems to be as effective as propranolol but appears associated with fewer side effects. Itinteang et al9 suggested that propranolol acts via the renin–angiotensin system in regulating accelerated involution of proliferating IH by decreasing renin production in the kidneys. As the kidneys predominantly express beta-1 receptors, the renin–angiotensin–aldosterone system (RAAS) is most likely the missing link in understanding the working mechanism of both beta-blockers and angiotensin-converting enzyme (ACE) inhibitors in the treatment of IH10. Atenolol is a hydrophilic, selective beta-1 blocker and therefore is not associated with side effects attributable to beta-2 activity and lipophilicity observed with propranolol. It has a terminal half-life of 6-8 h and therefore has to be administered only once daily, which may improve patient compliance.

There are different ways to treat these haemangioma like laser, steroid injection, systemic steroids, systemic B-blockers and Local resection. Laser should be applied close to blood vessels in superficial skin lesion less than 2 mm thickness. Steroid injection of 40
mg/ml in to lesion but there are risk of central artery occlusion, depigmentation, bleeding, fat atrophy, adrenal suppression and failure to thrive. Systemic steroids may be used if there is large orbital component. Local resection with cautery may reduce the bulk of circumscribed tumor but it is usually reserved for late inactive stage. Other modality is systemic B-Blocker and we opt it for the management of the infantile haemangioma (IHs) as it is simple, convenient, economical and less hazardous to other model ties. Systemic therapy of B-blocker shows rapid action and make it most likely encourage compliance.

In this case an aggressive approach was adopted in order to prevent amblyopia. The haemangioma showed better response as it started regression within two months and baby was able to open his eye. The time for initiation of therapy was ideal for the baby of 2 month age as Infantile haemangioma is in proliferative phase (1-6 months) may result to faster resolution. The therapy was stopped at the age of 10 months as this is the appropriate time of haemangioma to regress naturally.

CONCLUSION
Alternate way of treatment of infantile haemangioma is B blocker like atenolol as compared to intralesional injection and surgery. Atenolol seems to be less frequently associated with potentially (life) threatening side effects. Further clinical studies are necessary to confirm the described effects and safety of atenolol.

REFERENCES
With the advent of internet facility there has been an increasing trend of plagiarism in every field of life especially the research field of education sector. We are not surprised to see that most of the young doctors aspiring for their promotions, research degrees or a doctorate, are busy in writing articles, research papers or a thesis and to get them recognized by hook or crook through publication in scientific journals, is a very lamenting affair. We have also noticed that they embark on such subjects which have already been undertaken by many other authors and their results are well established and fully documented in the text books as a solid theorem and does not require further research except in very few corners which need extended ‘probe in’. They never try new fields in academics as it entails lot of time and hard work, even their supervisors or heads of the departments never bother to advise them not to select such hackneyed topics or a stereotyped attempt on a particular subject.

To quote few examples in the field of ophthalmology we hardly need any research work in finding the complications of cataract surgery, a small incision cataract surgery in phacoemulsification, comparing the efficacy of many antibiotic eye drops, modes of local anesthesia in ocular surgery, corneal repair through amniotic membrane, incidence of hepatitis B & C in intending ocular surgery especially the cataract surgery and finally the incidence of refractive errors in school going children etc. etc. There is no doubt that these are very important fields in ophthalmic horizon but one can find thousands of papers written on these topics. We are not at all critical on this point and we do not mean to discourage our young ophthalmologists either. Our aim is that the supervisors, heads of the department, reviewers and the editors of the scientific journals should guide them collectively to select from an array of available topics so they can select and produce quality work with at least some originality and we would certainly like to publish such peer-reviewed papers without any hesitation.

We are very much conscious of the fact that PMDC requires a number of papers to be published on their account in order for their next promotion. Simply to write an article on an established theorem in the text books as the requirement of PMDC is not justified. The reviewers and the editors of the scientific journals are mostly experienced teachers and they are well versed with the various topics intended for publication and undertaken by the researchers. Therefore the writer should avoid such repetition of facts in order to avoid disappointment if the topic is rejected, which will be a wastage of time and energy. In fact we consider it a dereliction of responsibility on the part of a supervisor who should be very careful in selecting and approving the subject for their trainees, keeping an eye on the instructions streamlined by Higher Education Commission, Pakistan Medical & Dental Council, College of Physicians & Surgeons, Pakistan and Ethical Committee of the hospital. In fact every teaching hospital/institution should have an Ethical Committee and the PMDC should regularly watch its research activities.

In this context, the Ophthalmology Update has adopted a very strict policy to discourage the plagiarized material or repetition of the established facts in their articles. Hence the researchers should be very careful in sending us their article which will be returned to them after review, causing great disappointment to the writer. Hence, it is extremely important for them to discuss with the heads of the department or some senior professor before finally selecting the topic. They should get their papers reviewed by them from time to time and finally get it approved by the Ethical Committee to be forwarded to the journal for publication. There is also a word of advice to the reviewers to find time from their leisure to critically review the paper, thinking it to be their academic activity as well as a prime national duty.

The question arises, where the fault lies? The answer is very simple. Our generation which includes doctors and scientists has great potential in terms of manpower, equipment and finances and unfortunately, this capacity has ever remained under-utilized. Our universities and professional institutions are the seats of excellence in higher learning and we must focus our attention on promotion of academic and research activities besides producing best physicians and surgeons. Our history tells us that “these seats of higher learning are suffering from stagnation” and we must pledge to break this stagnancy to make progress through research which is the only way to achieve excellence in any field.

. . . . . . . . Chief Editor