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New Avenue in the Treatment of Eye Diseases

Many retinal diseases have witnessed impressive advances in their management over the past decade. Most of these advances have involved pharmacologic innovation aimed at controlling exudative pathologies of the retina, including neovascular age-related macular degeneration (AMD), macular edema secondary to diabetic retinopathy, and venous occlusive diseases. These advances have relied upon an intraocular delivery of a pharmacologic agent by direct intravitreal injection. Other, more complex treatment approaches to vitreoretinal disorders have made substantial advances over the same period but have yet to make significant clinical impact. Remarkable progress has been achieved in both the use of retinal prosthetic systems and stem cell delivery to treat retinal degeneration. Exploiting the ability of human viruses to enter cells, replacing genes has now become a reality in ophthalmology. At present, gene therapy is possibly the most targeted and exciting of these recent advances whose promise is just beginning to be manifest in the management of inherited retinal diseases.

Related to retinal disease management, “gene therapy” refers to the incorporation of new DNA into cells, either to supply a gene that is missing or not functioning in that cell or to supply a therapeutic gene. Several characteristics make the retina an ideal target for gene therapy:

- The intraocular environment is easily accessed through the pars plana by a relatively noninvasive approach compared with other internal organs, and the amount of retinal tissue is relatively small compared with most visceral organ systems.
- The blood-retinal barrier creates an intraocular environment that is relatively isolated from the systemic immune system, affording some degree of tolerance for administered foreign antigens and minimization of systemic vector spread.
- Treatment outcomes can be easily monitored both subjectively (eg, with patient visual acuity) and objectively (eg, with electrophysiology and optical coherence tomography).
- The ordered, epithelial architecture of retinal layers allows an administered vector easy access to entire cell populations.

The 3 most commonly used vector systems for retinal gene delivery are adenoviral vectors, lentiviral vectors, and recombinant adeno-associated virus (rAAV) vectors. The most widely used vectors for ocular gene therapy -- rAAV vectors -- do not contain viral genes but rather are engineered to contain specific DNA sequences that can be used for therapeutic purposes. rAAV is able to transduce both dividing and non-dividing cells, and different serotypes can be used to preferentially target specific retinal cell types, including the photoreceptors, RPE, or ganglion cells.

The combination of an accessible target tissue (the retina) with multiple monogenic blinding diseases with no available treatment spurred extensive research over the past 20 years. Current approaches deliver therapeutic vectors via intravitreal or subretinal injection. The vector is a protein envelope, or capsid, with its native DNA replaced by the target gene and a promoter. The promoter enhances the activity of the gene to boost production of the target protein. To treat a genetic disorder the target gene produces the missing protein responsible for disease. To treat acquired disorders the target gene produces a therapeutic protein. Both the intravitreal and sub-retinal approaches can offer efficient transduction and long-term expression of the target protein. Vectors are non-pathogenic, have low immunogenicity, are non-replicating and do not integrate with the ocular genome.

Both routes have advantages and disadvantages. Intravitreal injection is 100 to 1,000-fold less efficient...
than sub-retinal injection. But the sub-retinal route is more invasive and may not be acceptable in some disorders due to compromised retinal structure.

All of the key ingredients needed for successful ocular gene therapy are in place. Researchers have developed a menu of successful vectors that target different layers of the retina to deliver genes to treat different diseases. They have identified target genes responsible for specific diseases, have created successful animal models, surgical approaches, outcomes measures and safety data. rAAVs that target the nerve fiber layer may be useful for the treatment of glaucoma while vectors that target the Muller cells could treat X-linked retinoschisis. Vectors that transfect photoreceptors may be useful for some forms of RP while other vectors that transfect the RPE and choroid are more appropriate for other forms of retinal degeneration as well as wet and dry age-related macular degeneration (AMD). Approximately 2% of current gene therapy clinical trials are focused on ocular diseases. The Journal of Gene Medicine. Indications addressed by gene therapy clinical trials. http://www.abedia.com/wiley/indications.php.

Building on successful animal models, at present it is noted the translation of this basic science research to human clinical application. Retinal gene therapy is intended to replace a defective gene product, that is why gene therapy may be the only way to treat inherited diseases like Leber congenital amaurosis (LCA), Retinitis Pigmentosa (RP), Stargardt’s, choroideremia, X-linked retinoschisis, Achromatopsia and Red-green color vision deficiency.

Leber’s congenital amaurosis is a severe, blinding, typically autosomal recessive retinopathy resulting from mutation in one of more than a dozen causative genes. Affected people are usually diagnosed within the first few months of life, typically being born with very poor visual function and experiencing progressive visual decline that often leads to total blindness. Mutations in the RPE65 gene disrupt the visual-retinoid cycle and impair production of the visual pigments rhodopsin and cone opsin with concomitant toxic accumulation of all-trans-retinal esters, promoting photoreceptor death and leading to LCA type 2 (LCA2).

Early results of gene therapy studies for inherited retinopathies are compelling; phase 1 human clinical trials have demonstrated safe and successful targeting of mutant genes involving the RPE (LCA2) and photoreceptors (choroideremia). Replacing the RPE65 gene via a sub-retinal injection using adeno-associated virus vector has had promising results with improved visual and retinal function. At least one pivotal phase III trial using gene therapy to treat LCA will likely be submitted to the FDA for approval later this year.

In addition to replacing dysfunctional gene products caused by mutations in a person’s germline, gene therapy can serve as a platform for drug delivery a therapeutic gene, therefore any retinal disease that could benefit from local production of a specific RNA or protein is a potential candidate for gene therapy.

Currently, therapies applied for neovascular AMD involve pharmacologic agents that block vascular endothelial growth factor (VEGF). These medications achieve VEGF suppression remarkably well, but the relatively short half-lives of these biological proteins, often necessitate monthly administration for maximal clinical effect and visual benefit, especially in recalcitrant cases. The need for longer-acting therapeutics may be fulfilled with gene therapy. Adenoviral vector expressing pigment epithelium-derived factor that inhibits angiogenesis was used with success in a phase 1 trial.

Current data clearly demonstrate that viral-encoded RNAi effector molecules can be used for the inhibition of neo-vascularization and will, in combination with the growing interest of applying DNA- or RNA-based technologies in the clinic, undoubtly contribute to the development of efficacious long-term gene therapy treatment of intraocular neovascular diseases. The latest research supports a promising neuroprotective gene therapy approach that targets neovascularization in diabetic retinopathy. In the retina, neovascularization most commonly occurs during retinopathy of prematurity and as a common secondary complication to diabetic retinopathy.

In conclusion, by discovering the ability of human viruses to enter cells, replacing genes has now become a reality in ophthalmology. A modified virus is used as a vector to transport the wanted gene into the affected cell. With continued development and refinement of gene therapy technologies and techniques, the clinical application of gene therapy vectors to treat a host of retinal diseases in the clinic appears on the horizon.

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Editorial


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NOTE:
Prof. Marianne is a doyenne in the ophthalmic world. She is a very conscientious, a devoted researcher, highly gifted and of course, a charismatic charming lady from Armenia. She has carried out extensive research on retinal disorders especially on Macular pathologies and currently on gene therapy on management of inherited retinal diseases. Ophthalmology Update is proud of her presence on our editorial board…………………..Chief Editor

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INTRODUCTION

The aim of this article is to review both bacterial and fungal keratitis, with an emphasis on identification and management at the primary, secondary, and tertiary levels.

Microbial keratitis is an infection of the cornea. Corneal opacities, which are frequently due to microbial keratitis, remain among the top five causes of blindness worldwide. Microbial keratitis disproportionately affects low and middle income countries. Studies indicate that the incidence of microbial keratitis may be up to 10 times higher in countries like Nepal and India as compared to the United States. Rural agricultural communities in low and middle income countries face a particularly high burden from corneal blindness. The most common cause of microbial keratitis is infection following a corneal abrasion. People are at greater risk of corneal injuries from agricultural activities, manual labour, and domestic work, which can result in infections of the cornea through contact with contaminated objects. Microbial keratitis tends to affect people at younger ages, in their prime working years, compared to other causes of blindness (such as cataract), which generally affect older people.

Rural communities in low and middle income countries face numerous obstacles in accessing appropriate treatment for microbial keratitis. Long delays in presentation and use of traditional medicines are common, increasing the risk of perforation and other complications that may result in vision loss. Patients with corneal ulcers may also face worse outcomes due to a lack of effective treatment options as well as an inability to afford medications when treatment is available. Opportunities for rehabilitation through surgical procedures are also limited by a lack of donor corneas for transplants.

Even when appropriate medical care is available, the corneal scarring that accompanies healing often results in visual impairment, despite successful antimicrobial treatment. Trials comparing antimicrobials for microbial keratitis generally have been unable to discern differences in visual acuity after treatment. An exception is that Natamycin has been shown to be more effective than Voriconazole for fungal corneal ulcers. Studies trialing adjunctive therapies with agents, such as topical corticosteroids, to reduce scarring, also have been largely unable to demonstrate major differences in visual outcomes in bacterial keratitis. Given the limitations associated with available treatment options, secondary prevention (i.e. the prevention of visual impairment in someone with a corneal injury and/or infection) may be the best option for reducing vision loss associated with microbial keratitis.

A series of studies in South-East Asia suggested that antimicrobial ointment applied soon after a corneal abrasion could dramatically reduce the incidence of microbial keratitis. The Bhaktapur Eye Study in Nepal was the first of these to show promising results for microbial keratitis prevention programs at
village level (in Basic Health Units in Pakistan). In this study, primary eye care workers from the community were trained to diagnose corneal abrasions with fluorescein strips and a blue torch. They then provided topical chloramphenicol to all patients with a corneal epithelial defect. This study has found that only 4% of patients treated for a corneal abrasion developed a corneal ulcer, and that an ulcer only developed if the antibiotic was applied more than 18 hours after the eye trauma.

A similar study conducted in Bhutan corroborated the Nepal study’s findings, and suggested that a microbial keratitis prevention program may be effective even in isolated rural areas. In Myanmar, low rates – much lower than previous estimates – of bacterial and fungal ulcers were observed after the institution of the village eye worker program. In a trial conducted in South India in individuals with corneal abrasions, those randomized to antibiotic prophylaxis had low rates of corneal ulcers, similar to rates observed in patients randomized to antibiotic plus antifungal prophylaxis, suggesting that antibacterial prophylaxis alone might prevent both bacterial and fungal infections.

These studies demonstrated that village health workers (BHU in Pakistan) can be trained to diagnose corneal abrasions and provide prophylactic treatment, and suggested that this simple intervention might be effective. These studies also indicate that the following simple tools may be used to identify and prevent microbial keratitis.

Fluorescein dye: Applied to the eye using sterile strips or solution, fluorescein will stain corneal epithelial defects/abrasions.

Blue torch. A blue light shone onto the cornea with fluorescein dye will highlight a corneal abrasion, which is visible as a bright green area.

Slit Lamp. is helpful in determining the existence of a corneal abrasion.

Prophylaxis. Once a corneal abrasion is identified, antibiotic and antifungal ointments should be applied three times a day for 3 days to prevent infection.

Infections of the cornea can lead to corneal opacity and blindness if not identified quickly and managed appropriately. The terms ‘microbial keratitis’, ‘infective keratitis’ and ‘suppurative keratitis’ are all used to describe suppurative infections of the cornea. These infections are characterized by the presence of white or yellowish infiltrates in the corneal stroma, with or without an overlying corneal epithelial defect, and associated with signs of inflammation (Figure 1). The common symptomatic complaints of patients with microbial keratitis are as follows (all with varying degrees of severity): redness of the eye, pain, blurring of vision, photophobia, watering or discharge from the eye.

Figure 1: Severe microbial keratitis due to a filamentary fungal infection. Extensive infiltrate, satellite lesions and a hypopyon are present. (Curtsey: Dr. Matthew Burton)

As infectious ocular diseases decline, microbial keratitis continues to be a major cause of vision loss globally. While the continued exploration of treatment options for corneal ulcers is essential, we must also focus efforts on opportunities for prevention. In low and middle income countries, the prevention of microbial keratitis is a promising intervention for reducing corneal blindness. A large community randomized trial examining corneal ulcer prevention by trained village-level health workers is currently underway in Nepal. Similarly, another study in south India will further examine corneal ulcer education program. Looking forward, with increased awareness and implementation of preventive strategies, it should be possible to reduce the burden of corneal blindness worldwide.
History Taking & Diagnosis

History taking is an important step in the management of corneal infection. If there has been an injury, ask when and where the injury was sustained, what the patient was doing at the time of injury, whether or not he or she sought help following the injury, and what treatment – including traditional eye medications – had been used. A past history of conjunctivitis may suggest that the infection is secondary to a conjunctival pathogen.

1. Visual acuity: Visual acuity should always be recorded in co-operative patients. If it is not possible to record the visual acuity of a child, for example, a note of this should be made. Vision should be recorded first in the unaffected eye, then in the affected eye; with or without glasses. This provides a useful guide to the prognosis and response to treatment.

2. Examination of the cornea: A torch with a good source of focused light and a loupe for magnification are essential/ at BHU level. A slit lamp microscope, if available, is always helpful, but not absolutely essential. Another essential tool is fluorescein dye, either in a sterile strip or a sterile solution. Fluorescein stains any part of the cornea that has lost the epithelium, even due to a trivial injury, and appears brilliant green when viewed under blue light (Figure 3).

3. Clinical signs: When you examine the eye, look for the presence of the following signs and document them carefully in the clinical notes. This will be helpful when considering whether the eye is responding to treatment.
   a. Eyelid abnormalities – such as trichiasis and lagophthalmos
   b. Reduced corneal sensation
   c. Conjunctival inflammation and discharge
   d. Corneal epithelial defects (confirmed with fluorescein) – size and shape
   e. Corneal inflammatory infiltrate – size and shape
   f. Thinning or perforation of the cornea
   g. Hypopyon.

4. Microbiology. For lesions >2mm in diameter, a corneal scrape sample should be collected for microbiological analysis whenever possible.

5. Management at primary level: Microbial keratitis is an ophthalmic emergency, which needs proper management. The following are useful guidelines.
   - Do apply antibiotic drops or ointment.
   - Do instruct patients and/or their accompanying persons to apply drops frequently.
   - Don’t give systemic antibiotics; they are not helpful.
   - Don’t use steroid drops and/or ointment, they can be dangerous.
   - Don’t routinely patch the eye, it is not necessary.

It should be remembered that, in tropical regions, bacterial and fungal infections occur with similar frequency.

Specific Initial Treatment

1. No fungal elements seen on microscopy, or fungal keratitis is not suspected on clinical grounds. Treat with either:
   - Cefazolin 5% and gentamicin 1.4% eye drops, hourly,
   - or
   - Ciprofloxacin or ofloxacin eye drops, hourly.
If it is not possible to administer hourly drops, a subconjunctival injection can be given.

Fungal elements seen on microscopy, or fungal keratitis is suspected on clinical grounds
Treat with Natamycin 5 % eye drops hourly, particularly if filamentary fungi are seen on microscopy. If yeasts (Candida) are suspected, use freshly reconstituted amphotericin-B 0.15% eye drops hourly. Antibiotics may have a limited role to play in such cases and may occasionally be harmful. Clinical judgment correlated with laboratory tests are the best guide in such cases.

Adjunctive treatment
   - Atropine 1% or homatropine 2% could be used twice a day to dilate the pupil; this helps to prevent synechiae and relieve pain.
   - Oral analgesics will help to minimize pain
   - Anti-glaucoma medication may be advisable if the intraocular pressure is high.
   - Vitamin A supplements may be helpful, particularly in countries where vitamin A
deficiency is prevalent.

- **Remember the five As: Antibiotic/ Antifungal, Atropine, Analgesics, Anti-glaucoma medications, and Vitamin A.**

**Subsequent Management**

Microbial keratitis patients should be admitted and examined daily (if possible with a slit lamp) so that their response to treatment can be evaluated and the frequency of antibiotics adjusted accordingly. Reduce the frequency of antibiotic administration when the patient experiences symptomatic improvement (less tearing and photophobia, relief from pain and improvement in vision), and when the ulcer shows signs of improvement, including:

- decrease in lid oedema
- decrease in conjunctival chemosis and bulbar conjunctival injection
- reduction in density of the infiltrate and area of epithelial ulceration
- reduction of haziness of the perimeter of the ulcer and of the stromal infiltrate
- decrease in inflammation, cells, fibrin, and level of hypopyon
- dilatation of pupil.

If the patient is judged to be improving, the dose of antibiotics and/or antifungal drops should be reduced from hourly to 2-hourly, then 4-hourly over the next 2 weeks for bacterial ulcers. For fungal ulcers, treatment should be continued with three-hourly drops for at least three weeks, as late re-activation of infection can occur. Longer courses may be needed in more severe cases.

**Bacterial Ulcers.** In the case of bacterial infection, the inflammatory reaction may be enhanced by endotoxin release during the first 48 hours of treatment; however, definite progression at this stage is unusual and implies that either the organisms are resistant to therapy, or the patient is not instilling the drops as prescribed. We expect improvement within 3 days, and fungal ulcers within a week. By the time patients have reached a tertiary centre, they will have travelled from one place to another and received several treatments, may have lost faith in eye care personnel, and may already have run out of money, considering this broader personal situation is important in the overall care of corneal ulcer patients. A careful history of the development of the disease may point to the existence of an underlying predisposing condition such as diabetes mellitus, immune-suppression due to local or systemic steroids (or other immune-suppressants), dacryocystitis, or other ocular conditions. A full list of drugs used by the patient should be obtained to ensure that drugs which have not helped in the past are not repeated; this may also help to discover possible drug allergies. Findings should be carefully noted on a standard form. A meticulous corneal scraping subjected to laboratory processing often provides a sound guideline to treatment. Hospitalization provides patients with rest and adequate medication; they can also receive frequent follow-up, management of systemic problems, such as diabetes, and further surgical intervention, if warranted.

**Treatment**

The initial treatment depends on the results of the corneal scrape and the local pattern of pathogens and antibiotic resistance.

(i) If microscopy is negative, if it is not possible to perform a corneal scrape, if Gram-positive or Gram-negative bacteria are visualized, treat the patient with antibiotic eye drops. Use either a combination of cefazolin 5% and gentamycin 1.4%, or fluoroquinolone monotherapy (e.g. ciprofloxacin 0.3% or ofloxacin 0.3%). To begin with, drops should be given hourly for 2 days and then tapered, based on response.

(ii) If microscopy reveals fungal hyphae, topical natamycin 5% or amphotericin-B 0.15% should be used hourly for a week and then tapered.

(iii) If the ulcer seems to respond well to treatment, continue therapy as before for 2 weeks for a bacterial ulcer and at least 3 weeks for a fungal ulcer.

(iv) If the response is poor and the culture shows growth of a bacterial organism, the choice of antibiotic is guided by the sensitivity reports.

**Fungal Ulcers:** Natamycin 5% suspension is recommended for treatment of most cases of filamentous fungal keratitis, particularly those caused by Fusarium sp. Natamycin 5% was found to be more effective than Voriconazole in a recent clinical trial. Most clinical and experimental evidence suggests that topical amphotericin-B (0.15 – 0.5%) is the most efficacious agent available to treat yeast keratitis. Amphotericin-B is also effective for fungal keratitis caused by Aspergillus sp. Oral anti-fungal agents may be considered as an adjunctive therapy in more severe fungal keratitis with deep corneal or intraocular involvement. Oral fluconazole (200–400 mg/day) has been used successfully for severe keratitis caused by yeasts. Oral itraconazole (200 mg/day) has broad-spectrum activity against all Aspergillus sp. and Candida but has variable activity against Fusarium sp. More recently oral voriconazole has been used in cases of keratitis due to filamentary fungus. Other
agents such as polyhexamethylene biguanide (PHMB) 0.02%, chlorhexidine 0.02%, povidone iodine 1.5 – 5% and silver sulfadiazine 1% have been reported to possess variable antifungal activity and may be used if other drugs are not available.

Fungal infection of the deep corneal stroma may not respond to topical antifungal therapy because of poor penetration of these agents in the presence of an intact epithelium. It has been reported that a 5 mm epithelial debridement (as a diagnostic scraping or therapeutic procedure) greatly enhances the penetration of antifungal drugs. Animal experiments indicate that frequent topical application (every five minutes) for an hour can readily achieve therapeutic level.

Figure 4: Subtotal fungal ulcer. (Courtesy: Dr Whitcher)

Surgical Management: The range of surgical interventions available for management of corneal ulcers can include debridement, corneal biopsy, tissue adhesives, conjunctival flap, tarsorrhaphy, or therapeutic corneal graft. Evisceration of the eye is performed for severe pain, panophthalmitis, or life threatening complications.

Tarsorrhaphy: This is an old surgical technique that is still very useful today. Tarsorrhaphy often leads to rapid resolution of persistent epithelial defects, whatever the underlying cause. Tarsorrhaphy is effective in promoting healing in microbial keratitis caused by fungal and bacterial infections, provided the ulcer has been sterilised by effective antibacterial and/or antifungal treatment. It can be difficult to instill drops and to see the cornea following central tarsorrhaphy, so it is vital to ensure that the infection is under control before closing the eyelids.

Conjunctival flap: The principle of this technique is to promote healing of a corneal lesion by providing adequate nutrition via the conjunctival blood vessels. The flap could be of three types:
- A total flap covering the entire cornea, called Gunderson’s flap.
- A pedicle (racquet) flap. This carries its own blood supply from the limbus and is useful for ulcers near the limbus.
- A bucket handle flap. This carries its blood supply from both ends of the flap and may be less likely to retract. It is more useful for central corneal ulcers. This procedure can be performed under local anaesthesia. Harvesting adequate bulbar conjunctiva in eyes which have had previous surgery may be difficult. The flap should be as thin as possible, with minimal adherent subconjunctival tissue. Following removal of any remaining corneal epithelium, the flap should be sutured to the cornea with 10-0 nylon sutures. The conjunctival flap promotes healing by vascularisation. It is particularly useful in patients with impending perforation, when it may preserve the globe and allow subsequent corneal grafting. However, a flap may limit the penetration of topical antibiotics, so it should only be performed once the ulcer has been sterilised and the infection brought under control.

Distinguishing fungal and bacterial keratitis on clinical signs

Experienced ophthalmologists have long maintained that it is sometimes possible to distinguish fungal from bacterial microbial keratitis on the basis of clinical signs. Formal data to support this view are limited, and it is important to establish the validity of such claims to understand whether signs can reliably guide clinical decisions. In addition, antifungal treatment is often in limited supply and prohibitively expensive. Therefore, it is not feasible or desirable to prescribe empirical antifungal therapy to every patient who presents with microbial keratitis in tropical regions, where fungal infections are more frequent. Here we review research to determine whether it is possible to reliably distinguish bacterial and fungal infection clinical features alone.
Key Clinical Features: (i) serrated margins, (ii) Defined margins (iii) Raised Profile, (iv) Flat Profile.

Cases of microbial keratitis were systematically examined for specific features. These included: serrated infiltrate margins, raised slough, dry texture, satellite lesions, hypopyon, anterior chamber fibrin, and colour. Serrated infiltrate margins and raised slough (surface profile) were independently associated with fungal keratitis, and the anterior chamber fibrin was independently associated with bacterial keratitis. Some of these features are illustrated in Figure 1. By combining information about all three features, (Figure 2), it is possible to obtain a probability score for the likelihood that the microbial keratitis case is due to a fungus.

CONCLUSION
Management of microbial keratitis remains a major challenge worldwide, more so in low and middle income countries with inadequate health care resources. Although the outcome of treatment has improved significantly, many patients continue to deteriorate in spite of the best treatment that can be offered. The continued emergence of strains of microorganisms that are resistant to an ever-expanding range of antimicrobials poses an additional challenge. Further research related to prevention of microbial keratitis and enhancing host resistance are two worthwhile goals to pursue. Large-scale public education programmes to alert those at risk of microbial keratitis, and to encourage earlier presentation, should be undertaken. Coupled with this, education of practitioners, general physicians, and other health workers, as well as general ophthalmologists, will go a long way towards ensuring correct diagnosis, appropriate treatment and timely referral before extensive damage to the cornea occurs. Several studies have indicated that the best way to prevent corneal ulcers in low and middle income countries is to treat corneal abrasions in the primary care setting within 48 hours of the injury. This could be adopted in any population and is cost-effective for both health providers and the patient.

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External Dacryocystorhinostomy (DCR) without Intubation

Muhammad Ijaz Anjum FCPS, FRCS¹, Aqil-Ur-Rehman Nadeem FCPS²

ABSTRACT

Purpose: To assess the outcome of cost effective dacryocystorhinostomy without intubation.

Objectives: The purpose of this study was to assess the outcome of conventional dacryocystorhinostomy without intubation while probing and syringing being the only pre-operating investigation.

Materials & Methods: This prospective study was carried out at Ali Trust Eye Hospital, spanned over 2.5 years. Detailed history was taken and performa filled for each patient. Patients with trauma and canalicular obstruction were excluded from study. Regurgitation test and probing and syringing were done to assess level of block. External dacryocystorhinostomy without intubation was done in all cases.

Results: 53 patient, of which 8 (15%) males and 45 (85%) females were included in study. Patients were 16 to 75 years of age. All patients had positive regurgitation test and underwent probing and syringing ahead of DCR. No significant intra operative complication was encountered except an excessive bleeding in a few patients. Two (4%) patients developed recurrence of epiphora so the success rate was 96%.

Conclusion: Dacryocystorhinostomy without intubation is very successful in non-complicated cases.

INTRODUCTION

Epiphora is a common problem in ophthalmology. The causes of this problem are multiple. Once lacrimation has been excluded, the most common cause is obstruction in the drainage system. The obstruction can be anywhere. Rarely congenital anomalies of lacrimal system may mimic acute dacryocystitis.¹ Chronic dacryocystitis and nasolacrimal duct obstruction are very common.² Regurgitation test is a simple and quick method to evaluate the level of block. There are multiple sophisticated tests that definitely add to information regarding level of blockage but they are costly and not available everywhere. Probing and syringing is helpful as well as cheaper, though not perfect alternative. Dacryocystorhinostomy creates a channel from eye to nose to overcome the obstruction beyond the medial opening of common canalculus. This is conventionally done by external method. There are different other options but need modern and costly equipment. The training to perform such surgery is not available to everyone working in main cities of Pakistan. The external Dacryocystorhinostomy procedure can be performed under general hypotensive³ or local anaesthesia. Silicon tubes are usually used but not mandatory.⁴

External DCR (Open surgery, though appeared to be a bit old fashioned) yet a standard surgical procedure available to masses in Pakistan as well as United Kingdom. Surgery without silicone intubation is successful in selected cases. Endoscopic DCR can arise some complications like infection and even loss of vision. Moreover, its study require costly equipment and prolonged training, not usually available to every ophthalmologist.

MATERIALS & METHODS

A prospective study was carried out at Ali Trust Eye Hospital, Okara. It spanned over two and half years i.e. from 1st August 2010 to 30th June 2013. A standard performa was used to record all the details of every patient. A detailed history was taken such as age, sex, right or left eye involvement, duration of symptoms recorded. Past history was taken especially about probing and syringing and any surgery related to lacrimal drainage system. Patients were questioned about trauma or patients with such history were excluded from the study. Patients were inquired regarding hypertension and diabetes mellitus. Family history was taken in relation to watering of eyes. Detailed eye examination was done with Slit Lamp. Particular attention was given to find out those with

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Excess production of tears. Regurgitation test was done in every patient. All the patients underwent probing and syringing twice. This was basically an attempt to overcome obstruction, which added to knowledge the level of blockage. The patients having blockage of canaliculi or common canaliculus were excluded from study. None of the patients underwent fluorescein disappearance test, Jones dye testing, and contrast dacryocystography or nuclear lacrimal scintigraphy. All the patients up to 20 years of age were operated under general anaesthesia. Co-operative patients over 20 years were operated under Local Anaesthesia while non-co-operative under general anaesthesia. All the patients underwent conventional dacryocystorhinostomy. Nose was packed using gauze soaked with commercially available 2% xylocaine with adrenaline injection, on the effected side. The skin was incised 10mm medial to medial canthus vertically. The anterior lacrimal crest was exposed, medial palpebral ligament identified and divided. The periosteum was incised and lacrimal sac dissected. Anterior lacrimal crest and bone from lacrimal fossa were removed. Flaps of lacrimal sac and nasal mucosa were fashioned and stitched with absorbable sutures without intubation. The incision was closed in layers with interrupted stitches. Post-operatively systemic antibiotics and diclofenac sodium 50mg Tablets were given for 5-7 days. Antibiotic ointment was used locally and skin stitches removed on 5th post-operative day. Relief of symptoms and ability of syringing the passage assessed the success of surgery.

RESULTS

This prospective study included 53 patients. Eight patients (15%) were males and 45 (85%) females. Eleven (20.7%) patients were up to 20 years of age, 14 (26.4%) aged 21 to 30 years and 21 (39.6%) patients were 31 to 50 years old. The age group from 51 to 70 years included 6 (11.3%) patients. Only one patient (1.8%) was more than 70 years of age. None of the patients had diabetes, hypertension or family history of watering of eyes. 10 (18.9%) patients had probing and syringing done before presenting to us. All the patients had positive regurgitation test.

We did not come across major complications during surgery, like angular vein damage, opening of ethmoid air cells and severe damage to nasal mucosa. None of the patients (0%) developed post operative severe complications like cellulitis, cerebrospinal fluid rhinorrhea or skin scarring. Success of the surgery was assessed both subjectively and objectively. When patient is relieved of symptoms, it means subjective success. This was attained in 51 (96%) of the patients. Objective success, ability to syringe the lacrimal passages, was 100% also. None of the patients were lost during follow up.

DISCUSSION

Watering of eyes is a very common problem in ophthalmology. When surgery is the final decision, there are multiple options available. Endoscopic dacryocystorhinostomy can cause serious complications like infection and even loss of vision. In addition to this costly equipment and prolonged training is required. These are not easily available to every ophthalmologist. External dacryocystorhinostomy / open surgery may appear a bit old fashioned but is still the norm in Pakistan and even U.K. Selection of the patients is important factor of surgical outcome. Trauma disturbs normal anatomy. Canalicular obstruction may affect success rate. Patients having any of these problems were excluded from study. Previous surgery definitely disturbs anatomy but far less than complicated trauma or infection.

Most common causes of failure of surgery include inadequate size and position of ostium, scarring and Sump Syndrome. When particular stress is given to avoid these, success rate naturally gets much improved. The different studies have compared results with and without intubation. 77.8% success rate was described by Hussein et al in non-intubated patients. 88% success rate in similar patients was described by Advani et al. Zaman et al described insignificant difference between patients with and without intubation.

The use of silicone tube is not mandatory.
This is true for external and endoscopic dacryocystorhinostomy. When flaps of nasal mucosa and lacrimal sac are formed properly and stitched, in addition to proper ostium size, intubation becomes irrelevant in uncomplicated cases.

Success in surgery is of prime importance but cost should also be kept in mind. Silicone intubation definitely adds to total cost. Intubation may be done in selected cases only as it constitutes 20% of the surgical cost. Pre-operatively only regurgitation test and twice probing and syringing were used to know level of blockage. Probing and syringing is an effort to overcome the obstruction as well. None of the sophisticated tests was done pre-operatively. This is of course not ideal but significantly reduces the cost of surgery and wait for surgery. None of the patients were lost in follow up. This is mainly because of successful surgery but equally important fact being totally free surgery and follow up in this hospital.

Success rate of around 100% is not unusual. 97.77% success rate and 98% have been described in different studies. Successful surgery in all the cases was possible in selected cases, ability to form and stitch flaps in all cases, absence of severe bleeding, proper size of ostium with sterilization of surgical instruments.

CONCLUSION
External DCR is a standard surgery available to masses. Surgery without silicone intubation is successful in selected cases. Further study is needed and being continued in this institution.

REFERENCES

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CUTANEOUS COLLAGENOUS VACUOLAPATHY
A middle-aged woman presented asymptomatic, widespread rash since 2-years. On examination, multiple telangiectasis, blanched on pressure were also noted on the trunk, arms and legs. Autoimmune screening, cervical & thoraco-abdominal CT Scan, venous Doppler ultrasonography, and angiography of the legs were found to be normal. Biopsy of the abdominal wall revealed dilated vascular spaces in the upper dermis, with perivascular hyalinization with normal numbers of mast cells, and no amyloid deposition. It was diagnosed to be cutaneous collagenous vasculopathy, caused by a genetic defect which alters collagen production in skin microvasculature. Clinically, cutaneous collagenous vasculopathy is indistinguishable from generalized essential telangiectasia, but histologically reveals the characteristic thickening of capillary walls. No treatment was proposed and the lesions remained stable in follow up for a considerable period. (on line)

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The Control Effect of Orthokeratology (Ortho-k) Lenses on Axial Length Elongation in Chinese Children with Myopia

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ABSTRACT

Background: To retrospectively compare axial elongation in children with different degrees of myopia wearing spectacles and undergoing ortho-k treatment.

Methods: The medical records of 128 patients who were fitted with spectacles or orthokeratology (ortho-k) lenses in our clinic between 2008 and 2009 were reviewed. Ortho-k group comprised 65 subjects and 63 subjects wearing spectacles were included in the control group. Subjects were also divided into low-myopia, moderate-myopia and high-myopia groups, based on the basic spherical equivalent refractive error. Axial length periodically measured over 2-year of lens wear and changes in axial length were compared between treatment groups and between subgroups with different degrees of myopia.

Results: The control group exhibited more changes in axial length than the ortho-k group at both 12 months (0.39 ± 0.21 mm vs 0.16 ± 0.17 mm, p < 0.001) and 24 months (0.70 ± 0.35 mm vs 0.34 ± 0.29 mm, p < 0.001). Axial length elongation was estimated to be slower by about 51% in the ortho-k group. Similar results were found for the subgroups (49%, 59% and 46% reductions, respectively). In the group with low and moderate myopia, the annual increases in axial length were significantly different between the ortho-k and control groups during both the first (Low myopia: 0.19 ± 0.17 mm vs 0.40 ± 0.18 mm, p = 0.001; Moderate myopia: 0.14 ± 0.18 mm vs 0.45 ± 0.22 mm, p < 0.001) and second (Low myopia: 0.18 ± 0.14 mm vs 0.32 ± 0.19 mm, p = 0.012; Moderate myopia: 0.18 ± 0.16 mm vs 0.34 ± 0.30 mm, p = 0.030) years. In the high myopia groups, significant differences were only found between the orthok and control groups during the first year (0.16 ± 0.18 mm vs 0.34 ± 0.22 mm, p = 0.004). The 2-year axial elongation was significantly associated with initial age (p < 0.001) and treatment (p < 0.001), but not with gender, initial refractive error, initial axial length, initial corneal curvature.

Conclusions: This 2-years study indicates that ortho-k contact lens wear is effective for reducing myopia progression in children with low, moderate and high myopia.

Abbreviations: Ortho-K, Othokeratology; IOP, Intraocular pressure; BCVA, Best corrected visual acuity; AL, Axial length; SER, Spherical equivalent refractive error Competing interests.

INTRODUCTION

Myopia is one of the most common ocular disorders and has become more prevalent in both adults and children.1,2 High myopia is associated with increased risks of retinal and vitreous detachments as well as other disorders, such as glaucoma and macular degeneration. High myopia is also associated with increased healthcare costs and ocular-related morbidity.3 Therefore, many methods have been implemented to try to slow or stop the development of myopia in children.4 These methods generally fall into two major categories: the topical application of tropicamide5, atropine6, pirenzepine7 or some ocular hypotensive agent8 or optical treatments, such as rigid contact lenses9, bifocal spectacle lenses10 or multifocal spectacle lenses.11 However, none of these methods are ideal due to limitations in efficacy, safety, economic feasibility or ease of application. Myopia is a remediable cause of visual impairment12 and is one of the five priorities set by Vision 2020, the global initiative for the elimination of avoidable blindness, launched by the World Health Organization (WHO).13

Ortho-k contact lens wear is a promising strategy for reducing myopic development in myopic children. Elongation of axial length compared with subjects wearing spectacles was slower by 49%, 59% and 46% for low, moderate and high myopia during 2-year period. Ortho-k treatment would be more beneficial to younger myopic children. Early initiation of ortho-k treatment may be possible to reduce the prevalence of high myopia.

Vision 2020 also seeks to increase awareness of the growing problem of myopia in children. Although the impact of myopia on quality of life is not as large as the impact from cataracts or other ocular pathologies14, the age of onset for refractive errors suggests that this burden may be, in some ways, even greater than that of cataracts.15
If effective treatment strategies can be found to reduce the rate of myopic progression, effects on socioeconomic health caused by myopia, can be profoundly reduced. The specific mechanisms involved in the etiology of myopia are still unclear; however, there are currently three hypotheses regarding the progression of juvenile-onset of myopia. First, it has been hypothesized that a high near-accommodation lag induces abnormal axial growth of the eye, though many studies have found no association between accommodative lag and myopic progression. The second hypothesis is based on longitudinal ocular growth data from emmetropic and myopic children and states that mechanical tension, created by the crystalline lens or ciliary body, restricts equatorial ocular expansion and causes accelerated axial elongation. A thickened ciliary muscle and thinned crystalline lens play important roles in maintaining proportional expansion of the globe during eye growth and accelerated axial growth results when the crystalline lens can no longer decrease in power by thinning and stretching. The third hypothesis proposes that myopic eyes are relatively more hyperopic from the peripheral retina to the fovea so that when there are conflicting visual signals in the central and peripheral retina, the peripheral retinal signals dominate axial growth and central refractive development. Longitudinal data, obtained two years prior to the onset of myopia in children who ultimately become myopic, has demonstrated a significant increase in relative peripheral hyperopia, and a relatively more prolate shape. However, this hypothesis remains controversial. Clinicians have been searching for treatments to control the progression of myopia based on these hypotheses, however, few studies have shown clinically significant results.

Orthokeratology (ortho-k) is defined as the clinical technique that uses specially designed and fitted rigid contact lenses to reshape the corneal contour to temporarily modify or eliminate refractive error. It was first introduced in the early 1960s, but safety concerns and outcome unpredictability limited its use. Since the mid-1990s, the acceptance of ortho-k has significantly increased, mainly due to huge technological developments in the field of contact lenses, such as the availability of highly-permeable materials and the advent of advanced digital processing technology which uses computer assisted system to achieve optimal lens fitting. A number of recent reports have demonstrated “overnight ortho-k” to be effective for controlling the progression of myopia. In fact, several previous studies have reported the efficacy of ortho-k use in those with low to moderate myopia, however, few studies have directly examined the effects of spherical, reverse geometry ortho-k lens designs on axial length elongation in highly myopic children. The purpose of the current study was to assess the effectiveness of ortho-k contact lenses in Chinese myopic children with different degrees of myopia over 24 months.

METHODS

The medical records of children who came to our clinic for vision correction using spectacles or ortho-k were reviewed and pertinent data was retrieved. A total of 128 patients were included, 65 ortho-k treated subjects (ortho-k group) and 63 spectacle-wearing subjects (control group). Each group was designed to achieve 90% power to detect a minimum 0.18 mm (about 0.50D) difference in axial elongation in two years at the 5% level of statistical significance, using group standard deviation of 0.27 mm based on previous studies. The minimal required sample size was calculated to be 49.

Each group was further divided into three sub-groups based on the basic spherical equivalent refractive error (SER): low-myopia (−3.00D < SER < −0.50D), moderate-myopia (−6.00D < SER ≤ −3.0D) and high-myopia (SER ≤ −6.0D). The ortho-k group selection was based on the inclusion criteria. The medical records of all ortho-k patients seen in our hospital from January 2008 to February 2009 were examined and those that met the inclusion criteria were sorted out. About twenty subjects were then randomly selected for inclusion in each sub-group, according to basic SER. For the control group, we chose all outpatient refractive files that matched inclusion criteria during the same time period as ortho-k patients; about 20 control subjects were randomly each sub-group.

Inclusion criteria: Age subjects were 7–14 years of age, visual acuity had no other ocular diseases aside from refractive error and no keratoconus (confirmed by pre-treatment corneal topography) Refractive errors had an intraocular pressure (IOP) of <21 mmHg. Ocular health had an with-the- rule astigmatism (axes 180 ± 30) ≤ 1.50 D had a BCVA (best corrected visual acuity) ≤0.00 log MAR units in both eyes (Snellen equivalent to 20/20) had no binocular vision problems. Others no medications that might affect refractive development had no history of ortho-k or contact lens wear maintained regularly scheduled visits and completed the 2-year follow-up had no significant deviations during lens wear (criteria only for ortho-k group) discontinued lens wear a total of 30 days or less during the 2 years (criteria only for ortho-k group)

DISCUSSION

The data from the current study support the theory that ortho-k can reduces progression of myopia by
approximately half compared with traditional spectacle lenses. The major strength of the current study is the inclusion of a greater number of subjects with moderate and high myopia compared to previous studies, which allowed the effectiveness of ortho-k lens to be evaluated in those with different degrees of myopia. Cho et al. First reported that an increase in axial length of 0.29 mm in an ortho-k-treated group and of 0.54 mm in a spectacle group over a 2-year period. Since then, similar results have been obtained in several other studies. Walline et al. reported that the increase in axial length after 2 years was 0.25 mm in an ortho-k group and 0.57 mm in a control group. Kakita et al. and Santodomingo-Rubido et al. also reported differences in axial length increases between myopic children wearing ortho-k contact lenses and those wearing single-vision spectacles (0.39 mm vs 0.61 mm and 0.47 mm vs 0.69 mm, respectively), over a 2-year period. In a randomised study, Cho and Cheung reported slower axial elongation of 43% in low myopes. Chen et al. reported 52% slower increase in axial length with toric ortho-k. The change in axial length growth between the ortho-k and spectacle groups found in our study is reasonably consistent with previously reported studies, although variations in ethnicity, age and basic refractive error between studies likely affect the rates of myopic progression. The prevalence of high myopia (greater than −5.00 D) among Chinese adults (greater than 30 years of age) has been reported to be 2% to 5%, whereas the prevalence of high myopia (greater than −6.00 D) among Chinese children, aged 5 to 16, has been reported to be approximately 1.19%. Pathologic complications, poor vision quality and decreased quality of life are all associated with high myopia. Controlling the rate of myopic progression, thereby reducing the prevalence of high myopia, may result in fewer pathologic complications and improved quality of life. Since children with severe myopia have faster myopic progression in general, it is logical that they would benefit most from a treatment that retards myopic progression. However, information about treatments for high myopia is rare since most studies examining treatments for myopia had been performed in children with low to moderate myopia. In a small study, involving 20 highly myopic children (greater than −6.00 D), myopic progression was found to be significantly reduced after treatment with 0.5% atropine eye drops. A subsequent case-control study indicated that 1% topical atropine was effective in slowing myopic progression in moderately to severely myopic children (initial refractive errors: −5.18 ± 2.05 D) at the end of 1 year of treatment.

Chen, Cheung and Cho reported no significant increase in axial length of two highly myopic, astigmatic subjects, with histories of myopic progression after they were treated with toric, ortho-k lenses.

A recent randomized study showed that ortho-k lenses effectively slowed myopic progression in high myopes. In that study, which axial length elongation was reported to be 63% slower in children treated with partial correction ortho-k lenses compared to children wearing spectacles. In the current study axial length elongation was found to be 46% slower in the high myopic ortho-k group compared with the spectacle group. Although full reduction was not achieved in the current study with current ortho-k lens designs, ortho-k was shown to be effective to slow myopic progression during the 24-month period of lens wear in subjects with low, moderate and high myopia.

Previous studies have reported that subjects with higher baseline SERs benefited the most from ortho-k treatment. However, in this study, subjects with all degrees of myopia demonstrated similar therapeutic benefits from ortho-k, specifically in retarding axial growth. The results of the current study are in agreement with previous studies in that there is a significant negative correlation between initial age and the change in axial length after 24 months of ortho-k treatment. This result is supported by observations in 3 other recent studies. Hence, we concurred with Cho and Cheung that younger myopic children will benefit more from ortho-k treatment than older myopic children.

The annual axial elongation in the current study in high myopia group was 0.16 and 0.18 mm in the first and second years, respectively, in the ortho-k subjects, and was 0.34 and 0.27 mm, respectively, in the control subjects. Our results had little difference with the annual growth in the first year as reported by Charm J and Cho, whose results showed relatively better myopic control in the first year of the study period (80% slower) compared with the second year (38% slower), while the value in current study was only 53% in the first year and 33% in the second year. This difference may be due to the different inclusion criteria in age of the two studies (8–11 years of age in Charm J and Cho’s study and 7–14 years of age in our study). But the tendency of reduced myopic control effect in high myopia was same and this phenomena was also occurred in low and moderate myopia in current study. This may be due to the slowing of myopic progression in the control group. Another explanation may be the adaptation of subjects to the signal that slows myopic progression in the ortho-k group.
However, information on the effectiveness of ortho-k was only available over a 2-year period. It remains to be seen whether ortho-k lenses should be worn continually, what treatment duration will optimize the reduction in myopic progression. Further studies are needed to address these questions.

One limitation of this study is that this was a retrospective study. Factors may affect myopic progression, such as peripheral refractive status, accommodative lag, pupil size, retinal image quality, a history of parental myopia, were not recorded in either group. A second potential limitation is that, although there were already some articles about the short-term changes in ocular biometry after discontinuation of orthokeratology, it is unknown whether the rate of axial elongation will be maintained after cessation of ortho-k treatment or whether a rebound phenomenon will occur as reported in the atropine study. Further studies, including a longer follow-up period after cessation of treatment are required to answer these questions (especially in high myopia). Third, only one ortho-k lens spherical design was used in our study.

There are a number of different lenses aimed at controlling myopia in moderate to high astigmatic children, such as the toric reverse geometry lens, which provides good lens centration on toric corneas. Further investigation is warranted to address the long-term safety and myopia control efficacy in these specially designed ortho-k lenses.

CONCLUSION

In conclusion, ortho-k contact lens wear is a promising strategy for reducing myopic development in myopic children. Elongation of axial length compared with subjects wearing spectacles was slower by 49%, 59% and 46% for low, moderate and high myopia during 2-year period. Ortho-k treatment would be more beneficial to younger myopic children. Early initiation of ortho-k treatment may be possible to reduce the prevalence of high myopia.

REFERENCES

Orbital Schwannomas

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ABSTRACT
Schwannomas are encapsulated, benign, slow growing tumors arising from the nerve sheath, which occur rarely in the orbit. The nerves of origin are the trigeminal (ophthalmic or maxillary division) and its branches, oculomotor, trochlear, abducent, and ciliary to name a few. Symptoms depend on their location; causing a mass effect, proptosis, diplopia, or optic nerve dysfunction. We present two unusual cases, both ladies; who ultimately were diagnosed on histopathology. One lady presented with right axial proptosis and optic neuropathy, and underwent excision biopsy via lateral bulbar conjunctival orbitotomy, with preservation of visual function. The other lady presented with a right superomedial sub-brow mass in the region of the supratrochlear nerve, which was completely excised with no recurrence at sixteen months. Schwannomas should be considered in the differential of any well-defined orbital mass, and early diagnosis and surgical excision yields good results.

INTRODUCTION
Schwannomas, also known as neurilemmomas or neurinomas, are very rare nerve sheath tumors, accounting for only 1-6% of all orbital tumors.1,3 These are usually well-circumscribed, oval, benign, slow-growing, and non-invasive tumors, but rarely may be found to be malignant. A common site is the superior orbit, but deeper tumors may cause proptosis, diplopia, optic neuropathy, and pressure effects.3 Radiological imaging is necessary for diagnosis, but definitive diagnosis requires histopathology.4 Surgical excision using microsurgical techniques yields a good outcome and complete excision usually prevents recurrence.2,5 We present two unique cases of orbital schwannomas, both in young ladies, who were surgically managed and their histopathology took us by surprise, due to the rarity of these lesions.

CASE-1
A 29 year old lady presented to the out-patient department of Fauji Foundation Hospital, Rawalpindi, with gradually progressive proptosis of the right eye for the past three years, and deteriorating vision and periorbital pain for the past six months. She did not have any significant previous ocular or systemic history.

Her vision was 6/9 OD, corrected to 6/6 with + 0.75 DS; and 6/6 OS. Colour vision testing with Ishihara colour plates was normal. She had moderate axial proptosis of her right eye with Hertel Exophthalmometry values 18 mm OD and 8 mm OS. [Figure 1. a-c] Resistance to retropulsion was positive. Slit lamp examination revealed normal anterior segments. There was a right grade 1 relative afferent pupillary defect, with optic disc swelling, hyperemia, choroidal folds, and venous engorgement. IOP was 16 mm Hg OD and 10 mm Hg OS. The left eye was normal. Extraocular motility was normal. Cranial nerve examination and systemic examination was also normal. Humphrey perimetry 60-4 showed an asymmetric bitemporal hemianopia. B-scan ultrasound revealed a postero-medial solid and cystic retrobulbar mass measuring 21 x 23 x 21mm = 5.2 ml, with minimal flow on colour Doppler.

Contrast enhanced CT scan Orbit revealed a hyperdense, intraconal mass, making indistinct interface with medial and superior rectii, and superior oblique muscles causing splaying. Optic nerve was displaced infero-laterally with slight widening of the optic foramen. Heterogeneous mild to moderate contrast enhancement was seen. [Figure 2 a-b]

Contrast enhanced MRI of the Orbits and Brain showed a well-defined, lobulated intraconal mass measuring 2.1 x 3.2 x 1.7 cm (TR x AP x CC) in the right orbit, hypointense to white matter on T1WS, heterogeneously hyperintense on T2WS, showing significant contrast enhancement, with a small, central, non-enhancing region. Optic nerve could not be visualized separately, and the mass displaced and stretched the medial and superior rectii. Posteriorly, it extended to the level of the optic chiasm; which was
uninvolved. A provisional diagnosis of an optic nerve glioma was made. [Figure 2 c-f]

The patient was referred to the Oculoplastics Department of Armed Forces Institute of Ophthalmology, where the mass was excised via a lateral bulbar conjunctival orbitotomy. The histopathology, however, surprised us all, when it was reported to be composed of spindle shaped cells with round to spindle nuclei forming Verocay bodies; pointing to a very rare tumor: Orbital Schwannoma, of the optic nerve.

Post-operatively, she developed a ptosis and third nerve palsy, which resolved in a few weeks. Twenty one month’s post-operatively, her vision is 6/6 OU, IOPs were 14 mm Hg OU, disc edema resolved, and Hertel readings 10 mm OD and 8 mm OS. A recent MRI shows a small residual mass which was left behind to preserve vision. [Figure 3 a-c] She is on follow up for any growth of the mass with serial MRIs.

CASE-2

A 19-year-old lady presented to our out-patient department with a slowly, growing, painless mass in her supero-medial orbit below the medial brow area [Figure 4 a-b]; for the past one year. There was no co-morbid systemic condition. The mass was firm, non-tender, and lobulated in consistency on palpation. VA was 6/6 OU, both anterior and posterior segments were normal. Radiographs of the orbit showed no deep extension or bony abnormality. Although, the consistency was unusual, we deemed it to be a superficial dermoid cyst.

We proceeded with excision of the mass via a sub-brow incision, which showed a pink, firm, multilobulated, smooth mass (2.2 x 1.5 x 0.7 cm) which was sent for histopathology, the result was surprising [Figure 4c]. The lesion exhibited a dimorphic growth pattern; with cellular (Antoni A) areas with spindle cells having nuclear palisade, and hypocellular (Antoni B) areas having loosely arranged cells in a myxoid matrix [Figure 5]; indicating a Schwannoma! The tumor was arising from the supratrochlear nerve as indicated by its location. Two year and three months post-operatively, the patient is happy, with no cosmetic issues and no signs of a recurrence [Figure 4d].

Figure 1:

a. Right axial proptosis (Primary position)

Figure 2:

a. Axial CT scan showing the right optic nerve schwannoma as a hyperdense, intraconal mass
b. Coronal CT scan showing the mass
c. Coronal T1WS MRI showing the well defined mass, hypointense to white matter
d. Coronal T2WS MRI showing the mass, heterogeneously hyperintense to white matter
e. Axial T1WS MRI showing the retrobulbar, intraconal fusiform mass
f. Axial T2WS MRI showing the schwannoma

Figure 3:

a. Axial T1WS MRI showing the residual schwannoma
b. Axial T2WS MRI showing the tumor
c. Coronal T1WS showing no mass

d. Axial T2WS MRI showing the schwannoma

Figure 4:

a. Right supero-medial orbital mass below the brow
b. Lateral view of the mass
c. Excised mass showing well-circumscribed, multi-lobulated structure
d. Post-operative appearance at one year
DISCUSSION

Schwannomas are benign nerve sheath tumors originating from Schwann cells, which are derived from the neural crest. The nerves involved in the orbit are the sensory nerves of the ophthalmic and maxillary divisions of the trigeminal nerve, and motor nerves supplying the extra-ocular muscles, oculomotor, abducens, and trochlear; supraorbital, supratrochlear, infraorbital, ciliary, and rarely, nerves within the extraocular muscles. Even rarer is the optic nerve schwannoma. They occur in young to middle aged adults (20 to 60 years) and are more common in females. 10-15 % tumors are associated with Neurofibromatosis. Malignant transformation is very rare.

These are slowly progressive tumors causing a variety of ocular symptoms depending on their location within the orbit. They may present with painless proptosis, dystopia, ptosis, eyelid edema, motility restriction, visual loss due to optic nerve compression and disc edema. Rarely, they may involve the adjacent paranasal sinuses, and anterior cranial fossa.

Radiographic investigations are helpful in diagnosis but these tumors have variable features. B-scan ultrasound shows schwannomas to be well-circumscribed, smooth, round to oval mass, with heterogeneous areas if cystic, with low to medium internal reflectivity on A-scan. CT scanning reveals smooth, well-defined, oval or fusiform masses, which may show mucinous degeneration or sometimes cystic areas. MRI shows well-demarcated, fusiform, heterogeneous masses, with cellular regions iso- or hyper-intense to muscle on T1-weighted images, and hyperintense to muscle on T2-weighted images; showing moderate to marked enhancement with gadolinium. Cystic areas show low signal. Peripheral enhancement should be regarded as a target sign.

Histopathological studies are confirmatory, revealing alternating Antoni A and B areas; the former showing solid cellular areas with nuclear palisading (Verocay bodies) in highly differentiated tumors, and the latter being loose, myxoid, areas with haphazardly arranged cells.

Treatment of orbital schwannomas is complete excision with microsurgical techniques. Sometimes, they can be stripped off the nerve with preservation of function. Even with partial excision, recurrence is rare. Radiotherapy is another option but increases the risk of secondary malignancies. The surgical techniques could be anterior, or lateral orbitotomy or combined with trancranial approaches depending on the location. Multisession gamma knife surgery is a new and effective option for therapy of such orbital lesions especially near the optic nerve.

The first case was presumed to be an optic nerve glioma, but excision of the mass revealed the correct diagnosis, with full recovery of vision and ocular motility. A residual mass was left behind to preserve visual function with residual minimal proptosis. There is no enlargement at twenty one months postoperatively. The patient is on close follow up.

The second case was presumed to be a superficial dermoid, even though the consistency on palpation was multilobulated. The mass was completely excised, to reveal an astonishing diagnosis of a supraorbital nerve schwannoma. There is no sign of recurrence at a two year and three month follow up. Although rare, these should be considered in the differential of all well-circumscribed orbital masses. Early diagnosis and surgical excision is the key to prevent permanent sequelae.

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4. Moloney G, Brewer J, O’Donnel BA. ‘Ancient’ schwannoma of
Orbital Schwannomas


FOREIGN BODIES: BROKEN MANDIBLES OF THE HALF BEAK FISH

A 52-year-old man presented with ptosis with limited ocular movement and eyelid elevation since 4 weeks. He developed this condition after colliding with a halfbeak fish while he was swimming in the Red Sea beach. (the halfbeak fish belong to the family of Hemiramphidae, live in shallow waters at the coastal areas.) MRI revealed a granuloma in the upper eyelid near the anterior upper orbital region, with no foreign body visible. During surgical exploration of the granuloma, two transparent tubular structures pointing toward the orbital apex were detected and extricated. Now these foreign bodies are the broken mandibles of the half beak fish, which after piercing the lid have immobilized thelevator and the superior rectus muscle. Within 3 months after surgery, the ptosis and the ocular motility resolved completely.

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Comparison of Surgically Induced Astigmatism in Manual Small Incision Cataract Surgery & Phacoemulsification Surgery

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ABSTRACT
Objective: Conventional Extracapsular cataract surgery (ECCE), Manual small incision cataract surgery (MSICS), and Phacoemulsification are the three popular forms of cataract surgery in Pakistan. Common complications such as surgically induced astigmatism, hyphema and striate keratopathy are important causes of poor uncorrected visual acuity after cataract surgery and by knowing how to minimize it we can improve visual outcome of cataract surgery. Surgically induced astigmatism (SIA) is still a common obstacle for achieving excellent uncorrected visual acuity. In this study it was meant to find out that if postoperative astigmatism in MSICS and Phacoemulsification techniques is comparable than we can encourage our trainees to do MSICS because most of trainees have to serve in periphery in their early carrier where Phacoemulsification equipment is not available. To compare mean surgically induced astigmatism in Manual Small Incision Cataract Surgery and Phacoemulsification surgery.

Materials & Methods: This was a randomized control trial. 214 patients were included in our study through our Out Patient Department (OPD) from 30th May 2014 till 30th December 2014 in Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Peshawar. Informed written consent was taken from every patient. Personal bio-data was recorded on predesigned proforma. First, patients were randomly allocated to a group by lottery method and subsequent patients were alternatively allocated to other group by consecutive sampling into Phacoemulsification surgery group and manual small incision cataract surgery group. Concomitant astigmatism was measured by Helmholtz keratometer (Topcon OM-4) (k values were taken in diopter). All patients were operated by two experienced using manual small incision cataract surgery technique and Phacoemulsification. Corneal astigmatism was measured pre-operatively then at 6th week post-operatively in both groups with the same keratometer. Using pre-op 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: Mean age for Phacoemulsification surgery group was 61.8±4 yrs and 60.7±3.5 yrs for MSICS group. More patients were present in age group 56-60 yrs for both groups. Pre-operative mean astigmatism was 0.5240, 0.5440 for Phacoemulsification group and MSICS group respectively. Post-operative mean astigmatism was 0.792, 0.8242 for Phacoemulsification group and MSICS group respectively. P value for these astigmatism was 0.8058, 0.6922 for pre-operative and post-operative mean astigmatism respectively. Surgically induced mean astigmatism was 1.1 D±0.9 D, 1.2±0.8D for Phacoemulsification surgery group and MSICS group respectively, P=0.393, which was statistically not significant hence there was no difference in these two surgery groups.

Conclusion: Manual small-incision cataract surgery is comparable to Phacoemulsification for the rehabilitation of the patient with cataract at 6 weeks. Manual small-incision cataract surgery is safe and nearly as effective. Small-incision surgery does not need the capital investment and recurring expenditure of a Phacoemulsification machine. So if we encourage our trainees to take interest in MSICS, so that their patients can enjoy early visual rehabilitation at low cost.

Key Words: Astigmatism; Surgically Induced Astigmatism; Manual Small Incision Cataract Surgery; Extra capsular cataract extraction; Keratometry.

INTRODUCTION
Cataract is the main cause of treatable blindness worldwide, with the developing world harboring three quarters of blindness. In total, the number of people with visual impairment (which includes both low vision and blindness) is therefore estimated to be 314 million worldwide in which cataract has remained the major cause of blindness globally.¹ Blindness and visual impairment are more common in developing countries than in industrialized countries, but information on associations with poverty is limited. Cataract is the most common cause of blindness in Pakistan, and cataract surgery is a highly cost effective intervention.² The goal of cataract surgery is to restore the best possible uncorrected visual acuity and minimum postoperative astigmatism and accumulating evidence indicates that expedited cataract surgery is effective in significantly enhancing vision.³ Surgically induced astigmatism (SIA) is still a common obstacle for achieving excellent uncorrected visual acuity. SIA is related to the incision

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length as higher in long than short size incision.\textsuperscript{4} According to a study the average astigmatism was 0.7 diopter (D) in the Phaco and 0.88 D in the MSICS (\textit{P} = 0.12).\textsuperscript{3}

**MSICS is safe and nearly as effective as Phacoemulsification. It does not need the capital investment and recurring expenditure of a Phacoemulsification machine. If we encourage our trainees to take interest in MSICS, patients can enjoy early visual rehabilitation at low cost.**

A study done in United Kingdom shows that 79.5\% patients had 0.5 D or less astigmatism in Phacoemulsification surgery.\textsuperscript{6} According to a study surgically induced astigmatism in manual small incision cataract surgery is 37.5\%\textsuperscript{7} and in phacoemulsification surgery is 68.7\%.\textsuperscript{8} 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.\textsuperscript{9}

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. The MSICS technique provided more stable corneal biomechanical properties than standard coaxial Phacoemulsification one month postoperatively.\textsuperscript{10} There are, however, many regions, possibly harboring the major load of cataract blindness in the world today, where Phacoemulsification is not cost effective. This is because of the density of cataracts involved, the cost and maintenance demands of the equipment, but a safer procedure with less amount of complication.

Nowadays there is a growing trend in developing countries towards suture-less 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. Unfortunately limited comparative data exists in our region regarding SIA in Phacoemulsification and MSICS. As MSICS is an alternative technique to Phacoemulsification in developing countries so more insight is needed, therefore this study is designed to see and compare the amount of astigmatism in phacoemulsification cataract surgery and MSICS.

Rationale of our study was that if postoperative astigmatism in MSICS and Phacoemulsification techniques is comparable than we can encourage our trainees to do MSICS because most of trainees have to serve in periphery in their early carrier where Phacoemulsification equipment is not available and people of that location cannot afford the costs of this procedure.

**MATERIALS & METHODS**

Patients were selected through Out Patient department after taking informed written consent. Personal biodata was taken on predesigned Performa. Corneal astigmatism was measured by Helmholtz keratometer (Topcon OM-4) (k values was taken in diopter). First patient was randomly allocated to a group by lottery method and subsequent patients was alternatively assigned to groups by systematic sampling. Patients wer divided into two groups;

Group A- MSICS group.

Group B- Phacoemulsification group.

All patients were operated by two experienced surgeons using both manual small incision cataract surgery technique and phacoemulsification. All surgeries were performed under peribulbar anaesthesia. In MSICS 8mm scleral incision 1.5mm away from the limbus and center at 12o’clock position was given. In phacoemulsification surgery at 3.2 mm corneal incision centered at 12 o’clock was given. In MSICS hard posterior chamber intraocular lens was used, while in phacoemulsification foldable posterior chamber intraocular hydrophobic lens was used. Intracameral antibiotics was injected in all patients after the procedure being done. Corneal astigmatism was measured pre operatively then at 6\textsuperscript{th} week post operatively in both groups using same keratometer.

**Inclusion Criteria:**

1. Primary age related cataract in patients 50-70 yrs.
2. Both gender were included.
3. Cataract was diagnosed on slit lamp examination.

**Exclusion Criteria:**

1. Eyes with corneal opacities, anterior synechiae, pterygium, corneal degenerations or dystrophies were excluded from our study on slit lamp examination.
2. Eyes with history of any previous surgery or with complications during surgery like (vitreous loss or iris prolapse) were also excluded.
3. Cases in which suture had to be applied to secure the wound integrity or in which combined surgery
is needed like trabeculectomy together with cataract extraction were also excluded. The above mentioned factors act as confounders and if not excluded can create bias in study.

**RESULTS**

Two hundred and fourteen patients above 50 years of age were diagnosed as age related cataract and fulfilling the inclusion criteria were included in this study. One hundred and seven (50%) were allocated in Phacoemulsification group and 107 eyes (50%) in Manual small incision surgery (MSICS) group. This study was conducted at KIOMS Hayatabad Medical Complex, Peshawar from 30th May 2014 till 30th December 2014. The minimum age at which the patient presented was 50 years while the oldest patient was 71 years of age. Mean age in phacoemulsification group was 61.8 ± 4 years and 60.7 ± 3.5 in MSICS. More patients were in 56-60 years age group, being more in MSICS than Phacoemulsification group and also more than 50-55 years age group Table No.1. On application of chi square test on Table No.1 there was no statistically significant difference in age groups between Phacoemulsification group and MSICS group P=0.395. Male and female distribution is also given in Chart No.1 separately for Phaco group and MSICS group. Keratometries were performed on all eyes preoperatively and at 6th week follow up.

Pre-operative mean astigmatism ± standard deviation (SD) and post-operative mean astigmatism ± standard deviation (SD) is given in Table No. 2. On application of T test, there was no statistically significant difference observed in pre-operative mean astigmatism and post-operative mean astigmatism between Phacoemulsification and MSICS group (P=0.8058 for pre-operative mean astigmatism and P=0.6922 for post-operative mean astigmatism). Although mean astigmatism induced by MSICS group seem to be more than Phacoemulsification surgery group but this was not statistically significant Table No. 4. Surgically induced astigmatism (SIA) in two surgery groups is given in Table No. 3. SIA of 0-0.75D was in 49.2% in Phacoemulsification and 39.6% in MSICS group, but of 1-1.75D was more in MSICS group which was 41.2% as compared to Phacoemulsification group = 33.5%. After 2D SIA percentage greatly drops for both groups. Although this difference was not statistically significant P=0.514 Table No.3. Mean SIA in both groups was not statistically significant P=0.393 (Table No. 4) at 6th week follow up. There were different types of SIA in which ‘with the rule astigmatism’ being more common and was 69% in Phaco group and 57% in MSICS group Table No. 5. In about 21% of Phaco group and 25% MSICS group no astigmatism was induced by surgery Table No. 5. On application of chi square test in Table No.5 there was no difference observed in types of SIA between two surgery groups P=0.142. In gender wise distribution of SIA, there was also no difference in the two groups P=0.1459 Table No. 6. On application of chi square test on Table No. 7 shows that there was statistically significant difference in SIA groups between different age groups P=0.0000. More number of patients lies in age groups 50-55 years and 56-60 years, these patients have astigmatism which range from 0-1.75D. Less number of patients have astigmatism >2D.

<table>
<thead>
<tr>
<th>Age</th>
<th>Phacoemulsification Surgery</th>
<th>MSICS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-55 years</td>
<td>27 (12.6%) P = 0.08</td>
<td>30 (14%) P = 0.08</td>
<td>57 (26.63%)</td>
</tr>
<tr>
<td>56-60 years</td>
<td>40 (18.69%) P = 0.56</td>
<td>50 (23.36%) P = 0.56</td>
<td>90 (42%)</td>
</tr>
<tr>
<td>61-65 years</td>
<td>33 (15.42%) P = 1.59</td>
<td>20 (9.34%) P = 1.59</td>
<td>53 (24.76%)</td>
</tr>
<tr>
<td>66-70 years</td>
<td>3 (1.4%) P = 0.8</td>
<td>7 (3.27%) P = 0.8</td>
<td>10 (4.67%)</td>
</tr>
<tr>
<td>70 years</td>
<td>4 (1.86%) P = 2.00</td>
<td>0 2.00</td>
<td>4 (1.86%)</td>
</tr>
<tr>
<td>Total</td>
<td>107 (50%)</td>
<td>107 (50%)</td>
<td>214 (100%)</td>
</tr>
</tbody>
</table>

On application of chi square test P = 0.395, which shows that there was significant difference in age groups between two surgery groups.

**Table No. 1:** Distribution of patients in two surgical groups; Age wise

**Chart No. 1:** Gender Distribution
### Table No. 2: Preoperative and postoperative astigmatism in two surgery groups

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Phacoemulsification Group</th>
<th>MSICS Group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.5240</td>
<td>0.5440</td>
<td>0.8058</td>
</tr>
<tr>
<td>Std.Deviation</td>
<td>0.5456</td>
<td>0.6390</td>
<td></td>
</tr>
</tbody>
</table>

On application of T test P = 0.8058 and P = 0.6922 for preoperative and postoperative astigmatism in Phacoemulsification and MSICS, which shows that there was no significant difference in astigmatism in these two groups.

### Table No. 3: Surgically induced astigmatism (SIA) distribution in two surgery groups

<table>
<thead>
<tr>
<th>Type of Surgically Induced Astigmatism</th>
<th>Phacoemulsification Surgery</th>
<th>MSICS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.75 D</td>
<td>39 (49.2%)</td>
<td>33 (39.6%)</td>
<td>72 (43.6%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.48</td>
<td>P = 0.45</td>
<td></td>
</tr>
<tr>
<td>1-1.75 D</td>
<td>27 (33.5%)</td>
<td>35 (41.2%)</td>
<td>62 (37.5%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.31</td>
<td>P = 0.29</td>
<td></td>
</tr>
<tr>
<td>2-2.75 D</td>
<td>12 (15.2%)</td>
<td>16 (18.7%)</td>
<td>28 (16.9%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.18</td>
<td>P = 0.17</td>
<td></td>
</tr>
<tr>
<td>&gt;3 D</td>
<td>2 (2.1%)</td>
<td>1 (0.5%)</td>
<td>3 (1.8%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.2</td>
<td>P = 0.19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80 (100%)</td>
<td>85 (100%)</td>
<td>165 (100%)</td>
</tr>
</tbody>
</table>

On application of chi square test P = 0.514, which shows that SIA groups have no significant difference in two surgery groups.

### Table No. 4: Mean surgically induced astigmatism (SIA) and Standard deviation in two surgery groups

<table>
<thead>
<tr>
<th>Surgically Induced Astigmatism</th>
<th>Phacoemulsification</th>
<th>MSICS</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.1 D</td>
<td>1.2</td>
<td>0.393</td>
</tr>
<tr>
<td>SD</td>
<td>0.9 D</td>
<td>0.8 D</td>
<td></td>
</tr>
</tbody>
</table>

On application of independent T test P value was 0.393 which was > than 0.05, hence the difference between surgically induced astigmatism in Phacoemulsification surgery and manual small incision cataract surgery was statistically un-significant.

### Table No. 5: Types of surgically induced astigmatism (SIA) in two surgery groups

<table>
<thead>
<tr>
<th>Types of Surgically Induced Astigmatism</th>
<th>Phacoemulsification Surgery</th>
<th>MSICS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>With the rule astigmatism</td>
<td>74 (69%)</td>
<td>61 (57%)</td>
<td>135 (63%)</td>
</tr>
<tr>
<td>Against the rule astigmatism</td>
<td>11 (10%)</td>
<td>19 (18%)</td>
<td>30 (14%)</td>
</tr>
<tr>
<td>No astigmatism</td>
<td>22 (21%)</td>
<td>27 (25%)</td>
<td>49 (23%)</td>
</tr>
</tbody>
</table>

On application of chi square test P = 0.142, which shows that there was no difference in types of SIA in two surgery groups.

### Table No. 6: Gender wise surgically induced astigmatism (SIA) distribution

<table>
<thead>
<tr>
<th>Surgically Induced Astigmatism</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.75 D</td>
<td>34 (15.88%)</td>
<td>38 (17.75%)</td>
<td>72 (33.64%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.11</td>
<td>P = 0.11</td>
<td></td>
</tr>
<tr>
<td>1-1.75 D</td>
<td>25 (11.68%)</td>
<td>37 (17.28%)</td>
<td>62 (28.97%)</td>
</tr>
<tr>
<td></td>
<td>P = 1.16</td>
<td>P = 1.16</td>
<td></td>
</tr>
<tr>
<td>2-2.75 D</td>
<td>18 (8.4%)</td>
<td>10 (4.67%)</td>
<td>28 (13.08%)</td>
</tr>
<tr>
<td></td>
<td>P = 1.14</td>
<td>P = 1.14</td>
<td></td>
</tr>
<tr>
<td>&gt;3 D</td>
<td>1 (0.46%)</td>
<td>2 (0.93%)</td>
<td>3 (1.4%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.17</td>
<td>P = 0.17</td>
<td></td>
</tr>
<tr>
<td>No astigmatism</td>
<td>29 (13.55%)</td>
<td>20 (9.3%)</td>
<td>49 (22.89%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.83</td>
<td>P = 0.83</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>107 (50%)</td>
<td>107 (50%)</td>
<td>214 (100%)</td>
</tr>
</tbody>
</table>

On application of chi square test P = 0.1459, which shows that there was no difference between SIA groups in gender.

### Table No. 7: Age wise surgically induced astigmatism (SIA) distribution

<table>
<thead>
<tr>
<th>Surgically Induced Astigmatism</th>
<th>Age 50-55 years</th>
<th>56-60 years</th>
<th>61-65 years</th>
<th>66-70 years</th>
<th>&gt;70 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.75 D</td>
<td>22 (10.28%)</td>
<td>30 (14%)</td>
<td>16 (7.47%)</td>
<td>3 (1.4%)</td>
<td>1 (0.46%)</td>
<td>72 (33.64%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.42</td>
<td>P = 0.00</td>
<td>P = 0.19</td>
<td>P = 0.04</td>
<td>P = 0.09</td>
<td></td>
</tr>
<tr>
<td>1-1.75 D</td>
<td>14 (6.54%)</td>
<td>30 (14%)</td>
<td>14 (6.54%)</td>
<td>3 (1.4%)</td>
<td>1 (0.46%)</td>
<td>62 (28.97%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.38</td>
<td>P = 0.59</td>
<td>P = 0.12</td>
<td>P = 0.00</td>
<td>P = 0.02</td>
<td></td>
</tr>
<tr>
<td>2-2.75 D</td>
<td>5 (2.33%)</td>
<td>15 (7%)</td>
<td>6 (2.8%)</td>
<td>2 (0.93%)</td>
<td>0</td>
<td>28 (13%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.81</td>
<td>P = 0.88</td>
<td>P = 0.13</td>
<td>P = 0.37</td>
<td>P = 0.52</td>
<td></td>
</tr>
<tr>
<td>&gt;3 D</td>
<td>0</td>
<td>0</td>
<td>1 (0.46%)</td>
<td>0</td>
<td>2 (0.93%)</td>
<td>3 (1.4%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.80</td>
<td>P = 1.26</td>
<td>P = 0.09</td>
<td>P = 0.14</td>
<td>P = 67.39</td>
<td></td>
</tr>
<tr>
<td>No astigmatism</td>
<td>16 (7.47%)</td>
<td>15 (7%)</td>
<td>16 (7.47%)</td>
<td>2 (0.93%)</td>
<td>0</td>
<td>49 (22.89%)</td>
</tr>
<tr>
<td></td>
<td>P = 0.67</td>
<td>P = 1.53</td>
<td>P = 1.23</td>
<td>P = 0.04</td>
<td>P = 0.92</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>57 (26.6%)</td>
<td>90 (42%)</td>
<td>53 (24.7%)</td>
<td>10 (4.67%)</td>
<td>4 (1.86%)</td>
<td>214 (100%)</td>
</tr>
</tbody>
</table>

On application of chi square test P = 0.0000 which shows that there was statistical difference observed in SIA groups between different age groups.
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 post surgical astigmatism along with earlier stabilization of refraction, visual acuity and early spectacle correction.11 MSICS technique was introduced by Ruit et al in 2000, and since then, this technique has grown in popularity in developing countries.12 The basic aim of this study is to compare mean surgically induced astigmatism in Manual Small Incision Cataract Surgery and Phacoemulsification surgery. Cataract surgery has transformed into a refractive surgical procedure. Incision location in cataract surgery 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.13,14 In a keratorefractive surgery it was seen that SIA as low as 0.75 D may leave a patient asymptomatic with visual blur, ghosting and halos.15

In a study conducted on 1500 patients mean SIA in MSICS at 6 weeks postop was found to be 0.3 D,16 another study showed a SIA of 0.69 D.17 In our study mean SIA at 6 weeks in Phacoemulsification surgery group was 1.1 ± 0.9 D which is comparable to earlier studies. In MSICS group mean SIA at 6 weeks was 1.2 ± 0.8 D, it can be seen here that Phacoemulsification group induced less mean SIA than MSICS group but this difference was statistically insignificant (P = 0.393). In a study of high-volume sutureless intraocular lens surgery in a rural eye camp in India, of 1190 cataract patients, 837 (70.3%) were operated by small incision, 230 (19.3%) by Phacoemulsification, and 105 (9.8%) by ECCE over 1 week. There was little difference in visual results or complication rates among the 3 techniques.18

In our study, SIA was calculated by subtraction method, it is seen that MSICS resulted in a higher SIA at 6 weeks. Exact cause is undetermined but it is possible that large incision in sclera as compared to Phacoemulsification resulted in a higher SIA in this group. When only mean astigmatism at 6 weeks was compared in both groups, they had nearly equal amount of astigmatism (1.1 D in Phacoemulsification surgery group vs. 1.2 D in MSICS group). In 2007, Ruit et al compared MSICS with Phacoemulsification, the average keratomatric SIA was 0.88D in the MSICS group and 0.70D in the Phacoemulsification group at 6th week (P =0.12) at 6 weeks.19

However another study by Jha and Vats showed that MSICS of 6 mm straight incision, report 85.5% of patients with SIA up to 1 D, with only 8.7% cases having SIA more than 2 D.20 In our study with the rule astigmatism was most common and was 69% in Phacoemulsification group and 57% in MSICS group. About 21% in Phacoemulsification group and 25% in MSICS group there was no change in astigmatism. In a study by Shakib Anwar a slight shift towards higher median WTR astigmatism with the passage of time was noted in patients undergone Phacoemulsification surgery.21 Different studies have demonstrated flattening of the cornea along the incisional meridian. This leads to WTR astigmatism which is comparable to our study.22,23,24 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.25 On application of chi square test on Table No. 5 showing types of astigmatism, P=0.142 which is not statistically significant. 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.26,27 There is a difference of opinion as to which type of astigmatism, if any, is preferable after cataract surgery. Some authors have suggested that residual with-the-rule astigmatism may favor better uncorrected distance acuity and is better tolerated visually,28,29 others believe that low myopic against-the-rule astigmatism provides better near UCVA compared to an equal amount of with-the-rule astigmatism.30

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 post-operatively.31 In our study, the magnitude of the preoperative astigmatism did not affect the magnitude of the post-op astigmatism at 6 weeks. Surgically induced astigmatism was higher in MSICS group, one possible cause of which can be large incision in sclera in
this group. Further research with astigmatism matched groups is required to provide a statistically significant association.

**CONCLUSION**

Manual small-incision cataract surgery is comparable to Phacoemulsification for the rehabilitation of the patient with cataract at 6 weeks. Manual small-incision cataract surgery is safe and nearly as effective. Small-incision surgery does not need the capital investment and recurring expenditure of a Phacoemulsification machine. So if we encourage our trainees to take interest in MSICS, so that their patients can enjoy early visual rehabilitation at low cost.

Although the results of this study are significant & 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.

**REFERENCES**

Comparison of Visual Outcome after Intravitreal Bevacizumab with Standard & alone Management Protocol in Branch Retinal Vein Occlusion

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Hayatabad Medical Complex, Peshawar.

ABSTRACT
Objective: To compare the visual outcome after Intravitreal Bevacizumab with standard management protocol and with the standard protocol alone in Branch Retinal Vein Occlusion.
Study Design: Randomized Controlled Trial
Duration & Place: This randomized controlled trial was conducted at Ophthalmology Department, Khyber Institute of Ophthalamic Medical Sciences, Postgraduate Medical Institute, Hayatabad Medical Complex, Peshawar. Duration of study was one year (from 24th March 2010 to 24th March 2011).
Materials & Methods: We included 40 subjects in each group with total number of 80 subjects. All patients were investigated for visual acuity, dilated fundus examination with slit-lamp biomicroscopy and 78 D for determining macular edema. Group 1 was intervention group in which each eye received monthly Intravitreal Bevacizumab injection followed by macular laser after 12 weeks. Group 2 was standard group in which the eyes were followed for 12 weeks without any intervention and at 12 weeks follow-up macular laser were applied.
Results: In our study, mean age was 58 years. 56% percent patients were male and 44% patients were females. For statistical analysis, Snellen Visual Acuity was converted to LogMAR Visual Acuity. Mean LogMAR Best Corrected Visual Acuity (BCVA) at presentation, 4, 8, 12 and 16 weeks in intervention group was recorded as 0.8, 0.6, 0.5, 0.3 and 0.3 respectively while in standard group it was found to be as 0.8, 0.8, 0.6, 0.5 and 0.3 LogMAR respectively. P-value at each follow-up was found to be 0.999, 0.0001, 0.04, 0.03 and 0.999 between the two groups.
Conclusion: Both groups show statistically similar results but combined treatment with Intravitreal Bevacizumab and macular grid photocoagulation provided good results in terms of faster recovery of lost vision and may be considered as an alternative therapy for ME in Branch Retinal Vein Occlusion.
Key Words: Avastin; Bevacizumab; Branch retinal vein occlusion; Grid laser; Laser photocoagulation; Macular edema.

INTRODUCTION
Retinal vein occlusion (RVO) is a vision threatening disorder and is the second most common disorder of retinal vessels after diabetic retinopathy.¹ The prevalence of RVO varies from 0.7% to 1.6%.² Among RVO, branch retinal vein occlusion (BRVO) is the most common disorder with a 10-year incidence of 1.2%.³ The commonest cause of visual loss in BRVO is macular edema (ME) which has been thought to be caused by fluid influx from vessels to tissues as a result of breakdown of blood-retinal barrier due to damage to tight junctions of endothelial cells, vitreoretinal adhesions and traction on the macula. Many vaso-permeability factors are produced in retina and released into the vitreous. Many cytokines and other factors have been postulated to be involved in pathogenesis of ME. Study suggests that in patients with BRVO, vascular endothelial growth factor (VEGF) and Interleukin-6 (IL-6) destabilize the endothelial cell tight junctions in response to retinal ischemia which results in leakage and subsequently ME.³

To compare the visual outcome after Intravitreal Bevacizumab with standard and alone management protocol in Branch Retinal Vein Occlusion, show statistically similar results but combined treatment with Intravitreal Bevacizumab and macular grid photocoagulation provides good results in terms of faster recovery of lost vision, may be considered as an alternative therapy for ME in Branch Retinal Vein Occlusion.

Different treatment modalities have been tried like anti-aggregative/fibrinolysis therapy, is ovoletic hemodilution, laser treatment, intravitreal/periorcular
application of steroids, arteriovenous crossing sheathotomy and vitrectomy. However, till date macular grid laser photocoagulation is the only evidence based and most effective treatment for ME secondary to BRVO. A study has reported that the results of single laser treatment with a significant success rate in terms of visual outcome as 42% in patients with BRVO. Regarding management of BRVO, there was always an urge to seek for better treatment options which should be cost-effective and safe.

Anti-VEGF like bevacizumab was first approved to be used for metastatic colorectal cancer but has been used in diabetic retinopathy and central retinal vein occlusion without any published reports of drug related toxic effects on retina. Various studies have reported that intravitreal bevacizumab (IVB) shows promising results in BRVO. Ahmadi AA et al showed significant success rate in terms of visual outcome as 74% in patients with BRVO. In the critical period of three months after BRVO onset, no standard intervention is available to combat associated ME. Severity of ME is related to increase levels of VEGF. ME in BRVO if persists for long period can ultimately result in irreversible damage to photoreceptors.

To our knowledge there has been no such published study which has compared the two treatment options in our population. So, by determining the effect of IVB in BRVO and if effective we may have an alternate treatment option which has added benefit in terms of visual outcome. Therefore we designed this study in which we can compare the added effect of IVB versus standard management protocol alone in terms of visual outcome in patients with ME secondary to BRVO. IVB decreases the ME by reducing the progress of ongoing inflammatory process. It also has the advantage that intervention can be initiated as early as possible to decrease macular edema and ultimate photoreceptor damage instead of waiting for three months as per standard management protocol.

MATERIALS AND METHODS

Setting: Department of Clinical Ophthalmology, Khyber Institute of Ophthalmic Medical Sciences, Hayatabad Medical Complex, Peshawar.

Duration of Study: One year (from 24th March 2010 to 24th March 2011).

Study design: Randomized controlled trial.

Sample Size: We included 40 subjects in each group with total number of 80 subjects.

Sampling Technique: Consecutive (non-probability) sampling.

Inclusion criteria:
1. All patients with BRVO presenting within two months of symptoms and was diagnosed clinically by slit-lamp biomicroscopy with 78 D lens.
2. Patients of both genders with age of 35 years and above.

Exclusion criteria:
1. Patients with BRVO secondary to retinal vasculitis.
2. Any diabetic patient with clinically significant macular edema and proliferative diabetic retinopathy.
3. Any patient with age related macular degeneration.
4. Any patient who had received any other intervention like intravitreal triamcinolone acetonide (IVTA).

Eyes with co-morbidities like retinal vasculitis, clinically significant macular edema, proliferative diabetic retinopathy and age related macular degeneration were excluded because it may act like confounding variables and status of the macula and retina due to these conditions may be compromised, as it will add errors and compromise the proper assessment of response to our treatment.

Patients who had taken treatment like IVTA were excluded because IVTA decreases the ME. All the above mentioned pathologies and eyes may have visual outcome affected by these confounding variables and were excluded to avoid errors in outcome in our study.

Data Collection Procedure: This RTC was initiated after approval from institutional ethical committee and informed consents were taken from the patients. The data was collected by using a pre design proforma. Patients of BRVO were enrolled from the out-patient department (OPD) of ophthalmology unit. Patients meeting our inclusion criteria were randomly divided into two groups i.e. the intervention group (Group 1) and standard group (Group 2). All patients were assessed for visual acuity, BCVA and dilated fundus examination with slit-lamp biomicroscopy with 78D. Group 1 received IVB on presentation followed by 4 weekly injections for first 12 weeks after onset of BRVO. VA and dilated fundus examination was carried out on every follow-up. FFA was performed at 12 weeks for status of ME and if present with VA ≤ 6/12 or less macular grid laser treatment was performed. Group 2 eyes were managed as per standard management protocol for BRVO. The IVB was given in operation theatre under sterile conditions (1.25 mg/0.05ml). Before injecting, the 5% providone iodine solution was applied to conjunctival sac. Opsite and speculum applied to the eye and IVB was injected through pars plana inferotemporally. While taking the needle out, cotton bud was applied to tamponade the entry point and then topical
antibiotics was given for 5 days, four times a day. In case of complications like neovascularization at the disc (NVD), neovessels elsewhere (NVE) or anterior segment neovascularization (ASN), during the follow up scatter laser was performed accordingly. Bias was controlled by restriction and the exclusion criteria were followed to control the confounders in the study.

Data analysis: All the collected data was analyzed in SPSS software version 17 with the help of tables, graphs and charts. Means and standard deviation was given for continuous variables like age. Male to female ratio was calculated. Frequency of categorical variables like VA, BCVA, FFA and scatter laser indication was calculated in the two groups. P-value was generated using chi square test for comparison of categorical variables which are VA, BCVA, FFA, follow-up and scatter laser indication and student T test for continuous variables which is interval between BRVO onset and presentation. A P-value of < 0.05 was considered significant.

RESULTS

This study included 80 eyes of 80 patients, which were divided into two groups. Forty eyes were included in intervention group and 40 eyes in standard group. Age distribution among 80 patients was recorded as; 35 (44%) were found in age ranged 51-60 years followed by 32 (40%) patients of more than 60 years old and 13 (16.25%) patients were less than 50 years old. Mean age was 58 years with standard deviation 0.23.

Gender distribution among 80 patients was recorded. Forty five (56%) patients were male and 35(44%) patients were females. The interval between onset of BRVO among 80 patients was analyzed as 8(10%) patients presented between 1-14 days, 34 (43%) patients presented between 15-28 days, 26 (32%) patients presented between 29-42 days, 12 (15%) patients presented between 43-60 days.

For statistical purpose, Snellen’s BCVA was converted to LogMAR (log of minimal angle of resolution). BCVA at presentation and 16 weeks follow-up is shown in table I and II respectively. Table III shows the comparison of mean BCVA between the two groups throughout the study at different follow-ups. Best Correct Visual acuity (BCVA) at presentation between two groups was analyzed in intervention groups n=1(2%) patients had BCVA LogMAR score 0.0, n=1(2%) patients had BCVA LogMAR score 0.2, n=4 (10%) patients had BCVA LogMAR score 0.3, n=6 (15%) patients had BCVA LogMAR score 0.5, n=8 (21%) patients had BCVA LogMAR score 0.6, n=12 (30%) patients had BCVA LogMAR score 0.8, n=4 (10%) patients had BCVA LogMAR score 1.0, n=2 (5%) patients had BCVA LogMAR score 1.3 and n=2 (5%) patients had BCVA LogMAR score 3. While in standard groups n=1(2%) patients had BCVA LogMAR score 0.0, n=1 (2%) patients had BCVA LogMAR score 0.2, n=4 (10%) patients had BCVA LogMAR score 0.3, n=6 (15%) patients had BCVA LogMAR score 0.5, n=8 (21%) patients had BCVA LogMAR score 0.6, n=12 (30%) patients had BCVA LogMAR score 0.8, n=4 (10%) patients had BCVA LogMAR score 1.0, n=2 (5%) patients had BCVA LogMAR score 1.3 and n=2 (5%) patients had BCVA LogMAR score 3.

Best Correct Visual acuity after 16 weeks follow-up was analyzed in intervention groups n=4 (10%) patients had BCVA LogMAR score 0.0, n=8 (21%) patients had BCVA LogMAR score 0.2, n=14 (35%) patients had BCVA LogMAR score 0.3, n=8 (20%) patients had BCVA LogMAR score 0.5, n=3 (8%) patients had BCVA LogMAR score 0.6, n=1 (2%) patients had BCVA LogMAR score 0.8, n=1 (2%) patients had BCVA LogMAR score 1.0, n=1 (2%) patients had BCVA LogMAR score 1.3. While in standard groups n=3 (8%) patients had BCVA LogMAR score 0.0, n=7 (18%) patients had BCVA LogMAR score 0.2, n=12 (30%) patients had BCVA LogMAR score 0.3, n=8 (20%) patients had BCVA LogMAR score 0.5, n=4 (10%) patients had BCVA LogMAR score 0.6, n=3 (8%) patients had BCVA LogMAR score 0.8, n=1 (2%) patients had BCVA LogMAR score 1.0, n=1 (2%) patients had BCVA LogMAR score 1.3 and n=1 (2%) patients had BCVA LogMAR score 3.

<table>
<thead>
<tr>
<th>Visual Acuity BCVA (LogMAR)</th>
<th>Intervention Group n=40</th>
<th>Standard Group n=40</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>1(2%)</td>
<td>1(2%)</td>
<td>2</td>
</tr>
<tr>
<td>0.2</td>
<td>1(2%)</td>
<td>2(5%)</td>
<td>3</td>
</tr>
<tr>
<td>0.3</td>
<td>4(10%)</td>
<td>3(7.5%)</td>
<td>7</td>
</tr>
<tr>
<td>0.5</td>
<td>6(15%)</td>
<td>8(20%)</td>
<td>14</td>
</tr>
<tr>
<td>0.6</td>
<td>8(21%)</td>
<td>5(12.5%)</td>
<td>13</td>
</tr>
<tr>
<td>0.8</td>
<td>12(30%)</td>
<td>13(32.5%)</td>
<td>25</td>
</tr>
<tr>
<td>1.0</td>
<td>4(10%)</td>
<td>3(7.5%)</td>
<td>7</td>
</tr>
<tr>
<td>1.3</td>
<td>2(5%)</td>
<td>3(7.5%)</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>2(5%)</td>
<td>2(5%)</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

n= number of eyes, LogMAR= Log of minimal angle of resolution, %= percentage, BCVA= Best corrected visual acuity, S.D.= Standard deviation Chi Square Test was applied. (P value = 0.999)
**Comparison of Visual Outcome after Intravitreal Bevacizumab with Standard & alone Management Protocol in Branch Retinal Vein Occlusion**

**Table 2**: BCVA at 16 weeks (n=80)

<table>
<thead>
<tr>
<th>16 Weeks BCVA (LogMAR)</th>
<th>Intervention Group n=(40)</th>
<th>Standard Group n=(40)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>4(10%)</td>
<td>3(8%)</td>
<td>7</td>
</tr>
<tr>
<td>0.2</td>
<td>8(21%)</td>
<td>7(18%)</td>
<td>15</td>
</tr>
<tr>
<td>0.3</td>
<td>14(35%)</td>
<td>12(30%)</td>
<td>26</td>
</tr>
<tr>
<td>0.5</td>
<td>8(20%)</td>
<td>8(20%)</td>
<td>16</td>
</tr>
<tr>
<td>0.6</td>
<td>3(8%)</td>
<td>4(10%)</td>
<td>7</td>
</tr>
<tr>
<td>0.8</td>
<td>1(2%)</td>
<td>3(8%)</td>
<td>4</td>
</tr>
<tr>
<td>1.0</td>
<td>1(2%)</td>
<td>1(2%)</td>
<td>2</td>
</tr>
<tr>
<td>1.3</td>
<td>1(2%)</td>
<td>1(2%)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>0(0%)</td>
<td>1(2%)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

n= number of eyes, LogMAR= Log of minimal angle of resolution, % = percentage, BCVA= Best corrected visual acuity, S.D.= Standard deviation, Chi Square Test was applied. (P value = 0.999)

**TABLE 3**: Mean Visual Outcome (n=80)

<table>
<thead>
<tr>
<th>Mean Visual Outcome</th>
<th>Intervention Group Mean (SD)</th>
<th>Standard Group Mean (SD)</th>
<th>P value in T Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>0.8 (±0.24)</td>
<td>0.8 (±0.24)</td>
<td>0.999</td>
</tr>
<tr>
<td>4 Weeks</td>
<td>0.6 (±0.21)</td>
<td>0.8 (±0.24)</td>
<td>0.0001</td>
</tr>
<tr>
<td>8 Weeks</td>
<td>0.5 (±0.20)</td>
<td>0.6 (±0.22)</td>
<td>0.04</td>
</tr>
<tr>
<td>12 Weeks</td>
<td>0.3 (±0.18)</td>
<td>0.5 (±0.20)</td>
<td>0.03</td>
</tr>
<tr>
<td>16 Weeks</td>
<td>0.3 (±0.18)</td>
<td>0.3 (±0.18)</td>
<td>0.999</td>
</tr>
</tbody>
</table>

n= number of eyes, S.D.= Standard deviation

**DISCUSSION**

BRVO is not uncommon especially when predisposing pathologies like glaucoma, hypertension, diabetes are prevalent in the community. There have been many treatment options previously described in literature like macular grid laser, vitrectomy and arteriovenous Sheathotomy, isovolemichemo dilution, intravitreal Triamcinolone acetonide and intravitreal anti-VEGF agents like Bevacizumab and Ranibizumab.4,11

Although there is a wide range of treatment options yet none of them is up to the satisfaction of patient or for treating ophthalmologist with their limitations and side effects. Till date, grid laser photocoagulation has been the gold standard treatment for ME in patients with BRVO as per recommendation for Branch Vein Occlusion Study Group which published its results in 1984.4 Although it is said that these results have not been clearly surpassed by any other treatment in similar level designed studies, but now newer agents like anti-VEGF have shown promising results. Also, Food and Drug Administration (FDA) approval of these agents have added the armamentarium of ophthalmologists in treating BRVO and has opened the minds of researchers to compare the two treatment options. In our study most of the patient (76%) were in age range 51-70 years and the mean age was 58 years. Almost similar results were found by Hirano Y et al in which (70%) were in age group 50-70 years and the mean age was 56 years.6

Salinas-Alaman et al observed that Intravitreal bevacizumab associated with grid laser photocoagulation decreased the central retinal thickness (CRT) assessed by optical coherence tomography (OCT) and improved the VA in patients with ME secondary to BRVO.17 They found that after the first IVB injection, a decrease in the macular edema and CRT was observed in all cases with an increase in the VA after grid laser photocoagulation as per BVOS study.17 We also observed the same results with each injection administered at 4 weeks interval followed by macular grid laser application with 16 weeks follow up. This improvement in BCVA was maintained in the third month through the remainder of the follow-up period in intervention group. In standard group, the BCVA deteriorated at 4 and 8 weeks follow up but with application of macular grid laser at 12 weeks the final BCVA in this group was comparable to intervention group. Thus, in our study of 4 months follow-up, we did not find results of intervention group superior to standard group. However, there may be formation of collaterals, variable amount of macular edema in both groups at presentation, the health of photoreceptors or retinal pigment epithelium (RPE) atrophy which may have acted as confounding factors.

The laser photocoagulation has been standard treatment option for macular edema secondary to BRVO for more than a decade. Patients had to wait for three months after BRVO onset in hope of spontaneous resolution of edema and hemorrhages and formation of collaterals. Then photocoagulation of macula had to be performed provided there was no macular ischemia as detected by FFA and BCVA is < 6/12. Although, results of macular laser were promising but only in those eyes who had ME and no macular ischemia. Laser stimulates the RPE pump mechanism, improves oxygenation of macula and clears the ME.17 Also, this treatment was not free of side effects like visual field loss, damage to photoreceptors and rarely macular
scaring or hemorrhages. This treatment option is costly and demands high expertise of the treating physician. In contrast, anti-VEGF is a selective VEGF receptor blocker and does not affect the health of photoreceptors and RPE, rather it helps in keeping the retinal cells healthy. Intravitreal injection does not demand high expertise of ophthalmologist and if performed under aseptic techniques then complication rate is very low as was in our case. We didn’t find any case of anterior chamber reaction, lens trauma, vitreous hemorrhage, retinal detachment, anterior or posterior segment neovascularization or endophthalmitis. However, we found transient rise of intraocular pressure (IOP) in 5% of cases immediately after IVB but that came to base line on next visit. Moreover, we would suggest that IVB treatment does not need to be delayed for months in hope of recovery of ME and hemorrhages as we have options which can be initiated immediately to decrease ME in early stage as persistent edema may damage photoreceptors.

By comparing the two groups, our study recorded that there was quick improvement in the BCVA in intervention group after the intravitreal Bevacizumab injections were initiated. While the standard group showed deterioration of BCVA on 4 and 8 weeks follow-ups until the last follow-up where there was improvement in BCVA. This fast recovery of BCVA in intervention group can be of high value when we are dealing with those patients who are very anxious and want quick recovery of their vision or also in those patients whose fellow eye has compromised visual status. Also, intervention may be a beneficial approach in those patients who have recurrence of BRVO in the same eye with already damaged photoreceptors.

Our study showed that in intervention group, there were 15% eyes who had BCVA of LogMAR 0.3 or better (Snellen’s BCVA = 6/12 or better), while at final follow-up, 65% eyes had the LogMAR 0.3 or better BCVA. In standard protocol group, BCVA (LogMAR 0.3 or better) was 15% at presentation and 55% patients had BCVA of LogMAR 0.3 or better at final follow-up. However, this difference in visual outcome between the two groups at final follow-up was statistically insignificant (p=0.999). Our final BCVA results were comparable to the results shown by Magargalet al.14

In the last decade, the results achieved with anti-VEGF drugs in age-related macular degeneration and the suggested role of VEGF in the development of ME secondary to vascular pathologies have led to a hypothesis about their effectiveness in similar retinal proliferative and edematous pathologies. Therefore, several studies have been reported to assess ranibizumab (Lucentis, Genentech Inc.), bevacizumab, and pegaptanib (Macugen, Pfizer / Eyetech Pharmaceutical) on ME in patients with BRVO.19

Most studies reported regarding anti-VEGF in BRVO were uncontrolled, non-randomized short case series, and it is impossible to make reliable comparisons among them. However, Campochiaro et al19, Brown et al20 in the BRAVO Study Group recently reported significant visual improvement with intravitreal ranibizumab compared to sham injection at 6 months, with a lower rate of rescue grid laser than controls and no increased adverse effects.19,20 Our study is an effort to compare the two treatment options and come up with an option which is efficacious as well as cost effective.

Currently anti-VEGF agents in clinical practice have average half-lives of about 20 days (range 11-50 days) and this is the reason for need to repeat them every month or 6th week. With more ongoing research and increase in the knowledge about relation between BRVO and VEGF, anti-VEGF is thought to be major factor in decreasing macular edema. Therefore anti-VEGF agents with longer half-lives and with long-lasting effects are eagerly awaited. In future, anti-VEGF agents with sustained release or with long half-life will certainly make treatment of BRVO safer by avoiding inherited risks associated with intravitreal injections.

**CONCLUSION**

Both groups show statistically similar results but combined treatment with IVB and macular grid photoocoagulation provided good results in terms of faster recovery of lost visual acuity and may be considered as an alternative therapy for ME in BRVO.

**REFERENCES**

Comparison of Visual Outcome after Intravitreal Bevacizumab with Standard & alone Management Protocol in Branch Retinal Vein Occlusion


SINUSITIS

Cerebral venous thrombosis can present with retrobulbar pain and vision changes. Risks for cerebral venous thrombosis include infections (sinus and ear), hypercoagulopathy, cancer, trauma, and the use of certain drugs. In this case, sinus infection can spread with direct extension or travel from mucosal veins to the venous sinuses.

D.D Diagnosis:
1. Dermatomyositis
2. Cancer
3. Oral contraceptive use
4. Facial trauma
5. Sinusitis
Causes of Blindness & Low Vision in Paediatric Age Group 4-15 years, at a Tertiary Eye Care Hospital

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Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Malir, Karachi

ABSTRACT

Aim: To determine the causes of blindness and low vision in children age from 4 – 15 years at Tertiary Eye Care Hospital.

Methods: It was observational, cross-sectional, descriptive type of study. The study was conducted at low vision clinic at paediatric eye department of Tertiary Care Hospital from 1st May, 2014 to April, 2015. All new and follow up patients aged from 4 – 15 years having visual acuity less than 6/18 to PL (Perception of Light) in better eye after medical or surgical treatment, or best available correction were included. The causes of low vision or blindness were classified according to main anatomical site of abnormality.

Result: The study included 223 children with low vision and blindness. Male were 67.26% and female were 32.74%. The majority was 11 years of age and above. There were eighteen (18) diseases causing low vision and blindness in children, of which nystagmus (13.45%) was commonest followed by maculopathy (11.21%) and Retinitis Pigmentosa (8.97%).

Conclusion: Low vision clinics are now a integral part of comprehensive eye care services. Every children need to examine regularly to diagnose low vision and its causes as early as possible. Nystagmus, Retinitis Pigmentosa, Maculopathy are mainly responsible for low vision in children. Ophthalmologists and Optometrists must be aware about the benefits and value of using low vision devices in children.

Key Words: Low vision, children, low vision devices, Nystagmus, blindness.

INTRODUCTION

Low vision and blindness are recognized as one of the major public health problems worldwide, especially in developing countries where 90% of blind live. Low vision is a bilateral subnormal visual acuity or abnormal visual field resulting from disorders in the visual system. A person with low vision is one who has impairment of vision even after treatment and / or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for planning and / or execution of a task.¹ The control of childhood blindness is priority of “Vision 2020 – the right to sight”, a global initiative for the elimination of avoidable blindness.²

The importance of providing care for children with low vision is recognized by many initiatives, such as Vision 2020, the 2004 Oslo workshop on low vision and the united Nations global campaign – “Education for All”.³ According to the WHO over 37 Million people are blind and 124 Million people have low vision worldwide.

Ophthalmologists and Optometrist must be aware about the benefit and value of using LVDs for children. School children need to be examined regularly to diagnose low vision and its causes as early as possible, as many causes are either preventable or curable at early stages.

About 70% of all blindness worldwide is believed to be avoidable.⁴ The prevalence of childhood blindness was 0.3 per 1,000 children in industrialized countries and 1.2 per 1,000 children in the developing countries in the year 2000. Accordingly, it was estimated that there were nearly 1.4 Million blind children in the world. Each year, an additional 50,000 children become blind and are added to this pool.⁵ It has estimated that very few people with low vision, possibly only 5 – 10%, actually use low vision rehabilitation services.⁶ Globally it is estimated that 285 Million people are visually impaired worldwide, 37 Million are blind and 246 Million have low vision. About 90% of world’s visually impaired live in developing countries, about 75% visual impairment is curable.⁷ Pakistan is trying
Causes of Blindness & Low Vision in Paediatric Age Group 4-15 years, at a Tertiary Eye Care Hospital

hard to achieve the goals of Vision 2020. There are 5 Million people are low vision patients in Pakistan crude prevalence of correction needed, functional vision in Pakistan 2.1%.

Visual impairment in children is associated with developmental delays and need for special educational, vocational, and social services often beyond the childhood into adulthood. This study aims to estimate the main causes of blindness and low vision in Pakistan children.

METHODOLOGY

It was an observational, cross-sectional, descriptive study conductive from 1st May, 2014 to April 2015 at low vision clinics in Al-Ibrahim Eye Hospital. Ethical approval was taken from the Ethical Committee of Isra Postgraduate Institute of Ophthalmology. Non-Probability purposive sampling was used for patient selection. All new and follow up patients with age from 03 Years to 15 Years with visual acuity less than 6/18 were included in this study, while patients age more than 15 Years, and patients whose visual acuity greater than 6/18 were excluded from this study. After informed written consent, the patients were selected from low vision clinics of Al-Ibrahim Eye Hospital. They were seen first by Ophthalmologist and then refer to low vision clinics for assessment, where they are refracted and assist for LVDs by an Optometrist.

Optometric examination included detailed history of patient, his/her family history, functional, occupational and clinical assessment. The anterior segment examination was performed using a slit-lamp. Posterior Segment examination was performed by direct and indirect Ophthalmoscopy after mydriasis. The diagnosis was confirmed by at least one Ophthalmologist and one Optometrist. Distance visual acuity was measured using a range of techniques. Those included Sheridn Gardiner, Snellen charts and logarithm of minimum angle of resolution (Log. MAR) chart with five optotypes on each line at 4 m and, if necessary, at 3.2 m on each eye separately while the patient wear his/her current spectacles (if worn). Illiterate E were used for patient who could not read English, depending on level of cooperation. If visual acuity couldn’t be measured with these charts, a sequential approach was used with fingers counting, hand movement, and light perception. Visual fields were assessed by confrontation and arc perimeter.

Refraction with cycloplegia was carried out on all patients, followed by subjective refraction using standard techniques. The best corrected distant and near acuity, refractive error and eye to chart distance were recorded for each eye. For near visual acuity “Near Reading Card for the partially sighted” and Lea Cards for near visual acuity were used. Low vision devices like telescope stand and hand magnifiers, and closed circuit television were used during the low vision assessment.

Data was entered on preformed proforma analysis was done using SPSS version 10 database Mean Values and standard deviation were calculated for continuous variables while proportions and percentages were calculated for categorical variables. P Value of less than 0.05 was considered as significant.

RESULT

In this observational cross-sectional, descriptive study, 223 patients were included according to inclusion and exclusion criteria. Out of these 223 patients, 150 (62.26%) were Male while 73 (32.74%) were Females. Mean age of the patients 11.43 ± 7.39 Years, with minimum age 4 Years and maximum age of 15 Years. In this study 18 diseases were reported to cause low vision and blindness in children (Table 1). Nystagmus was main cause of low vision, accounting for (13.45%) cases. Maculopathies was the second commonest cause accounting for (11.21%) cases followed stargdt’s disease and ocucutanous albinism (8.07% and 7.17% respectively) if classified anatomically, globe anomalies represented (71.4 %) of cases, followed by posterior segment, (25.3 %) and Anterior segment disorders (3.3 %). The majority of patients (130) had visual acuity ranging from less than 6/18 to 3/60, (55) cases presented with visual acuity between 2/60 to counting fingers (CF); (21) cases had visual acuity of hand movement (HM) or perception of light (PL) and (8) cases were totally blind. In 9 cases the vision could not be recorded due to non-cooperation.

The results of near visual acuity measurements show that 130 with low vision were able to discern 1 M (Newspaper print) or better, in the better eye without near addition 52 had near visual acuity less than 1 M to 3.2 M and 41 had less 3.2 M. After examination, low vision devices for distance were given to patients as follow; 138 patients were given distance glasses, 45 patients were given binocular and monocular telescope, 30 patients were given both distance glasses and telescopes. There was no improvement of vision in 10 patients with LVDs and rest of patients were kept under observation. Improvement of vision after using LVDs range from 2 to 4 lines on Snellen Chart. Low vision devices for near were given as follows; 86 patients improved by reading glasses, 36 patients improved hand held magnifier, stand magnifier, and dome magnifiers, 2 patients improved by both reading glasses and magnifiers.
Causes of Blindness & Low Vision in Paediatric Age Group 4-15 years, at a Tertiary Eye Care Hospital

### Table 1: Causes of blindness and low vision in children

<table>
<thead>
<tr>
<th>Causes of Blindness &amp; Low Vision</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nystagmus</td>
<td>30</td>
<td>13.45</td>
</tr>
<tr>
<td>Maculopathies</td>
<td>25</td>
<td>11.21</td>
</tr>
<tr>
<td>Retinitis Pigmentosa</td>
<td>20</td>
<td>8.97</td>
</tr>
<tr>
<td>Stargard’s disease</td>
<td>18</td>
<td>8.07</td>
</tr>
<tr>
<td>Oculocutaneous Albinism</td>
<td>16</td>
<td>7.17</td>
</tr>
<tr>
<td>Myopic Degeneration</td>
<td>15</td>
<td>6.73</td>
</tr>
<tr>
<td>Amblyopia</td>
<td>14</td>
<td>6.28</td>
</tr>
<tr>
<td>Congenital Cataract</td>
<td>14</td>
<td>6.28</td>
</tr>
<tr>
<td>Corneal Opacity</td>
<td>13</td>
<td>5.83</td>
</tr>
<tr>
<td>Micro-ophthalmos</td>
<td>12</td>
<td>5.38</td>
</tr>
<tr>
<td>Optic Neuropathy</td>
<td>10</td>
<td>4.48</td>
</tr>
<tr>
<td>Buphthalmos</td>
<td>8</td>
<td>3.59</td>
</tr>
<tr>
<td>Retinal Detachment</td>
<td>7</td>
<td>3.14</td>
</tr>
<tr>
<td>Anirida</td>
<td>5</td>
<td>2.24</td>
</tr>
<tr>
<td>Keratoconus</td>
<td>5</td>
<td>2.24</td>
</tr>
<tr>
<td>ROP</td>
<td>4</td>
<td>1.79</td>
</tr>
<tr>
<td>Coloboma</td>
<td>4</td>
<td>1.79</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>1.35</td>
</tr>
<tr>
<td>Total</td>
<td>223</td>
<td>100.00</td>
</tr>
</tbody>
</table>

DISCUSSION

Multiple studies have been carried out to identify different causes of blindness and low vision among children. Overall estimation indicated a very high prevalence of low vision and blindness the prevalence is greater in the rural population. Children with low vision can improve their quality of life through vision rehabilitation, services to teach them how to use their remaining vision more effectively. Using variety of visual and adoptive aids may bring them back or help them keep their independence. Integrated education of visually impaired children is now preferred when possible. Various studies have found that low vision devices as an effective means of providing visual rehabilitation. Children are said to have ‘Low vision’ or ‘Partial Sight’ when they have (a) Corrected Visual acuity in the better eye is less than 6/18 to ‘Perception of light’ or (a visual field of less than 10 degrees); and (b) The ability to use their residual vision to orientate themselves or to perform a task.

Nystagmus was the most common cause (30) of low vision in our study. The exact cause for this is unknown. The major cause of low vision and blindness in Indian children was the corneal scaring (26.4%), mainly due to Vitamin A deficiency, followed by Congenital anomalies (22.7%). In our study the number of male children is more than twice the number of female children (Fig: 1). Other studies undertaken by the Authors did show that the number of male is more than twice the number of female.

Girls have poorer accesses to low vision care than boys. Many factors may contribute towards the fewer female referral. These include comparatively small number of female patients examined in the outpatient department; very low literacy ratio in females; long distances involved for visiting the only low vision clinics in the province. Girls have poorer accesses to low vision care than boys. Many factors may contribute towards the fewer female referral. These include comparatively small number of female patients examined in the outpatient department; very low literacy ratio in females; long distances involved for visiting the only low vision clinics in the province.

Kello and Gilbert concluded that Vitamin A deficiency and measles were the major causes of severe visual impairment and blindness in children in the school for the blind. Most causes are preventable during childhood through provision of basic primary health care services while in our study Vitamin A deficiency have no significant cause of low vision. Another study reported that retinal disorders, with a frequency of (51.1%) were the most common cause of blindness. Amini reported that the most common diseases leading to blindness were retinal dystrophy followed by optic atrophy and congenital cataract in our study, retinal diseases were (55) Cataract (14) and optic atrophy was (10). Gebril reported that causes of blindness in children were Corneal Opacity is (70%) and cataract in (14%). Our one study reported that (40%) of preventable causes were seen in males and (60%) in females, thus the frequency of preventable causes was different in the two sexes. The frequency of treatable disease was (25.7%) based on etiology of blindness.

CONCLUSION

Ophthalmologists and Optometrist must be aware about the benefit and value of using LVDs for children. School children need to be examined regularly to diagnose low vision and its causes as early as possible, as many causes are either preventable or curable at early stages.
REFERENCES

Surgically Induced Astigmatism After Superotemporal & Superonasal Clear Corneal Incisions in Phacoemulsification

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Muhammad Faisal Fahim M.Sc, (Statistics)⁴
Al-Ibrahim Eye Hospital, Isra Post-graduate Institute of Ophthalmology, Gadop Town, Malir, Karachi

ABSTRACT
Objective: To evaluate surgically induced astigmatism (SIA) after superotemporal and superonasal clear corneal incision in phacoemulsification cataract surgery.

Material & Methods: This prospective study comprised of 88 patients, 49 right eyes and 39 were left eyes underwent phacoemulsification with foldable intraocular lens (IOL) through clear corneal incision (CCI). A superotemporal and superonasal incision was used in all right eyes and all left eyes respectively. Autorefractometer-keratometer was used to measure corneal astigmatism preoperatively and on 1st week, 6th week and 12th week postoperatively. 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 Holladay.²¹,²⁴

Results: The centroid of SIA was 0.30 ± 0.46 @ 79 for right eyes patients with superotemporal incision and 0.33 ± 0.44 @ 43 for left eye patients. The magnitude of postoperative astigmatism was slightly higher in superotemporal group (0.83 ± 0.58) than in superonasal group (0.78 ± 0.54). The magnitude of surgically induced astigmatism was lower in superotemporal group (0.84 ± 0.57) than in superonasal group (0.90 ± 0.46). There was no statistically significant difference in surgically induced astigmatism between two groups at 12th week of follow up (p>0.05).

Conclusion: we found that there is no statistically significant difference in SIA between either superotemporal incisions in the right eyes or superonasal incision in the left eyes (Student T test: p> 0.05).

Key Words: Phacoemulsification, clear corneal incision size, Surgically induced Astigmatism.
performed by the same surgeon on topical anaesthesia achieved with proparacaine hydrochloride eye drops 0.5% (ALCAINE-Alcon). The incision was located superotemporally in all right eyes and superonasally in all left eyes. Three- step 1.75 mm- 2.0 mm clear corneal tunnel incision was made with a 2.8 mm blade microsurgical knife (Kai Industries Co., Seki, Japan).

Phacoemulsification was performed with a CataRhex Oertli) phacoemulsifier The foldable acrylic IOL XL Stanbi Sky (CT Sp wheris-203P) (Ziess) was implanted in the capsular bag.

All the incisions were left sutureless. Patients were given Dexamethasone and Moxifloxacin eye drops qid, and the regimen was tapered over two months postoperatively. Auto refracto-keratometer was used to measure corneal astigmatism pre and postoperatively after 1st week, 6th week and 12th week postoperatively.

The data was calculated with computer based software SIA calulator version 2.1. As suggested by Dr. Holladay the software utilizes the Cartesian coordinates based method. Student t-test used for statistical analysis. A p value <0.5 was considered statistically significant.

RESULTS

The magnitude of preoperative astigmatism was 0.59 ± 0.38 in superotemporal group and 0.61 ± 0.35 in superonasal group. [Table-1]. The magnitude of postoperative astigmatism was higher in superotemporal group (0.83 ± 0.58) than in superonasal group (0.78 ± 0.54). The magnitude of surgically induced astigmatism was lower in superotemporal group (0.84 ± 0.57) than in superonasal group (0.90 ± 0.46) (p>0.05).

Analysis of the SIA centroids [Table-2] shows that Surgically induced astigmatism in the superotemporal group was 0.30 ± 0.46 X 79° whereas in superonasal group was 0.33 ± 0.44 X 43°(p>0.05).

The area of ellipse [Table-3] and the radius of circle [Table-4] for SIA was 1.46 and 0.68 in superotemporal group, 1.38 and 0.66 in superonasal group respectively those shows little differences (p>0.05).

<table>
<thead>
<tr>
<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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<td>Mean postoperative magnitude</td>
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<td>Mean SIA magnitude</td>
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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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<td>Mean postoperative centroid</td>
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<td>Mean SIA centroid</td>
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<th>Table 3</th>
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<tr>
<td>Area of ellipse</td>
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<tr>
<td>Preoperative</td>
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<tr>
<td>Postoperative</td>
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<td>SIA</td>
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<th>Table 4</th>
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<tr>
<td>Radius of circle</td>
</tr>
<tr>
<td>Preoperative</td>
</tr>
<tr>
<td>Postoperative</td>
</tr>
<tr>
<td>SIA</td>
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</table>
Surgically Induced Astigmatism After Superotemporal & Supronasal Clear Corneal Incisions in Phacoemulsification

Figure 2

Superotemporal (Right Eye)
Post-op

Figure 3

Superotemporal (Right Eye)
S/A

Figure 4

Superonasal (Left Eye)
Pre-op

Figure 5

Superonasal (Left Eye)
Post-op

Legend:
- Equal to 1 D
- Less than 1 D
- Greater than 1 D
DISCUSSION

Phacoemulsification through tunneled clear corneal incisions (CCI) have been reported to produce minimal SIA.\textsuperscript{1-3,8,12,14} To minimize the change in corneal refraction a self-sealing clear corneal incision of 3.0-3.5 mm in width and 1.7-2.0 mm in length can be designed.\textsuperscript{1,3,18,20} In this study all the surgeries were performed by single surgeon with 3.0 mm three step superotemporal tunneled clear corneal incision for all right eyes and superonasal for all left eyes. There was no statistically significant difference in magnitude (table-1), centeoids (table-2), area of ellipse (table-3) and radius of circle (table-4) for surgically induced astigmatism between two groups at 12th week of follow up (p>0.05).

Results for the clear corneal incisions used here in comparative data, are consistent with those recently reported in the literature by Rainer G et al\textsuperscript{1}, Ermis SS et al\textsuperscript{17} and Yoon JH et al.\textsuperscript{18} Modern surgical equipments and skills in modern cataract surgery have been advanced gradually. That decreased wound stress and stretching of cornea can make a smaller SIA.\textsuperscript{18} Placing of incision superotemporal and superonasal for right and left eye respectively, is covenant for surgical manipulation in anterior chamber.\textsuperscript{17,18} Therefore this study supports use superotemporal and superonasal tunnelled clear corneal incision for phacoemulsification.

CONCLUSION

We found that there is no statistically significant difference in Surgically Induced Astigmatism (SIA) between either superotemporal incisions in the right eyes or superonasal incision in the left eyes (Student T-test: p>0.05).

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Surgically Induced Astigmatism After Superotemporal & Superonasal Clear Corneal Incisions in Phacoemulsification


SCHWANNOMA

A 19-year-old girl presented with a slowly, growing, painless mass in her supero-medial orbit below the medial brow area for the past one year. There was no co-morbid systemic condition. The mass was firm, non-tender, and lobulated in consistency on palpation. VA was 6/6 OU, both anterior and posterior segments were normal. Radiographs of the orbit showed no deep extension or bony abnormality. Although, the consistency was unusual.

The mass was excised which showed a pink, firm, multilobulated, smooth mass (2.2 x 1.5 x 0.7 cm), was sent for histopathology, the lesion exhibited a dimorphic growth pattern with cellular (Antoni A) areas with spindle cells having nuclear palisade, and hypocellular (Antoni B) areas having loosely arranged cells in a myxoid matrix indicating a Schwannoma. DD.,Dermoid Cyst

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Is Post-Adenoviral Keratitis Avoidable / Preventable?

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Consultant Oculoplastic Surgeon & Strabismologist,
Mughal Eye Trust Hospital, Lahore, Pakistan

Aim: To find out whether post-adenoviral keratitis can be prevented by any therapy and what is its appropriate management, once it has occurred.

Materials & Methods: A prospective clinical study was conducted at a tertiary referral paediatric centre from March 2013 to June 2015. 220 consecutive cases of adenoviral conjunctivitis were included, between the ages 4 years to 36 years, (mean 15 years), with 95 females and 125 males. 114 cases presented with acute red eyes while 106 were chronic cases being treated elsewhere with topical antibiotics and steroids, but without any improvement. All 114 acute cases received artificial tears during the day, and a lubricant eye ointment at night. They were advised to avoid exposure to heat and sunlight, use ice-packs applied over closed eyelids at least 3-5 times during the day. They were reviewed on 3rd and 8th day after the start of therapy, and then weekly for 2 months. All treatment was stopped after 2 months. The 106 chronic cases were treated with Tacrolimus skin cream 0.03% twice a day applied in the lower conjunctival fornix and lubricating eye drops. They were examined weekly for 2 months and then monthly for 6 months. As the sub-epithelial infiltrates cleared up, the treatment was gradually tapered and discontinued after 4 months.

Results: All 114 acute cases showed improvement on the 3rd day and all signs of conjunctivitis cleared up within 2 weeks in all cases (96.5% improvement) but 4 developed sub-epithelial infiltrates which were treated with Tacrolimus. On further follow-up for 6 weeks, none developed post-adenoviral keratitis. The 106 chronic cases improved subjectively as well as objectively, after one week of therapy. After 3 weeks of therapy with Tacrolimus, infiltrates cleared up totally in all cases, 100% improvement. The treatment was continued for a further 2 months and no recurrences were noted for one month after stopping all therapy. No side effects of Tacrolimus were noted during this period.

Conclusion: Acute cases can be effectively managed with only lubricant eye drops without the need for topical antibiotics and steroids, which are not only unnecessary but prolong this self-limiting disease and promote the formation of sub-epithelial infiltrates. The post-adenoviral keratitis can be effectively managed with Tacrolimus without any side effects.

Key words: adenoviral conjunctivitis, sub-epithelial infiltrates, adenoviral keratitis, tacrolimus, topical steroids.

INTRODUCTION

Adenovirus was first discovered by Wallace P. Rowe in 1953 and up till now, 54 serotypes have been identified. It is responsible for epidemics of acute kerato-conjunctivitis during fall and winter months, where the patients, which are mostly children and young adults, also suffer from upper and lower respiratory tract infection, gastroenteritis and hemorrhagic cysts. This is because the adenoviruses are resilient to standard disinfectants used in schools, offices or hospitals. They are easily transmitted through droplets from eyes, respiratory tract or secretions contaminating a slit-lamp, tonometer, ophthalmoscope in an ophthalmic clinic by the process called viral shedding.

It starts as an acute conjunctivitis with a self-limiting course of 10 days to 2 weeks, but in a few cases, the cornea gets involved with the development of nummular opacities of corneal sub-epithelial infiltrates which can impair the visual function and persist for months to years. Currently, no specific antiviral therapy is available to shorten the course of the disease, to improve the distressful clinical symptoms, to stop the viral replication, and to avoid the development of corneal infiltrates.

Acute cases can be effectively managed with only lubricant eye drops without the need for topical antibiotics or steroids which are not only unnecessary but prolong this self-limiting disease and promote the formation of sub-epithelial infiltrates. The post-adenoviral keratitis can be effectively managed with Tacrolimus without any side effects.

It is important to understand its exact pathogenesis, so that an appropriate management can be planned. The viruses lack a cell wall and they need a host cell to flourish, hence they are obligatory intra-cellular parasites. Adenoviruses are DNA viruses.
with a single strand of DNA; after invading a host cell, they penetrate the nucleus and start replicating inside it. Once they have depleted all energy stores of the host cell, they cause its lysis, so newly formed viruses are ready to invade the neighboring host cells. The adenoviruses are shed into the tears from where they travel to the nose, throat and intestines causing rhinitis, sore throat, gastroenteritis. Similarly, they are transmitted to other people in close proximity to the patient via secretions (sneezing, coughing or tears). While they are replicating and invading other host cells, constitutes the incubation period of this disease, which lasts a few days.

Soon the stage of acute conjunctivitis starts which is due to an acute Type-I hypersensitivity reaction to the viral antigens (DNA). In this, the conjunctival mast cells degranulate and release abundant amount of histamine which causes vasodilation of conjunctival vessels and out-pouring of large amounts of fluid. This causes the symptoms of itchy, watery, extremely red eyes with swelling of eyelids and chemosed (edematous) conjunctiva. The discharge remains watery which is characteristic of this infection.

Then the viral antigens initiate the migration and proliferation of B (antibody producing) and T (killer cells) lymphocytes into the area. This results in the formation of follicles on the tarsal conjunctiva and cells) lymphocytes into the area. This results in the proliferation of B (antibody producing) and T (killer lymphocytes into the area. This results in the proliferation of B (antibody producing) and T (killer cells, constitutes the incubation period of this disease, which lasts a few days.

Another differential diagnosis is an Acute Chlamydia Conjunctivitis. This is a sexually transmitted disease and is seen in young adults. History of sexual contact may not always be forthcoming due to social reasons. However, the diagnosis may be confused with acute adenoviral infection as in both the follicular conjunctivitis is present but the discharge is mucopurulent, with a tender pre-auricular lymph node enlargement. The conjunctivitis starts unilaterally and may become bilateral. The patient and spouse both need to be treated with oral Erythromycin for 10 days and topical therapy for chlamydia for at least a month.

In adenoviral conjunctivitis, the cornea is not affected initially during the acute stage because of strong natural defence provided by isoymes, immunoglobulins and soluble mucins in the tear film which kill the invading microbes. The corneal epithelium is 5 cell-layer thick in which all cells are strongly adherent to each other by tight junctions, called desmosomes and hemi-desmosomes. The surface epithelial cells are flat and their outer walls have micovillae which are lined with mucins secreted by the conjunctival goblet cells. These mucins promote the adherence of tear film uniformly over the cornea and make the normally hydro-phobic corneal surface hydrophilic; with every blink, the tear film is replenished. Hence the multilayered corneal epithelium with the overlying tear film strongly inhibits bacterial or viral adherence and penetration into the intact corneal surface.

However, if this natural defence mechanism is compromised by injudicious use of antibiotics, the tear film gets disrupted, antibiotic toxicity results in micro-erosions of cornea and break down of desmosomes by the preservatives in antibiotic eye drops. The viral infection persists beyond 10 days, the surviving viruses adhere and penetrate the disrupted corneal epithelium into the stroma. The B lymphocytes are attracted to the corneal stroma and form antibodies against viral antigens. These antigen-antibody complexes initiate a Type IV hypersensitive reaction which is apparent as uniformly rounded, nummular, sub-epithelial corneal infiltrates with clear cornea in between them, during the third and fourth weeks of infection. They may be 2-20 in number. Histopathological examination has shown them to be composed of histiocytes, lymphocytes and fibroblasts along with a disruption of the collagen fibres of the Bowman layer.

Currently, no specific antiviral therapy is available to shorten the course of the infection, to stop the replication of adenoviruses or to avoid the development of sub-epithelial infiltrates which cause a
lot of visual morbidity. They are usually treated with strong topical steroids instilled frequently, to which the respond quickly. As the steroids have no direct antiviral affect and they block the migration of the killer T lymphocytes into the area, the adenoviruses persist for a long period of time and start inciting the formation of immune complexes as soon as the steroid therapy is stopped. Therefore, corneal infiltrates re-appear every time steroids are stopped so they have to be continued for a long period of time, resulting in a lot of side effects particularly a raised IOP and steroid-induced glaucoma.

Hence this study was conducted to see whether simple lubricants and icepacks help in shortening the course of this disease and prevent the formation of sub-epithelial infiltrates. Tacrolimus skin cream 0.03% (Ecczemus, Brooke Pharma) was used instead of topical steroids to see the response on post-adenoviral keratitis, thus totally avoiding topical steroids and their side effects.

MATERIALS & METHODS

This study was conducted at the tertiary referral paediatric/oculoplastic centre of Mughal Eye Trust Hospital, Lahore over a two years period, from March 2013 to June 2015. 220 consecutive cases of adenoviral conjunctivitis were included in the study, between the ages 4 years to 36 years, mean being 15 years. They included 95 females and 125 males. Out of the total of 220 cases, 114 presented with an acute onset of red eyes for 2-3 days while there were 106 chronic cases who had the red, irritable eyes for more than a month. All chronic cases had been treated elsewhere with broad spectrum antibiotic eye drops and topical steroids, but without any improvement.

The diagnosis of acute adenoviral conjunctivitis in 114 acute cases was made by a positive history of exposure to other family members or at school, the presence of acute chemotic conjunctiva or conjunctival injection in one or both eyes, a watery discharge, follicular as well as papillary reaction in the lower tarsal conjunctiva, a non-tender pre-auricular lymphadenopathy on the side of red eye and a clear cornea with absent corneal staining. The diagnosis was not confirmed with Polymerase Chain Reaction (PCR) which is a specific but an expensive test for adenoviral infection, due to economic consideration.

They all were prescribed artificial tears to be instilled cold (kept in the refrigerator) every hour or two hourly during the day, depending upon the amount of conjunctival injection and chemosis, and a lubricant eye ointment at night. A sick leave from school or work for a week was given and were advised to avoid exposure to heat and sunlight, use ice-packs applied over closed eyelids at least 3-5 times during the day. All were counselled that the condition may worsen over the next 48 hours and may involve the other eye as well if it wasn’t already affected. A follow-up review was done at the 3rd and 8th day after the start of therapy, and then weekly for 2 months. All treatment was stopped after 2 months.

In all 106 chronic cases, the diagnosis of adenoviral infection was confirmed by a history of exposure prior to the onset of infection, presence of conjunctival injection, a follicular reaction in the tarsal conjunctiva and sub-epithelial infiltrates 3-15 in number with rounded margins and clear cornea in between. 26 cases had a mild corneal staining overlying the infiltrates. Their antibiotic eyedrops were stopped; in a few patients who were still using topical steroids, they were gradually tapered and stopped over one week. They all were started on Tacrolimus skin cream 0.03% (Ecczemus, Brooke Pharma) applied twice a day with a cotton-bud into the lower conjunctival fornix, along with lubricating eye drops (Visol gel hourly, Atco Pharma) during the day and Lacrilube eye ointment (Allergen Pharma) at night. Any patient with a raised IOP was also given a beta-blocker eye drops twice a day. They all were examined weekly for the next 2 months and then monthly for a further 4 months. As the sub-epithelial infiltrates cleared up, the treatment was gradually tapered and discontinued after 2-3 months.

RESULTS

We evaluated the patients subjectively and objectively regarding the severity of inflammation at each visit. A clinical score was used for symptoms like lacrimation, itching, photophobia, and clinical signs like conjunctival hyperaemia, chemosis, superficial punctate keratitis (SPK), sub-epithelial infiltrates for both acute and chronic cases as shown in Table 1 & 2 respectively, (Grade 0 = absent, Grade 1= mild, Grade 2= moderate, Grade 3= severe). Out of the 114 acute cases, 110 showed improvement on the 3rd day and all signs of acute conjunctivitis cleared up within 2 weeks in all cases (96.5% improvement). However, 4 cases developed sub-epithelial infiltrates on the 10th day after the start of therapy. They were the ones who also had a sore throat. Only these 4 cases were started on Tacrolimus skin cream on the 10th day while the other 110 cases did not need any additional therapy. On further follow-up for 6 weeks, none of these developed post-adenoviral keratitis.

The 106 chronic cases improved subjectively after one week of therapy, with less ocular irritation, watering, photophobia and conjunctival hyperaemia.
Objectively, the sub-epithelial infiltrates started reducing in size. After 3 weeks of therapy with Tacrolimus, infiltrates cleared up totally in all cases, showing a 100% improvement. The treatment was continued for a further 2 months and no recurrences were noted for one month after stopping all therapy. No side effects of Tacrolimus were noted during this period. Only mild stinging was felt in 4 cases but none of the cases discontinued the therapy. After an adenoviral infection, patients usually develop a dry eye. Since lubricant eye drops during the day and ointment at night were continued in all cases, no patient complained of dryness or irritation as dry eye was affectively controlled by this therapy.

<table>
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<th>Symptoms</th>
<th>Grade</th>
<th>Prior</th>
<th>To</th>
<th>Rx</th>
<th>Grade</th>
<th>After</th>
<th>1 month</th>
<th>Rx</th>
<th>Improvement</th>
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<td>114</td>
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<td>Conj chemosis</td>
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<td>85</td>
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<tr>
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Table 1: Results following treatment in 114 acute cases

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<th>Grade</th>
<th>Prior</th>
<th>To</th>
<th>Rx</th>
<th>Grade</th>
<th>After</th>
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<tr>
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<tr>
<td>BCVA</td>
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<td>6/12=16</td>
<td>6/24=78</td>
<td>6/6=106</td>
<td>_</td>
<td>_</td>
<td>_</td>
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Table 2: Results of 106 Chronic cases after therapy

DISCUSSION

In this study, almost all cases presenting with an acute conjunctivitis started improving within 3 days of starting supportive therapy (lubricants and cold-sponging) to reduce histamine-mediated symptoms and signs like itching, watering, conjunctival hyperaemia and chemosis. Since the patients developing adenoviral conjunctivitis are generally healthy with a strong immune system, the body’s natural defence mechanism takes control of the invading viruses and
the whole disease process is over within a week - 10 days as shown in our study, (Table 1). Therefore there was really no need to add an immune modulating drug (steroids or Tacrolimus) at this stage. Since the antibiotics have no specific anti-viral affect, so they were also not used in any acute case. Only 4 cases out of the 114 acute cases developed acute sore throat and fever and soon afterwards, a few corneal (<10) sub epithelial infiltrates were noted. Hence they were started on Tacrolimus skin cream and within one week of the start of therapy, they resolved completely. We believe the general immunity of these cases was either low or the viral infection was too over-whelming for the natural immunity to handle.

A study conducted in New Zealand on rabbits' eyes inoculated with adenoviruses demonstrated that the duration of intra-cellular viral replication was 9 days, with a peak on the 3rd day. This constituted the incubation period of the disease. After this, cell lysis occurred and newly liberated viruses started the acute inflammatory response (histamine mediated). As the symptoms of AKC in the acute phase are caused by the host’s immune response, treatment with cyclosporin eye drops (which acts similar to Tacrolimus and suppresses the host’s immune response to viruses) in one group of rabbits and Cidofovir (a non-specific anti-viral drug) in another group was started soon after their inoculation with the virus. It was found out that Cyclosporin was more effective in reducing viral replication and acute manifestations of the disease. Then they both were started in 2 groups of patients 1 to 7 days (mean, 3.5 days) after the onset of symptoms, when patients first presented to the clinic. Cidofovir failed to reduce the severity of symptoms as the viruses had already replicated, invaded the host cells and initiated the immune response. On the other hand, cyclosporin was found to be more effective because of its suppressant affect on local symptoms caused by the host’s immune response. However, the earlier symptomatic improvement and a lesser incidence of corneal infiltrates with topical cyclosporin treatment warrants further investigation in a larger number of patients. It has been tried in other studies where the sub epithelial infiltrates cleared up within 4 months of therapy.

Both Tacrolimus and cyclosporin have the same mechanism of action, Tacrolimus being 10-100 times more potent than cyclosporin eye drops. It is a macrolide discovered in 1984 from streptomyces bacteria. Its anti-inflammatory affect is by suppressing the activation as well as proliferation of B and T lymphocytes and formation of inflammatory mediators like cytokines and interleukin 2. It has the added advantage of causing less ocular stinging and burning as compared to cyclosporin. In our study, it helped in clearing up already formed immune complexes in the cornea in all 106 chronic cases and blocked their further formation. They all showed a marked improvement in their symptoms within 1 week of start of therapy with Tacrolimus. The conjunctival inflammation as well as the sub-epithelial infiltrates cleared up within a month of therapy. Since recurrences with this disease are notorious, the therapy was continued for a further 6 weeks to 2 months and then stopped gradually. None of our cases developed any recurrence after stopping the therapy. No side-effects were noted in any case even after prolonged use of Tacrolimus skin cream 0.03% in the lower conjunctival fornix for 2 months. Our results are similar to the study conducted by Levinger et al which was a relatively small study on only 11 cases of adenoviral keratitis, all of whom cleared up with Tacrolimus 0.03% skin cream. Though its ophthalmic preparation is not available in Pakistan, the skin preparation has proven to be as effective and without any side effects as shown in a study conducted by the author on its usage in VKC.

This study proves the following facts:

1. Acute adenoviral conjunctivitis is a self-limiting condition. Our natural tear film and stratified squamous corneal epithelium are very strong defence mechanisms against viral adherence and penetration into the cornea, thereby preventing adenoviral keratitis.

2. Topical antibiotics should totally be avoided as they prolong the disease process by disrupting the tear film, damage the corneal epithelium, thus promoting SPK formation, viral adherence to the abraded epithelium and accelerating the formation of corneal sub-epithelial infiltrates, as witnessed in our study and they have no anti-viral affect. All 106 cases with a chronic red eye due to adenoviral infection also had keratitis for the same reason.

3. Topical steroids are totally unnecessary during the acute stage as all these patients are young and otherwise healthy, with a strong natural immunity.

4. By prolonging the acute stage of the disease and viral replication by injudicious use of antibiotics, viruses have a chance to mutate, resulting in emergence of resistant strains which are more virulent. Thus infection is not only prolonged in that particular patient but these resistant and virulent strains are transmitted to other people, resulting in widespread epidemics.

5. Tacrolimus has shown to be a safe and effective
steroid-sparing drug that should be used for adeno-viral keratitis.

6. Patients exhibiting signs of sore throat or gastroenteritis indicate a much severe adenoviral infection. In such cases, Tacrolimus should be started earlier in the acute phase of the disease, as soon as the patient presents to prevent keratitis (as seen in our 4 acute cases who developed keratitis which could have been avoided if Tacrolimus had been started earlier).

7. So let the nature take its course. Patients should be reassured that it is a self limiting condition, it may worsen for 48 hours and then start improving. They should be advised rest at home, avoid heat and sunlight, a good diet to boost up their immunity and avoid shaking hands or sharing towels with anyone.

CONCLUSION

Acute cases can be effectively managed with only lubricant eye drops without the need for topical antibiotics or steroids which are not only unnecessary but prolong this self-limiting disease and promote the formation of sub-epithelial infiltrates. The post-adenoviral keratitis can be effectively managed with Tacrolimus without any side effects.

REFERENCES


**Note:** Dr. Sameera is a distinguished ophthalmologist with a brilliant record of scientific research in the field of Ophthalmology as a dedicated scholar. She has achieved a prestigious place as a venerated academician in South Asia. She has made a significant contributions in the field of Ophthalmic Science, ameliorating the sufferings of the needy people. As a person she is a highly groomed lady with an air of charisma around her......... Editor
Massive Hemorrhagic Complications After Intravitreal Injection of Aflibercept in Patients with Presumed Polypoidal Choroidal Vasculopathy

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Edited by: Dr. Jahanzeb Durrani MS (Ophth)

ABSTRACT
Subretinal Hemorrhage (SRH) is a complication associated with intravitreal injections of anti-vascular endothelial growth factor for wet age-related macular degeneration (AMD). We recently experienced three cases of massive hemorrhage after intravitreal aflibercept injection (IAI) for wet AMD that was suspected to be polypoidal choroidal vasculopathy (PCV).

Case 1: A 75-year-old woman presented with decreased vision in her left eye. She had subfoveal choroidal neovascularization (CNV) that was suspected to be PCV. Two weeks after the second IAI, massive SRH developed. Although additional treatment was provided, her vision was reduced to counting fingers.

Case 2: A 67-year-old man presented with a history of wet AMD in his left eye. Subfoveal CNV, which was suspected to be PCV, was present in his right eye. Although three monthly injections of ranibizumab were given, the pigmented epithelium detachment (PED) was still present and IAI was started. One month after the first IAI, massive SRH was noted; two weeks later, vitreous hemorrhage developed. Although vitrectomy and additional bevacizumab injection were performed, his vision was reduced to counting fingers.

Case 3: An 81-year-old woman presented with a history of wet AMD in her left eye, which had been treated with several bevacizumab injections. She had bilateral subfoveal CNV and started IAI in her right eye; she initially refused treatment for her left eye. After two monthly IAIs in the right eye, SRH developed and progressed in the left; IAI treatment was thus expanded to both eyes. One month after IAI of her left eye, a thick vitreous hemorrhage developed. However, the patient refused further treatment.

Conclusion: The present study is the first case series of hemorrhagic complications after IAI for wet AMD that was suspected to be PCV. IAI is believed to be a potent treatment for wet AMD, especially with the PED; however, the risk of hemorrhagic complications should still be carefully considered.

Key words: Aflibercept; Polypoidal choroidal vasculopathy; Subretinal hemorrhage; Vitreous hemorrhage; Wet age-related macular degeneration.

INTRODUCTION
Age-related macular degeneration (AMD) is the leading cause of blindness in people over 50 years old. About 10% of patients with AMD have the neovascular form (wet AMD).1 Intravitreal anti-vascular endothelial growth factor (anti-VEGF) injection has become the standard therapy for wet AMD.

Aflibercept (Eylea; Regeneron, Tarrytown, NY, USA and Bayer HealthCare, Berlin, Germany) is a recently developed anti-VEGF agent that binds to members of the VEGF family, including VEGF-A and VEGF-B, as well as to placental growth factor.2 The efficacy of aflibercept for the treatment of wet AMD has been demonstrated1, and the binding affinity of intravitreal aflibercept to VEGF is known to be greater than that of bevacizumab or ranibizumab.3 Intravitreal aflibercept is reportedly effective in previously treatment-resistant wet AMD4, and it may be effective in reducing pigment epithelium detachment (PED).5

The case series is the first description of hemorrhagic complications after IAI for presumed PCV. Although IAI is believed to be a potent treatment method for wet AMD, especially with PED, the risk of hemorrhagic complications should be carefully considered.

Although the risk of complication after intravitreal anti-VEGF injection seems to be very low6, several reports have described hemorrhagic complications following anti-VEGF injection for wet AMD. We recently experienced three cases of massive subretinal or vitreous hemorrhage after intravitreal aflibercept injection (IAI) for wet AMD that was suspected to be polypoidal choroidal vasculopathy (PCV).
Massive Hemorrhagic Complications After Intravitreal Injection of Aflibercept in Patients with Presumed Polypoidal Choroidal Vasculopathy

Cases Report

Case 1:
A 75-year-old woman presented with decreased vision in her left eye (best-corrected visual acuity [BCVA] of 8/20). Fundus examination showed a yellowish subretinal membrane in her left eye (Figure 1A). Fluorescein angiography (FA) showed a well-demarcated hyperfluorescent spot in the superior nasal to foveal region in the early phase and diffuse hyperfluorescence of the macula in the late phase (Figure 1B and 1C). Optical coherence tomography (OCT) showed PED with subretinal fluid and a peak of PED arising from a flatter region at the site corresponding to the early hyperfluorescent area on FA, raising suspicion for a PCV-associated polyp (Figure 1D). We diagnosed the patient with neovascular AMD with suspicion for PCV and started treatment with IAI (2.0 mg per 0.05 ml).

One month after the first IAI, the subretinal fluid disappeared, but the PED remained. Two weeks after the second IAI, the patient visited our clinic complaining of decreased vision, and massive subretinal hemorrhage (SRH) was noted (Figure 1E). Although additional bevacizumab injections were given and pneumatic displacement was performed, her vision was reduced to counting fingers.

Case 2:
A 67-year-old man presented with a history of wet AMD in his left eye. However, a wet AMD lesion was also present in his right eye, which exhibited decreased vision (BCVA of 4/20). FA examination of his right eye revealed a diffuse hyperfluorescent area on the macula with blocked fluorescence as well as multiple brighter spots (Figures 2A, 2B). OCT showed PED notches with localized hyper-reflectivity underneath the dome, indicating a PCV-associated polyp; these notches also corresponded to the more brightly fluorescent spots (Figure 2C). Although three monthly injections of ranibizumab were performed in the right eye, the PED was still present, and some SRH developed without vision improvement (Figure 2D). Therefore, IAI (2.0 mg per 0.05 ml) was started. One month after the first IAI, the patient complained of decreased vision in his right eye, and massive SRH was noted (Figure 2E). Two weeks later, vitreous hemorrhage developed (Figure 2F). Despite vitrectomy and additional bevacizumab injections, the patient’s BCVA was reduced to counting fingers.

Case 3:
An 81-year-old woman presented with known wet AMD of her left eye. Her BCVA was 0.16 in the right eye and hand movement in the left eye. She had been treated with several intravitreal bevacizumab injections in her left eye. FA and OCT showed occult choroidal neovascularization (CNV) in her right eye. Her left eye exhibited a focal round hyperfluorescent lesion on the fovea with diffuse leakage at the macula in the late phase (Figures 3A-3C).

OCT examination of her left eye showed regions of bumpy PED and a PED peak arising from a flatter area, raising suspicion for a PCV-associated polyp (Figure 3D). Although we recommended treatment for both eyes, she refused treatment for her left eye because of its poor vision. Her right eye was treated with two
monthly IAI, but SRH developed and progressed in her left eye (Figure 3E). Thus, her left eye was also treated with aflibercept (2.0 mg per 0.05 ml). One month after aflibercept injection in her left eye, a thick vitreous hemorrhage developed (Figure 3F). However, the patient refused further treatment.

**Figure 3:** Ophthalmic examination in case 3. A. Fundus photography at the initial visit. B. Early-phase fluorescein angiography. C. Late-phase fluorescein angiography. D. Optical coherence tomography shows bumpy areas of pigment epithelial detachment and an area of peaked pigment epithelial detachment from a flatter region of pigment epithelial detachment, raising suspicion for a polypoidal choroidal vasculopathy-associated polyp (arrow head). E. Fundus photography three months after the initial visit. F. B-scan ultrasonography one month after aflibercept injection.

**DISCUSSION**

This is the first documented report of acute subretinal or vitreous hemorrhage after aflibercept injection for wet AMD that was suspected to be PCV. SRH is a complication that may occur after intravitreal anti-VEGF injection for wet AMD. One report estimated the incidence of SRH as 8.3/1000 patient-years after intravitreal ranibizumab injection. However, Goverdhan et al. reported that fresh submacular hemorrhage was seen in 4 of 53 patients (8%) after bevacizumab injection. Krishnan et al. reported that fresh submacular hemorrhage was seen in 4 of 14 patients (29%) after bevacizumab injection for large (≥ 15 mm³) occult CNV, while 0 of 22 patients showed submacular hemorrhage after ranibizumab injection. In another study of PCV, five cases of fresh SRH occurred among 54 patients (8.9%) after intravitreal ranibizumab injection.

We reviewed the incidence of SRH or vitreous hemorrhage after aflibercept or ranibizumab injection. From April 2014 to March 2015, we experienced 3 cases (16.7%) of massive subretinal or vitreous hemorrhage after IAI among 18 patients (47 injections). During the same time period, we treated 72 patients with neovascular AMD (209 injections) with ranibizumab and encountered only one case of massive SRH approximately three months after the injection. Calculation of the actual incidence of SRH in this study was impossible because of the small number of cases and large confidence interval. However, the incidence of subretinal or vitreous hemorrhage after IAI was not higher than that in previous reports.

SRH after anti-VEGF injection for wet AMD or PCV may occur as a consequence of the natural history of the disease. In particular, patients with PCV sometimes develop spontaneous massive SRH. Sudden vision deterioration secondary to SRH was observed in approximately 33% (14 of 42 eyes) in a report of the natural course of PCV over a one-year follow-up. However, the higher rate of massive hemorrhage after aflibercept injection (3 of 18 eyes) than after ranibizumab within one month of treatment cannot be explained only by the natural history.

Although the mechanism of massive hemorrhage after aflibercept injection remains unclear, the robust effect of aflibercept on abnormal choroidal vessels could contribute to the hemorrhage. One study reported that a significantly higher rate of submacular hemorrhage occurred following intravitreal bevacizumab for = 15 mm³ occult CNV than following intravitreal ranibizumab because bevacizumab has a longer half-life and more strongly influences contraction of the CNV membrane, resulting in rupture of blood vessels. Aflibercept has a half-life of 4.7 days in rabbits, and its binding affinity to VEGF is thought to be greater than that of bevacizumab or ranibizumab. Strong blood vessel contraction and subsequent hemorrhage can occur after IAI.

All three of the herein-described cases of massive hemorrhage after IAI have common features. First, they had large areas of CNV on FA (Figures 1B, 1C, 2A, 2B; and 3B, 3C). Second, they had = 3 mm diameter areas of PED with hyporeflectivity on OCT before IAI (Figures 1D, 2C, 2D and 3D). Third, they had signs consistent with polyps on OCT and were suspected to involve PCV (Figures 1D; 2C, 2D and 3D; white arrowheads), although PCV diagnosis was not confirmed by indocyanine green angiography (ICG). The lack of ICG images to confirm the diagnosis of PCV is a limitation of this case report. There is one case report of acute SRH after IAI for PCV with large PED. Other reports of SRH after anti-VEGF injection have suggested that large (≥ 15 mm³) CNV or PCV is associated with a higher rate of SRH, especially after bevacizumab injection. Therefore, the use of aflibercept, which has strong binding affinity and a long half-life, should be carefully considered when the CNV lesion has high-risk features for hemorrhage such as suspicion for PCV, a large CNV...
area, and large PED on OCT.

**CONCLUSION**

Case series is the first description of hemorrhagic complications after IAI for presumed PCV. Although IAI is believed to be a potent treatment method for wet AMD, especially with PED, the risk of hemorrhagic complications should be carefully considered.

**REFERENCES**

INTRODUCTION
Orbital lesions may be inflammatory, infectious, vascular, and benign or malignant tumors. Biopsy or excision may be needed for diagnosis, before definitive therapy can be planned. Based upon the histological diagnosis, treatment may require additional deep orbital surgery or alternative medical therapy. Lymphomas, for example are best managed with local radiotherapy and / or chemotherapy. Inflammatory lesions are managed with systemic corticosteroids. Infantile hemangiomas may not require treatment at all if no visual compromise exists, most of these will show some degree of spontaneous involution. The indications of orbitotomy are: biopsy of mass lesions, removal of orbital masses such as hemangiomas, schwannomas, dermoid cysts, mixed lacrimal gland tumors, debulking of more infiltrative lesions such as lymphangiomas, drainage of orbital abscesses and orbital haemorrhage.

A large number of innovative anterior surgical approaches have been developed over the years, and whenever possible, anterior approaches to the orbit are preferred to avoid the extra time and potential morbidity of bone removal and refixation. The lateral orbitotomy was first proposed in 1889 by Krönlein, later was modified by Berke in 1953, and by Maroon and Kennerdell in 1976. The lateral orbitotomy has been selected for tumors that located in the lateral, superior or inferior compartment of the orbit and for orbital decompression in patients with Graves’ ophthalmopathy.

Lateral orbital approach yields a high degree of success and few permanent complications. Visual function usually is improved, cosmetic appearance is enhanced, and life-threatening conditions can be eliminated.

MATERIAL & METHODS
In this descriptive study the patients were selected on non-probability purposive basis at Isra Post Graduate Institute of Ophthalmology, Al-Ibrahim Eye Hospital Malir Karachi, from Feb 2014 to July 2015. All the patients with orbital lesions where lateral orbitotomy is indicated were included. Patients previously undergone orbital surgery elsewhere were not included.

Operative procedure: After all anti septic measures, a traction suture was placed transconjunctivally.
beneath the insertion of the lateral rectus muscle that can be manipulated to help identify the belly of the lateral rectus posteriorly in the orbit. An S-shaped or a lateral canthotomy incision was made to incise the skin. Once the skin incision was completed, the orbicularis muscle was incised by using blunt and sharp dissection to expose periosteum overlying the lateral orbital rim.

Traction sutures were placed through the cut edges of the orbicularis muscle and clamped to the drape to provide exposure. The periosteum was incised with the No. 15 scalpel blade vertically along the lateral rim, and periosteal elevators were used to elevate periosteum to expose the bony rim. Elevation was carried superiorly to a point 1 cm above the zygomaticofrontal suture and inferiorly to the level of the zygomatic arch. Periorbita of temporal side was bluntly separated from the bone by using of gauze wrapped around a periosteal elevator. The periorbita along the medial surface of the lateral wall was similarly elevated posteriorly within the orbit so that the bony lateral orbital rim can be completely bared along its external and internal surfaces. After the periorbita had been elevated, a large malleable retractor was placed between the orbital contents and the medial surface of the lateral orbital rim to protect the orbital contents while a Wrigley saw was used to make two osteotomies. One was placed superiorly about 0.5 cm above the zygomatico-frontal suture. A second osteotomy was made inferiorly through the lateral rim just adjacent to the floor of the orbit above the zygomatic arch. The rim was removed and placed off the field in moist gauze. Periorbita opened with blunt-tipped scissors. The periorbita was retracted, and the lateral rectus muscle and lacrimal gland was identified. Deep orbital dissection was performed with the operating microscope to aid in identification of the vital vascular and neural structures within the orbit. After removal or biopsy of the proposed lesion, the orbital rim was reinserted and fixed. The periorbita and periosteum was repaired with prolene 6/0 suture, the orbicularis was re-approximated on the outer surface of the bone flap and was closed with vicryl 6/0 suture. The subcutaneous tissue and skin was closed with prolene 6/0 suture. A drain was placed for the surface of the bone flap and was closed with vicryl 6/0 suture. The subcutaneous tissue and skin was closed with prolene 6/0 suture, the orbicularis was re-approximated on the outer surface of the bone flap and was closed with vicryl 6/0 suture. The subcutaneous tissue and skin was closed with prolene 6/0 suture, the orbicularis was re-approximated on the outer surface of the bone flap and was closed with vicryl 6/0 suture. The subcutaneous tissue and skin was closed with prolene 6/0 suture, the orbicularis was re-approximated on the outer surface of the bone flap and was closed with vicryl 6/0 suture.

Postoperative care: Firm bandage was applied to all patients for 10-12 hours. Oral Ofloxacin 400mg BD for 5-7 days was given to adults. Augmentin (Amoxicillin + Calvulnic acid) was given according to weight to children and patients below the 20 years age. Low dose steroid (Prednisolone 0.5 mg/kg body wt) was prescribed to all the patients for 1 – 2 weeks (according to surgically induced inflammation); an equivalent dose of Dexamethasone was given intramuscularly for the hospitalized period.

Postoperative follow up: Visual acuity, pupillary reaction, color vision, extraocular movement and visual field by confrontation test were performed on 1st postoperative day and on each follow up. Any complication and other findings related to objectives were noted on every follow up.

RESULTS

All 16 patients completed their follow-up. Mean follow-up period was 9 months ranging from 3 to 15 months. The mean age of patients was 34 years ranging from 04 years to 60 years. In this study male (9) to female (7) ratio was 1.3:1. Most common presenting symptom was proptosis in 15 patients (93.75%) followed by decreased vision in 8 patients (50%) that was associated with (BCVA ranging from CF to 6/6 on Snellens chart), other symptoms and sign are as given in Table-1 and Table-2.

Intra-operative complication rate was 25% that is in 4 patients Table-3, contributed by intraoperative haemorrhage in 1 patients (6.25%), lateral rectus damage in 2 patients (12.50%), and failure to locate lesion in 1 patient (6.25%).

The postoperative complications were transient restriction of EOMs (in one or two gazes) in 2 patients (12.50%) that recovered over a period of 2 – 4 months, EOMs restrictions in all gazes in 1 patient (6.25%), muscle fibrosis in 1 patients (6.25%). Table-4. The loss or decrease of vision was not encountered in any patient. BCVA was improved in 9 patients (30%) and remained static in 19 patients (63.33%), pre-operative and post-operative visual acuity was not recorded in 2 children age group patients.

Table 1: Presenting symptoms of patients (n=16)

<table>
<thead>
<tr>
<th>Presenting Symptom</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proptosis</td>
<td>15</td>
<td>93.75%</td>
</tr>
<tr>
<td>Pain</td>
<td>2</td>
<td>12.50%</td>
</tr>
<tr>
<td>Diplopia (in primary gaze)</td>
<td>3</td>
<td>18.75%</td>
</tr>
<tr>
<td>Decreased vision (Range CF-6/6)</td>
<td>8</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 2: Presenting Signs of Patients (n=16)

<table>
<thead>
<tr>
<th>Presenting Symptom</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc edema</td>
<td>7</td>
<td>43.75%</td>
</tr>
<tr>
<td>Relative pupillary defect</td>
<td>5</td>
<td>31.25%</td>
</tr>
<tr>
<td>Restricted extra-ocular movements</td>
<td>10</td>
<td>62.25%</td>
</tr>
<tr>
<td>Choroidal folds</td>
<td>5</td>
<td>31.25%</td>
</tr>
</tbody>
</table>
Table 3: Intra-operative complications (n=16)

<table>
<thead>
<tr>
<th>Complication</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle damage (lateral rectus)</td>
<td>2</td>
<td>12.50%</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Failure to locate lesion</td>
<td>1</td>
<td>6.25%</td>
</tr>
</tbody>
</table>

Table 4: Frequency of post-operative complications (n=16)

<table>
<thead>
<tr>
<th>Complication</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient impairment of EOMs in one or two gazes</td>
<td>2</td>
<td>12.50%</td>
</tr>
<tr>
<td>EOMS restriction in all gazes</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Muscle fibrosis</td>
<td>1</td>
<td>6.25%</td>
</tr>
</tbody>
</table>

Table 5: Post-operative visual changes (n=16)

<table>
<thead>
<tr>
<th>Visual Changes</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual loss</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Remained stationary</td>
<td>9</td>
<td>56.25%</td>
</tr>
<tr>
<td>Improved</td>
<td>5</td>
<td>31.25%</td>
</tr>
<tr>
<td>• C.F – 6/6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>• 6/60 – 6/6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>• CF – 3/60</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>• 1-3 line on Snellen’s chart</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
*Visual acuity of 2 children was not recorded.

Table 6: Orbital lesions in this study (n=16)

<table>
<thead>
<tr>
<th>Orbital Lesions</th>
<th>No. of Patients</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacrimal gland tumours</td>
<td>5</td>
<td>31.25%</td>
</tr>
<tr>
<td>Hemangioma</td>
<td>2</td>
<td>12.50%</td>
</tr>
<tr>
<td>Dermoid cyst</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Adenocarcinoma of minor salivary gland</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Optic nerve glioma</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Chronic granulomatous inflammation</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Intracanal abscess</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Ectopic salivary gland</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Shwanoma</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Meningioma</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>Pseudotumour</td>
<td>1</td>
<td>6.25%</td>
</tr>
</tbody>
</table>

Fig. No. 1: 4 years old girl having restricted movement in right eye

Fig No. 2: Post-operative CT Scan & MRI after surgery of 17 old boy
DISCUSSION

This study was carried out to report the complications of lateral orbitotomy. In this study 16 patients were operated through lateral orbitotomy via lateral canthotomy incision in 13 patients and S shaped incision in 3 patients; the latter is reported as producing ugly scar15, but in this study, little or no scarring of skin was observed in these 3 patients. Bone was removed in all 16 patients with no complication. Intraoperative haemorrhage was encountered in one patient who was 50 years old female with intraconal haemangioma. The haemorrhage was successfully managed by identifying and ligation of the bleeder vessel while using suction packs to clear the view of operating area. The same procedure was observed in these 3 patients. Bone was removed in all 16 patients with no complication. Intraoperative haemorrhage was encountered in one patient who was 50 years old female with intraconal haemangioma. The haemorrhage was successfully managed by identifying and ligation of the bleeder vessel while using suction packs to clear the view of operating area. The same procedure is reported by Jack Rootman.16 In this patient lateral rectus fibrosis was observed at 03 months follow up that was confirmed by forced duction test.

The lateral rectus muscle damage was encountered in 2 patients while separating it from the lesion, one patient was 13 years old male having malignant biphasic tumour of lacrimal gland that was adherent to lateral rectus muscle; the muscle was primarily repaired with 6/0 vicryl. Post-operatively, patient developed transient impairment of abduction. Later on patient gained good muscular function. The other patient was 4 year old girl having chronic granulomatous inflammatory mass that was adherent to muscle; and muscle belly was damaged while separating the mass, that was primarily repaired. She had transient impairment of abduction, recovered at 4th month of follow up.

A 4 year girl having axial proptosis due to pseudo tumour underwent uneventful lateral orbitotomy, intraconal mass was removed. After 4 weeks she developed restrictive extraocular movements in all gazes.(Fig-1) She had no but little movements of eyeball with good pupillary reaction probably due to post-operative fibrosis. A 17-year old male patient underwent lateral orbitotomy, but the surgeon failed to locate lesion at that time and the wound was closed. The patient was re-evaluated (Fig-2) and discussed with neurosurgeon for the location of lesion, and superior orbitotomy via sub-brow incision was carried out for excision of sub-periosteal ectopic salivary gland. In some cases neurosurgical opinion is necessary to avoid unwanted effect.

No patient suffered from visual loss after undergoing lateral orbitotomy, 5 patients got betterment in postoperative visual acuity from their pre-operative recorded visual acuity, the best was 40 year old female had intra-conal haemangioma with disc oedema and RAPD; she improved her vision from pre-operative recorded visual acuity counting finger at 1 ft to 6/6 BCVA.

This study is in accordance with the study carried out by Arai H, Sato K et al.17 They reported series of 26 patients all underwent lateral orbitotomy approach for intra-orbital lesion. Post-operative complications in their series of 26 patients included one case of postoperative visual impairment, one case of tonic pupil and three cases of transient impairment of eye movement. Over all complication rates in their series was 19.23% that is 5 out of 26 patient. In this study over all complication rate in patients who underwent lateral orbitotomy is 25%, that is 4 patients out of 16 patients had postoperative complications including, one case of restrictive eye movement in all gazes, External Ophthalmoplegia 2 cases of transient impairment of eye movements and one case of muscle fibrosis. No patient in this study had visual impairment or pupillary involvement postoperatively. Kaptanoglu E, Solaroglu I et al18 in their reported postoperative complication in three patients including transient impairment of eye movement in two cases and worsened visual impairment with atonic pupil in another case. In our study there were no visual loss in any patient or pupillary involvement postoperatively.

CONCLUSION

With appropriate planning and surgical technique, lateral orbital yields a high degree of success and few permanent complications. Visual function usually is improved, cosmetic appearance is enhanced, and life-threatening conditions can be eliminated.

REFERENCES

Complications of Lateral Orbitotomy


INTRODUCTION
Visually significant posterior capsular pacification (PCO) is a very common late complication of uneventful cataract surgery apart from causing decreased visual acuity, PCO may impair contrast sensitivity, cause difficulties with glare or give rise to monococular diplopia. The incidence of PCO has been reported to vary as occurring from 1-5 years post operatively after uneventful extra capsular cataract surgery in 25 percent of patients. PCO occurs mostly due to proliferation and migration of residual equatorial epithelial cells along the posterior capsule at the site of apposition between the remnants of the anterior capsule and the posterior capsule (Elsching pearls) or less common due to capsular fibrosis; fibrous metaplasia of epithelial cells. The understanding of pathogenesis has led to improvements of cataract surgical techniques, including intraocular lens (IOL) material and designs.


Mahmooda Soni Wali M.Sc, FCPS1, M. Arif Khan FCPS2, Zahid Jadoon M.Sc3

ABSTRACT
Cataract is one of the leading causes of curable blindness in the world. Extra capsular cataract extraction, phacoemulsification and manual small incision cataract surgery is a popular method for treatment of cataract with posterior chamber IOL. Posterior capsular opacification is a common late complication of cataract surgery as a result of proliferation of residual lens epithelial cells which causes fibrotic changes and wrinkling of the posterior capsule. PCO Usually develops within 2 years after cataract surgery causing decreased vision. Neodymium yttrium aluminum garnet (Nd:YAG) laser posterior capsulotomy is a safe technique, performed in the outpatient department, for making an opening in the opacified posterior capsules. Laser shots can be applied in several patterns such as “Cruciate or Cross pattern”, “Cane opener”, “U-Method” and in a “Circular pattern”. Like all procedures, Nd: Yag capsulotomy is also associated with certain complications.

Materials & Methods: A randomized clinical trial was done in the outpatient Eye Department of NBMH to assess the visual outcome and complications by comparing two techniques of Nd: YAG Laser Capsulotomy Cruciate pattern VS Circular Capsulotomy.

Results: In this study, 58 eyes of 58 patients were divided into two groups. In one group cruciate pattern of laser shots were given and in the 2nd group circular pattern of laser shots was used. Immediate visual outcome on 1st day was better with circular pattern. The incidence of IOP spike was less with circular pattern as compared to cruciate pattern. The IOL Lens pitting, CME and retinal detachment were not observed in patients who underwent circular pattern laser capsulotomies.

Conclusion: The circular pattern technique is safe and effective. Rapid visual recovery is achieved. Its use in routine management of PCO is suggested.

The circular pattern technique is safe and effective. Rapid visual recovery is achieved. Its use in routine management of PCO is suggested.

Although Nd: YAG Laser is a safe and non invasive outpatient procedure however like all procedures it is associated with some complications, such as intraocular lens pitting / laser marks, transient rise in intraocular pressure, uveitis, hyphema, subluxation of the IOL,
cystoid macular oedema (CME) and retinal detachment. Laser shots can be applied in several patterns. One of the frequently used techniques is cruciate or cross pattern method, another conventional method is the cane opener method along the circumference of the optic, an inverted ‘U’ Method, and a recently introduce Circular method.\textsuperscript{14,15,16,17}

In this prospective randomized clinical trial, a comparison is made between two methods of Nd: YAG Laser Capsulotomies. The conventional cruciate pattern and circular pattern of Nd; YAG Laser capsulotomies and their visual outcome and complication rates.

**MATERIAL & METHODS**

This randomized clinical trial was conducted in the Eye OPD of Govt. Naseerullah Baber Memorial Hospital, Peshawar from May 2014 to May 2015. We included 58 patients with significant posterior capsular opacification after uneventful small incision cataract surgery presenting between 2-5 years post operatively, after informed consent.

**Inclusion Criteria:**

- All patients with significant posterior capsule opacification (PCO) causing reduced vision and interfering with daily activities.
- Post operative duration of > 6 months.
- Difficulty in visualization of the fundus
- Age >15 years.
- Both genders

**Exclusion Criteria:**

- Corneal scarring or oedema that prevents a clear view during the procedure.
- Presence of uveitis, high myopia, very thick PCO
- Cystoid macular oedema. (CME)
- Patients with a history of retinal detachment
- Patients in the immediate post operative period because the intraocular lens may not be adequately scarred into place.
- Patients with glaucoma, who may have an intraocular pressure spike from the inflammation or post operative steroid response.

Written consent was taken from all the patients. A thorough history and complete ocular examination was performed which included assessment of visual acuity using Snellen’s vision chart, slit lamp biomicroscopy, air-puff tonometry, and dilated fundus examination with 78 D lens. Nd: YAG laser capsulotomy was performed using two techniques.

1. Cruciate pattern and
2. Circular pattern to create an opening of 4mm.

In the posterior capsule the amount of energy and number of pulses were adjusted as required. Comparison of visual outcome and complications with the two techniques was made and analyzed using SPSS version 16. After laser all patients were examined for IOP spike after 1 hr – 3 hrs and topical beta blockers were started in eyes with raised IOP. Fluromethalone eye drops were given (4 times / day for 1 week) to all patients. Patients were requested to come for follow up after 1 week and 4 weeks. Detailed eye examination was performed at each visit including visual acuity with Snellen’s chart, measurement of IOP, (with air puff tonometer), slit lamp bimicroscopy was done, status of IOL Checked, and a dilated fundus examination was done. Any complications during this period were documented and treated accordingly.

**Data Analysis:** The data was analyzed by using software SPSS version 16. Mean and standard deviation was compared for quantitative variables. Frequency and percentage was computed for gender. Descriptive statistics was used to generate $p$-value for visual acuity before and after Nd: YAG Laser Capsulotomy and a comparison of complications rate was made with cruciate and circular pattern, \( p \) value < 0.05 was considered as significant.

**RESULTS**

A total of 58 patients were included in this study form May 2014 to May 2015 including both genders with ages ranging from 55 years to 70 years, refer table 1 and 2. Nd: YAG laser was performed in 36 (60%) right eyes and 23 (40%) left eyes refer table 3. Visual acuity was recorded before performing Nd: YAG laser refer table 4 Nd: YAG Laser capsulotomies were performed using cruciate pattern of laser shots in 29 patients and circular pattern in the 29 patients in one eye each (Right or Left). Mean energy used was 4mj (Range 1-5 to 8.0 mj/Pulse). No of shots varied from 6 to 19 with a mean of 10.7.

A comparison of visual outcome and complications was made with the two patterns of laser shots. Refer to table. 5 and 6. Visual outcome was better and incidence of complications was comparatively less with circular tech.

### Table 1: Frequency Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32</td>
<td>55.2</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>44.8</td>
</tr>
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<td>Total</td>
<td>58</td>
<td>100.0</td>
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### Table 2: Frequency EYE

<table>
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<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Right Eye</td>
<td>30</td>
<td>51.7</td>
</tr>
<tr>
<td>Left Eye</td>
<td>28</td>
<td>48.3</td>
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<tr>
<td>Total</td>
<td>58</td>
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Table 3: Descriptive Statistics AGE

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>58</td>
<td>55</td>
<td>70</td>
<td>62.3</td>
<td>4.823</td>
</tr>
</tbody>
</table>

Table 4: Frequency VA Before YAG

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/60-Cf</td>
<td>17</td>
<td>29.3</td>
</tr>
<tr>
<td>6/24-6/36</td>
<td>20</td>
<td>34.5</td>
</tr>
<tr>
<td>6/36/6/18</td>
<td>21</td>
<td>36.2</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5: VA After YAG Pattern of YAG Cross Tabulation

<table>
<thead>
<tr>
<th>Pattern of YAG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cruciate</td>
</tr>
<tr>
<td>VA After YAG 6/24 = 6/36</td>
<td>n</td>
</tr>
<tr>
<td>8</td>
<td>27.6</td>
</tr>
<tr>
<td>Better than 6/18</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
</tr>
</tbody>
</table>

P value (.002) is Significant

Table 6: Complication of YAG Pattern of YAG Cross Tabulation

<table>
<thead>
<tr>
<th>Complications</th>
<th>Cruciate</th>
<th>Circular</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOL Pitting</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>10</td>
<td>17.24</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>IOP Spike</td>
<td>14</td>
<td>24.13</td>
<td>12</td>
</tr>
<tr>
<td>Iritis</td>
<td>-</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Floaters</td>
<td>2</td>
<td>3.4</td>
<td>-</td>
</tr>
<tr>
<td>CME</td>
<td>3</td>
<td>5.17</td>
<td>-</td>
</tr>
<tr>
<td>None</td>
<td>-</td>
<td>16</td>
<td>27.58</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>49.94</td>
<td>29</td>
</tr>
</tbody>
</table>

P value is .037 which is significant

DISCUSSION

Visually significant posterior capsular opacification (PCO) is a very common late complication of uneventful cataract surgery.\(^1\) PCO results in decreased visual acuity, glare decreased contrast sensitivity and monocular diplopia.\(^2\) This can usually be remedied by laser procedure with Nd: YAG capsulotomy, however this procedure is associated with complications such as damage to the intraocular lens increase in post-laser IOP, CME, disruption of anterior vitreous face and increased incidence of rational detachment and propioni-bacterium acne endophthalmitis.\(^9,10,11,12,13,14\) A comparison of visual outcomes and complications using two techniques of laser pattern, cruciate versus circular was made.

The patient’s pupil was dilated, showing the optic margin by instilling several drops of tropicamide 0.5% 30 minutes prior to the procedure. A capsulotomy contact lens which was a 12mm ocular Abraham capsulotomy lens (Ocular Instruments, WA, US) was used in all cases, after instilling 2-3 drops of 0.5% Proparacaine hydrchloride into the conjunctival sac and 2% hyproemollose gel into the contact lens as a coupling media. The optic center was set as a point corresponding to the visual axis.

For the circular pattern laser shots, minimal amount of laser energy was used 1.5 mj/pulse a number of laser shots in the posterior capsule aimed at posterior 150nm from a datum point were conducted along an imaginary line which extended 0.5mm inside the optic margin or along anterior continuous curvilinear capsulorhexis (CCC) and into circular en-bloc pattern. After circular applications of laser, vitreous strands which were attached with the fragment were cut with the laser. The problem of flouters is also avoided as cutting of vitreous strands can be easily performed during laser capsulotomy and than this fragment is quickly sun in intra-vitreal space, At the end of the procedure\(^17\) as compared to cruciate laser pattern in which sometimes a flap of the posteriors capsule may extend into the pupillary space and cause problems.\(^15,16\) The circular pattern laser shots avoid the visual axis which resulted in decreased frequency of IOL Pitting which although an innocuous complication can cause glare and light scattering and be visually disabling. Thus the circular technique can prevent any damage near the visual axis of IOL and generate sufficiently large size of the capsulotomy to restore contrast sensitivity and overcome glare disability.\(^17\) It is presumed that dissection of vitreous strands which is attached to posterior capsule would prevent any additional problems such as CME and retinal detachment due to vitreous traction, compared with the conventional cruciate pattern.

In cruciate pattern posterior capsulotomy laser shot is first aimed superiorly at near 12 Clock in the location of fine tension lines and progressing downwards towards the 6 o’ clock position, shots are then placed at the edge of the capsule opening, progressing laterally towards the 3 and 9 o’ clock positions.\(^16\) The procedure was performed in patients with minimum of one year after cataract surgery. In patients who underwent circular pattern capsulotomy there was an immediate improvement of VA compared to these who underwent conventional cruciate method. This reflected in the record of VA after one week post

laser. Refer Table 6. Patients were followed up for 1 week and 4th week with VA, slit lamp biomicroscopy, a dilated fundus examination was performed to check for any retinal complication like CME and or retinal detachment. CME was seen in three patients who had cruciate pattern laser capsulotomy confirmed on macular OCT 6 months after the procedure. It resolved with treatment with topical non-steroidal anti-inflammatory eye drops over 1 to 8 months. More serious consequences like endophthalmitis and retinal detachment, were not seen in this study. Given an adequate capsulotomy size, minimizing of lens pitting and an accurate refraction visual outcomes for laser are excellent in the absence of a co-morbid condition.

CONCLUSION

In conclusion, this new technique of circular pattern Nd: YAG posterior laser capsulotomy can be performed safely and achieves rapid visual recovery its use in routine management of PCO is suggested.

REFERENCES

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder, its prevalence is rising in Pakistan and all over the world, affecting 240 million people worldwide. The number may become 380 million by 2025, with 80% of burden in low and middle income countries. Pakistan is 7th largest country in terms of Diabetic population and it will be 4th largest by the year 2030. Which is an alarming figure. DM is rising because of increasing obesity and unhealthy life styles. The disease is also a leading cause of heart disease renal failure, blindness, non-traumatic lower limb amputation. Diabetes mellitus is preventable disease; health education and public awareness becomes critically important. Physicians, medical students and health care workers constitute important diabetes health education provider to the patient and public. Management of diabetes and associated complications pose great challenges for health care workers. The burden of disease is huge in the world and extraordinary efforts are required from all the health care workers to prevent the morbidity and mortality associated with the disease.

The knowledge of DM and its risk factors are essential for primary healthcare personnel, to avoid co-morbidities. 60% of the undergraduate medical students have adequate knowledge of the disease, lack of basic knowledge could have dangerous consequences for the patient. Hence, the curriculum should include the basic knowledge of DM with its management.

ABSTRACT

Background: Assessment of the knowledge of patho-physiology, diagnosis, treatment and care of the patients with diabetes mellitus among medical students in preclinical years is important since majority of patient admitted to hospital have underlying diabetes which could lead to adverse clinical outcome if not managed efficiently.

Objective: Purpose of study was to evaluate knowledge related to etiology risk factors, diagnosis and management of different complications of diabetes among medical and dental student at IMDC where an integrated hybrid PBL curriculum is running as pretest before introduction of biochemistry of diabetes mellitus endocrinology module.

Methods: A validated self administered questionnaire was used related to diabetes awareness was used.

Result: In this study 73 second year 51 female and 22 male and 29 BDS students comprising of 22 female and 2 male students. Majority of students (n=56 /102) obtained average (between 14-19/24) diabetic knowledge score, (n=31/102) got poor score (less than 14/24) and only few of them got good score 14/102 students they belong to MBBS.

Conclusion: As there is no prior studies in our setting, evaluating knowledge related to diabetes mellitus diagnosis and management among medical students. This study has importance, based on these results, foundation of knowledge can be filled through medical and clinical education to improve future delivery of diabetic care.

Keywords: Diabetes mellitus, Knowledge, Lifestyle, Young adult.
diabetes is found among healthcare workers. Health care professionals and medical students have a very important role in increasing awareness of the disease, disease prevention and health promotion. Various studies conducted among medical students unfortunately showed an inadequate knowledge about diabetes. Local studies among physicians and nurses also revealed inadequate knowledge and skills for education and treatment of diabetic patients. No studies regarding knowledge of medical students about diabetes has been conducted in Pakistan.

Education and awareness about diabetes is important as it correlates with better outcomes of disease management. We know that the medical students are future of caregivers to the patients with the disease and their knowledge and awareness about the disease play a role in dissemination of information about diabetics, the studies about the attitudes of diabetes among students are limited in our country and none in our setup so this study was undertaken to fulfill the gap. For this purpose this study was designed to find out the awareness of medical and dental students about the disease.

METHODOLOGY

This was a cross sectional study carried out at Islamabad Medical and Dental College, the duration of study was from January ’2013 to February’ 2014. A structured revalidated self administered questionnaire was distributed to students in lecture hall after taking verbal informed consent. Students were explained the nature and purpose of study. The questionnaire used obtained through net star county questionnaire consisting of 24 questions. The students were explained the nature and purpose of study and it was a part of pretest on diabetes mellitus course. There were 24 s and 78 females. This study was conducted to assess knowledge among medical students of IMDC regarding diabetes mellitus. Data was analyzed by inferential statistics using SPSS version 16 and descriptive statistics were used including frequencies and cross tabulation of knowledge score with the gender and class.

RESULT

<table>
<thead>
<tr>
<th>S. No</th>
<th>Diabetes knowledge questions</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eating too much sugar and sweet is cause of diabetes</td>
<td>73 (67%)</td>
<td>26 (23%)*</td>
<td>4 (3 %)</td>
</tr>
<tr>
<td>2</td>
<td>The usual cause of diabetes is lack of effective insulin in the body</td>
<td>96 (87%)*</td>
<td>6 (5%)</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>The diabetes is caused by failure of kidneys to keep sugar out of urine</td>
<td>47 (42%)</td>
<td>36 (33 %)*</td>
<td>20 (18%)</td>
</tr>
</tbody>
</table>
| 4     | Kidneys produce insulin | 8 (7%) | 87 (79%)* | 8 (7%)
| 5     | If untreated the amount of sugar in the body usually increases | 92 (84%)* | 7 (6%) | 4 (3%)
| 6     | If I am diabetic my children have chance of being diabetic | 79 (71%)* | 7 (8%) | 16 (14%)
| 7     | Diabetes can be cured | 56 (51%) | 41 (37%)* | 6 (5%)
| 8     | A fasting blood sugar level of 210 is too high | 88 (79%)* | 9 (8%) | 6 (5%)
| 9     | The best way to check my diabetes is testing my urine | 63 (57%) | 25 (23%)* | 15 (13%)
| 10    | Regular exercise will increase the need for the insulin or other diabetic medications | 26 (23%) | 62 (56%)* | 15 (14%)
| 11    | There are two main types of diabetes Type 1 (NIDDM) and Type 2 (NIDDM) | 99 (89%)* | 1 (.9%) | 3 (3 %)
| 12    | An insulin reaction is caused by too much food | 21 (19%) | 41 (37%)* | 41 (37%)
| 13    | Medication is more important than diet and exercise to control diabetes | 17 (15.% | 78 (71%)* | 8 (7%)
| 14    | Diabetes causes poor circulation | 46 (41%)* | 18 (16%) | 39 (35%)
| 15    | Cuts and abrasions on diabetes heal slowly | 96 (87%)* | 4 (3.6% | 3 (2.7%)
| 16    | Diabetics should take extra care when cutting toe nail | 86 (78%)* | 7 (6%) | 10 (9%)
| 17    | A person with diabetes should clean a cut with iodine and alcohol | 65 (59%) | 8 (7.2%)* | 30 (27%)
| 18    | The way I prepare food is more important than food I take | 78 (71%)* | 12 (11%) | 13 (12%)
| 19    | Diabetes can damage my kidneys | 80 (72%)* | 14 (13% ) | 9 (8%)
| 20    | Diabetes can cause loss of feeling | 72 (65%)* | 14 (13% ) | 17 (16%)
| 21    | Shaking and sweating are the signs of high blood sugar | 54 (47%) | 28 (25%)* | 21 (19%)
| 22    | Frequent urination and thirst are signs of low blood sugar | 42 (37%) | 45 (41%)* | 16 (15%)
| 23    | Tight elastic hose are not bad for diabetics | 20 (18%) | 48 (43%)* | 35 (32%)
| 24    | A diabetic diet consist mostly of special food. | 69 (62%) | 18 (16%)* | 15 (14%)

---

Table 1: Diabetic knowledge questionnaire (represent correct responses)
Table 2: Diabetes knowledge score

<table>
<thead>
<tr>
<th>Diabetes Knowledge Score</th>
<th>First Year BDS</th>
<th>Second Year MBBS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good score (19-24)</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Average score (14-19)</td>
<td>9</td>
<td>47</td>
<td>56</td>
</tr>
<tr>
<td>Poor score (less than 14)</td>
<td>19</td>
<td>12</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 3: Class * Sex * Diabetes Knowledge Score Cross tabulation

<table>
<thead>
<tr>
<th>Diabetes Knowledge Score</th>
<th>Sex</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Good score</td>
<td>Second Year MBBS (IMDC)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>9</td>
</tr>
<tr>
<td>Average Score</td>
<td>Second Year MBBS (IMDC)</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>First Year BDS (IMDC)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
</tr>
<tr>
<td>Poor Score</td>
<td>Second Year MBBS (IMDC)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>First Year BDS (IMDC)</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>27</td>
</tr>
</tbody>
</table>

Table 4: Group Statistics

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct Answer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Year MBBS (IMDC)</td>
<td>73</td>
<td>15.7123</td>
<td>2.86976</td>
<td>.33588</td>
</tr>
<tr>
<td>First Year BDS (IMDC)</td>
<td>29</td>
<td>12.3793</td>
<td>3.38499</td>
<td>.62858</td>
</tr>
<tr>
<td>Incorrect Answer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Year MBBS (IMDC)</td>
<td>73</td>
<td>8.2740</td>
<td>2.85900</td>
<td>.33462</td>
</tr>
<tr>
<td>First Year BDS (IMDC)</td>
<td>29</td>
<td>11.6207</td>
<td>3.38499</td>
<td>.62858</td>
</tr>
</tbody>
</table>

From above table 1 and 2 it is shown that percentages of correct answers of the students regarding causes (84%, 87%, 79%), pathology (72%), types (89%, 37%, 71%) presentation and complication (41%, 87%, 78%, 71%, 72%) and 65% and in few questions regarding complication were 25%, 41%, 43% and 16%). This showed lack of students awareness about diagnosis of hypo and hyper glycemia, each correct answer was given one mark and total 24 marks was given to full questionnaire.

Majority of dental as well as medical students have average score (n= 56/102), n=14/102 of medical have good score while none of dental had good score, poor score was obtained by 19 dental students and 12 medical students. The mean SD 15.71+_2.86 of medical students while dental students 12.37+_3.86, the mean SD was 8.27+_2.85 of medical students and those of dental was 11.62+_3.38.

**DISCUSSION**

This study aimed to assess knowledge of medical students about diabetes mellitus. The overall knowledge of medical students found in the study was average, while the second year medical students had better knowledge as compared to the first year dental students as shown in table 3 and 4. Similar results were observed among nurses, although some parameters were different, related to knowledge about diabetes. Majority of the students (87%) were aware that insulin is not produced by kidneys but they knew the types of diabetes mellitus and its diagnosis. Various presenting
symptoms of diabetes mellitus were also inquired from the students. More than half of the students in this study had an opinion that delayed wound healing is one of the symptoms of diabetes as has already been mentioned in another study.15

Prevention is always better than cure and the benefits of exercise in diabetes are substantial as is proved by the studies emphasizing the importance of exercise for the prevention of this commonest problem.16 Fortunately students of this study (78%) showed sufficient awareness about the importance of diabetes prevention and knew that exercise could help in prevention; 66% correctly answered about the role of physical activity and will not increase the need for insulin and other diabetic medications.17 On the other hand, a study done in America showed that only 31% of non diabetics were provided awareness by health care professionals about the role of exercise in prevention, suggesting an ignorance about the key role of exercise to prevent the disease.18 With the background knowledge of risk factors and importance of prevention, early detection through screening can help to alter the course of diabetes.19 This study showed 96% students had knowledge about cause of diabetes is lack of insulin.20

These findings suggest that continuous medical education sessions are now essential to keep students and physicians up-dated. Students’ knowledge about complications showed better standard among medical as compared to the dental students; because of problem based learning and case based learning of metabolic disorders where as dental students are not taught the detailed metabolic pathways. This is comparable with another study showing frequency of identifying different complications of diabetes among health care professionals.21 It was noted that only one-third of them including house officers, were able to identify different complications, suggesting that there is lack of understanding of the disease among the young graduates that require continuity of education and training.22 Majority of our students (80%) were aware that diabetes can damage kidneys and there is loss of sensation due to effect of diabetes on nerves, which may lead to delayed wound healing and sensation, leading to development of diabetic foot.23

The knowledge of students about diabetes was more in the medical students as compared to the dental students, whereas, overall knowledge of the students was average. Medical students being the future physicians will be the first line of defense in dealing with common medical problems including diabetes. These students are an important cadre of health professionals, therefore, the medical curriculum should lay emphasis on patient-based clinically oriented approaches and teaching.24 This could improve the standard of diabetes education among medical and dental students. Before developing a teaching material for educational activities for health professionals, a comprehensive assessment of health professional’s current knowledge must be done. The present study has shown whether our students will be able to manage patients with diabetes. Identification of the gaps in the knowledge would help us in highlighting these areas more specifically in future educational programs with an ultimate aim of improving diabetes care delivery in Pakistan.25

According to this current study, the overall mean score of the dental students was found to be quite low which points towards the inadequacy of diabetes training. The results were even lower to the study, from which the tool was acquired (61%)22 and other study done in UK.24 In contrast, the results were better than one of the recent study done in Switzerland21 but the difference could be attributed to the use of a slightly advanced questionnaire. The results were also low in comparison to the previous study investigating the diabetes related knowledge among family physicians in Pakistan (62%).16 These results are distressingly low keeping in view the exceedingly high number of diabetics in our country. Since the burden of non-communicable diseases like diabetes not only depends on preventive measures but also on the optimal care provided to existing cases.

The divergence in knowledge of diabetes mellitus between the participating students can be due to the difference in the content of the module as well as teaching styles (didactic vs problem based learning). The current curricula of the dental students focus mainly on individual patient and disease management, aiming at preventing disease deterioration of the condition. Due to the rapid increase of diabetes mellitus cases globally, it will be impossible to manage all those affected with diabetes mellitus individually.

**Limitations and recommendations of the study:**

The findings are relevant to students of a private medical and dental college only and cannot be generalized to students of other Pakistani universities. It may represent a sample of the health sciences university students. A cross-sectional study design. Health professionals’ knowledge, abilities and strategies can positively influence behavioral change in individuals with diabetes so as to adhere to diet, physical activities, monitoring blood glucose and taking oral medication and insulin, which enable adequate metabolic control.45 Adherence to these measures reduces devastating
complications and the need for hospitalization.\textsuperscript{6}

The need to develop teaching activities in health, that is focused on people with diabetes and their families, so as to adequate knowledge in relation to the disease, relating to the prevention of complications through management of the disease, leading to live better with their condition.\textsuperscript{5,5,8}

Effective education of people with diabetes mellitus about self-care requires health professionals to have knowledge of psychosocial, epidemiological and physio-pathological aspects of the disease in addition to pedagogical abilities, capacity to communicate, listen, understand and also to negotiate with the multi-professional health team.

\section*{CONCLUSION}

Knowledge of diabetes mellitus and its risk factors are essential for primary healthcare in order to prevent co-morbidities that can increase the burden of the disease. Although the results of the study revealed that almost 60\% of the undergraduate medical and dental students have adequate knowledge of Diabetes Mellitus, some areas are still lacking. The lack of basic knowledge could influence the effectiveness of patient education and therefore have dangerous consequences for the patient. The preclinical and especially dental curricula should include a sound knowledge based on about diabetes mellitus and its management, as well as population-based health promotion programs for patients with diabetes (prevention of possible complications) and health promotion activities to raise awareness among healthy people (prevention of the disease).

\textbf{Acknowledgement}: Special thanks to great teacher and mentor Professor Yasir Durrani for critical review of article . I would like to thank my students who participated in the study. I would like to thank Dr Muhammad Usman for helping in revision of the manuscript. Maryam Hafeez 4th year BDS students for the assembly and compiling of the data and all other colleagues who helped in computing the article .

\section*{REFERENCES}


26. Talat N, Nabeel A, Naueen A. Is there need of specialized
Lahore is the home of sports in Pakistan, Lahore's elites are fond of golf and city is home to several golf courses. The Lahore Gymkhana Golf Course, established in 1921, in the field of engineering and technology. The University of Veterinary and Animal Sciences. The De'Montmorency College of Government Islamia College Lahore, established in 1892, University of the Punjab, established in 1882, Kinnaird College, established in 1913, Lahore Government College Lahore (now University) was established in 1864, Forman Christian College, a chartered university established in 1864, for advanced learning.

Lahore is known as Pakistan's educational capital, with largest producer of professionals in the fields of science, technology, IT, engineering, medicine, gardens. established in 1862. In December 2004, Pakistan and China built Sukh Chayn Gardens, a beautiful housing society full of lush green parks and Lahore is known as the City of Gardens. The Shalimar Gardens was built during the reign of Shah Jahan in 1666. The Lawrence Gardens were known churches include Regal Church, Hall Road Church, Convent of Jesus and Mary and Sacred Heart Cathedral. Amongst festivals of Lahore, of Muhammad Iqbal, Bibi Pak Daman, Samadhi of Ranjit Singh, Tomb of Shah Jamal, Tomb of Lal Hussain and Tomb of Anārkalī, Some of the well-known mosques include: Badshahi Mosque, Data Durbar Complex, Suneri Mosque, Wazir Khan Mosque, Moti Masjid, Masjid-e-Shuhda (Martyr's Mosque) and Mosque of Mariyam Zamani Begum. Some of the famous shrines include: Tomb of Raja Bismillah, Tomb of Baba Mir Afzal, Tomb of Sheikh Nazrul Islam, Tomb of Sheikh Mian Ali, and Tomb of Sheikh ALL. Lahore is known as Pakistan's educational capital, with largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology, microelectronics, and nanotechnology. Following are the world-renowned centres for advanced learning.

Government College Lahore (now University) was established in 1864, Forman Christian College, a chartered university established in 1864, Government Islamia College Lahore, established in 1892, University of Punjab, established in 1882, Kinnaird College, established in 1913, Lahore College for Women University, established in 1922, Queen Mary College, Lahore, established in 1908 and University of Engineering and Technology, established in 1921, in the field of engineering and technology. The University of Veterinary and Animal Sciences. The De'Montmorency College of Dentistry. Pakistan Institute of Fashion and Design & the Lahore School of Fashion Design.

Lahore is the home of sports in Pakistan, Lahore's elites are fond of golf and city is home to several golf courses. The Lahore Gymkhana Golf Course, the Lahore Garrison Golf and Country Club, the Royal Palm Golf Club and newly built DHA Golf Club are well maintained Golf Courses in Lahore.
INTRODUCTION

Branch retinal vein occlusion (BRVO) is a common retinal vascular disease. It follows diabetic retinopathy in overall incidence of retinal vascular diseases. The risk factors that lead to BRVO include old age, hypertension, diabetes mellitus, atherosclerotic retinal vascular change, open angle glaucoma, and hypermetropia. BRVO may lead to vision threatening complications, such as Macular edema, Epiretinal membrane formation, Vitreous hemorrhage and Tretinal detachment. Macular edema (ME) is the most common cause of decreased visual acuity in BRVO. The gold standard for the treatment of ME in BRVO is the Macular grid laser. The Branch Vein Occlusion Study has shown a significant visual benefit only in persons with visual acuity of 20/40 or less. Several studies have shown good results with intravitreal triamcinolone injection (IVTA) in reducing ME and improving vision in patients with BRVO, but its use has been limited due to side effects, such as cataract formation and increased intraocular pressure. Intravitreal bevacizumab is an effective agent for the treatment of BRVO. It reduces ME, resulting in improvement in visual acuity.

Keywords: Branch retinal vein occlusion, bevacizumab, macular edema.

ABSTRACT

Purpose: To determine the anatomical and visual outcomes after intravitreal bevacizumab (IVB) injection on macular edema (ME) secondary to branch retinal vein occlusion (BRVO).

Study Design: Prospective, interventional case series.

Patients & Methods: This study was conducted from January 2015 to September 2015 at Al-Ibrahim Eye Hospital, Karachi. Selected patients having ME secondary to BRVO were given IVB 1.25mg at monthly intervals until the ME subsided. The patients were followed up for a minimum of 3 months. Complete ophthalmic examination and measurement of central macular thickness (CMT) by optical coherence tomography (OCT) were performed at baseline and follow-up visits.

Results: Forty-five eyes of 43 patients were included in the study. The mean CMT at baseline was 578.3 ± 156.1 μm, and it significantly improved at each follow-up, with a CMT of 281.2 ± 133.2 μm at the last follow-up (p < 0.001). The mean best-corrected visual acuity (BCVA) at baseline was 0.79 ± 0.49, and it significantly improved at each follow-up, with a BCVA of 0.42 ± 0.30 at the last follow–up (p < 0.001). The BCVA was improved in 38 (84%) eyes of the eyes. The average number of intravitreal bevacizumab injections was 3.8 (range= 2 - 7 injections). Recurrent ME occurred in 15 (33.3%) of eyes.

Conclusion: Intravitreal bevacizumab is an effective agent for the treatment of BRVO. It reduces ME, resulting in improvement in visual acuity.

Keywords: Branch retinal vein occlusion, bevacizumab, macular edema.
administration of bevacizumab is approved for the treatment of metastatic cancers. Intravitreal bevacizumab is being used for retinal vein occlusion\(^9\), age-related macular degeneration\(^8\) and proliferative diabetic retinopathy\(^10\) as an off-label treatment; its use has risen sharply, mainly because of its efficacy and lower cost. Its use for RVO was first reported by Rosenfeld in 2005.\(^11\) This prospective clinical study was designed to assess the efficacy of intravitreal bevacizumab in ME secondary to BRVO.

**PATIENTS & METHODS**

This study was conducted from January 2015 to September 2015 at Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Karachi. Forty three consecutive patients (45 eyes) having BRVO were given off-label IVB. **Inclusion criteria** were patients presenting with BRVO; having macular edema on florescein angiogram (FA); central macular thickness (CMT) > 300 μm on OCT; and visual acuity worse than 6/9. Patients excluded from the study were those with concomitant vision threatening diseases e.g. age-related macular degeneration, diabetic retinopathy, optic neuropathy, or ocular (iris or retinal) neovascularisation secondary to BRVO, history of treatment with laser therapy or intravitreal pharmacotherapy, pregnancy, patients with recent history of myocardial infarction, or cerebrovascular accident within three months of presentation. Informed and written consent was obtained from the patients, after fully explaining the possible risks and benefits of the off-label use of IVB. The study was approved by the institutional review board.

Patient evaluation included detailed ocular and systemic history, ocular examination, FA and OCT. Ocular examination at baseline and at every follow-up included best-corrected visual acuity (BCVA) on Snellen’s chart; anterior and posterior segment examinations using slit-lamp and 90 D lens, as well as an indirect ophthalmoscope and a 20 D lens and intraocular pressure (IOP) by Goldmann applanation tonometer. Fluorescein angiogram (FA) was performed at baseline to confirm the ME and to rule out macular ischemia and retinal neovascularisation. Central macular thickness was measured with optical coherence tomography (Stratus OCT; Carl Zeiss Meditec, Dublin, CA) at baseline and at every follow-up visit, at 4 weekly intervals, until the ME was resolved and then every 2 months until the end of study period. All patients were referred to internist for evaluation and management of systemic risk factors and to monitor the possible systemic side-effects of IVB.

The intravitreal bevacizumab was injected in a dose of 1.25 mg/0.05 mL in accordance with the standard protocol for an intravitreal injection at baseline and repeated at 4 weekly intervals, until the ME resolved. Patients who didn‘t respond to six consecutive monthly injections of IVB were labelled as “Resistant ME” cases, and were treated with grid laser +/- IVTA. Patients who responded well to IVB, with resolution of ME on OCT, were followed up at 2 monthly intervals, until the end of study period. If there was recurrence of ME on OCT at any follow-up, it was labelled as “Recurrent ME”, and retreatment with IVB was advised, along with grid laser treatment.

Main outcome measures were mean BCVA and mean CMT at the last follow-up visit. Visual acuity was converted to LogMAR for visual outcome analysis. The data was analyzed in SPSS software (version 11.5; SPSS Inc, Chicago, IL). Paired t-tests were used for statistical analysis. \(P\) values less than 0.05 were considered statistically significant for this study.

**RESULTS**

Forty five eyes of 43 patients were included in the study, out of which 62% were male patients. Forty one patients had unilateral involvement, while 2 patients had bilateral BRVO. The mean age was 56.72 years (11.0 SD), with a range of 36–85 years. The mean number of IVB injections was 3.8 (1 SD), with a range of 2–7 (Table 1). The mean BCVA at baseline was 0.79 ± 0.49. After IVB, the mean BCVA improved to 0.58 ± 0.35 at 4 weeks, 0.49 ± 0.21 at 8 weeks, 0.44 ± 0.12 at 12 weeks and 0.42 ± 0.30 at the last follow-up visit. The improvement in BCVA was statistically significant at each follow-up (\(P < 0.001\)) compared to baseline values (Table - II). BCVA improved in 38 (84%) eyes of the eyes, remained the same in 6 (14%) of the eyes, and deteriorated in 1 (2%) eye at the last follow-up.

The mean CMT at baseline was 578.3 ± 156.1 μm. The mean CMT improved to 440.4 ± 165.3 μm at 4 weeks, 355.8 ± 163.9 μm at 8 weeks, 314.3 ± 256.3 μm at 3 months and 281.2 ± 133.2 μm at the last follow-up visit. A statistically significant reduction in CMT was observed at each follow-up visit (\(P < 0.001\)) relative to baseline values (Table - III). Out of the 45 eyes, CMT decreased in 41 (91%) of eyes; the remaining 4 (9%) eyes didn‘t show reduction in CMT and were treated as having “Resistant ME”.

After initial improvement in CMT and BCVA, there was recurrence of ME in 15 eyes (33.3%); these eyes were treated with IVB at 4 weekly intervals, along with grid laser treatment. There were no other major ocular or systemic problems in our patients till the last follow-up.
**Table 1:** Baseline characteristics of patients

<table>
<thead>
<tr>
<th>Gender n (%)</th>
<th>Male</th>
<th>26 (62%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>17 (38%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (years), Mean ±SD</th>
<th>56.72 ± 12.39</th>
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<tbody>
<tr>
<td>Range</td>
<td>36 – 85 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laterality</th>
<th>Unilateral</th>
<th>43</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Bilateral</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean no. of IVB injections</th>
<th>3.8 ± 1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>2 – 7 injections</td>
</tr>
</tbody>
</table>

| Mean follow-up period (months) | 4.5 ± 2.1 |

*Data shown in Mean ± SD and frequency (%)

* Abbreviation: IVB = Intravitreal Bevacizumab

**Table 2:** Comparison of mean BCVA b/w baseline and post IVB

<table>
<thead>
<tr>
<th>BCVA (logMAR)</th>
<th>Mean ±SD</th>
<th>Comparison</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (A)</td>
<td>0.79± 0.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 1st month (B)</td>
<td>0.58 ± 0.35</td>
<td>A vs B</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 2nd month (C)</td>
<td>0.49± 0.21</td>
<td>A vs C</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 3rd month (D)</td>
<td>0.44 ± 0.12</td>
<td>A vs D</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At last follow-up(E)</td>
<td>0.42 ± 0.30</td>
<td>A vs E</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Abbreviations: BCVA = Best corrected visual acuity IVB = Intravitreal Bevacizumab

**Table 3:** Comparison of mean CMT b/w baseline and post IVB

<table>
<thead>
<tr>
<th>Abbreviations: BCVA = Best corrected visual acuity IVB = Intravitreal Bevacizumab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Baseline (A)</td>
</tr>
<tr>
<td>At 1st month (B)</td>
</tr>
<tr>
<td>At 2nd month (C)</td>
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<tr>
<td>At 3rd month (D)</td>
</tr>
<tr>
<td>At last follow-up(E)</td>
</tr>
</tbody>
</table>

Abbreviations: CMT = Central macular thickness IVB = Intravitreal Bevacizumab

**Table 4:** Comparative analysis of IVB between the current and previous studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Current study</th>
<th>Demiret al13</th>
<th>Jaisle et al14</th>
<th>Yuko et al15</th>
<th>Kondo et al16</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Eyes</td>
<td>45</td>
<td>33</td>
<td>23</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>Baseline BCVA</td>
<td>0.79</td>
<td>0.66</td>
<td>0.50</td>
<td>0.55</td>
<td>0.53</td>
</tr>
<tr>
<td>BCVA at end of study</td>
<td>0.42</td>
<td>0.22</td>
<td>0.20</td>
<td>0.26</td>
<td>0.26</td>
</tr>
<tr>
<td>Base line CMT</td>
<td>578</td>
<td>494</td>
<td>395</td>
<td>514</td>
<td>523</td>
</tr>
<tr>
<td>CMT at end of study</td>
<td>281</td>
<td>262</td>
<td>255</td>
<td>293</td>
<td>305</td>
</tr>
</tbody>
</table>

Abbreviations: CMT = Central macular thickness, IVB = Intravitreal Bevacizumab BCVA = Best corrected visual acuity

**DISCUSSION**

Branch retinal vein occlusion is a common cause of visual morbidity in both the elderly and younger populations. Lately, there have been several well-designed, randomized controlled trials that have shown the efficacy and safety of pharmacotherapeutic agents, including IVB, in treating macular edema in BRVO. Studies conducted on IVB have provided the evidence base for the use of an off-label agent to treat this condition.

In our series of 45 BRVO eyes treated with intravitreal bevacizumab, macular edema and visual acuity significantly improved at the last follow-up. Comparative analysis with other studies is presented in table IV. The major difference in treatment protocol of IVB in BRVO, as compared to exudative AMD and diabetic ME, is that the 3 loading doses are not necessarily required in BRVO, a PRN approach can be followed from the start of treatment, and retreatment can be given according to the changes in CMT. We followed this PRN approach in our patients. Monthly doses of IVB were given till the ME was resolved and retreatment was based on OCT findings. This OCT guided treatment protocol helps reduce the total no. of injections that the patients receive. The MARVEL group published a study comparing bevacizumab with ranibizumab for BRVO; the result suggested a compatible benefit of either agent in treating BRVO using the “as required regime”, with an average of three to four injections needed in the first 6 months.

It has been observed by Krohne et al that elimination of bevacizumab from the aqueous humor closely parallels that from the vitreous; they concluded that the aqueous half-life of 1.5 mg of intravitreally injected bevacizumab in humans is 9.82 days. The half-life of bevacizumab is therefore short and retreatment is often required. The average number of intravitreal bevacizumab in our series was 3.8, ranging from two to seven injections.

Intravitreal bevacizumab is an effective pharmacotherapeutic agent drug for resolution of ME and improvement in visual acuity in BRVO. As compared to IVTA, it is much less likely to cause secondary glaucoma and cataractogenesis but the advantage of IVTA over IVB is its longer duration (3 months) of action and therefore less frequent injections. When compared to grid laser, IVB shows greater reduction in ME and improvement in visual acuity, while grid laser has limited potential for visual recovery. However, the main drawback of intravitreal bevacizumab is its short duration of action (4-6 weeks), frequent injections and follow-ups and recurrence of ME, once the treatment is...
8. Quam T, Xu Q, Joussen AM. VEGF initiated blood-retinal
9. Hou J, Tao Y, Jiang YR, Li XX, Gao L. Intravitreal bevacizumab
10. The Branch Vein Occlusion Study Group. Argon laser
11. CONCLUSION

The major limitations of our study are use of an
12. We did not observe any major ocular or systemic problems after intravitreal bevacizumab, such as endophthalmitis, cataract, glaucoma, retinal detachment, or thromboembolic events. It is known that 60% of patients with retinal vein occlusions have cardiovascular comorbidities. Given the 5%-10% risk of retinal vein occlusion developing in the second eye within a 2-3-year period and the possibility of thrombo-embolic accidents after IVB, it is essential that the patients should undergo cardiovascular screening and management.

The major limitations of our study are use of an
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39. The major limitations of our study are use of an
40. The major limitations of our study are use of an

CONCLUSION

Intravitreal bevacizumab is an effective agent for
41. REFERENCES

1. Klein R, Klein BE, Moss SE, Meuer SM. The epidemiology of
Orbital Complications of Acute Sinusitis

Tallat Najeeb FCPS¹, M. Zubair Khan FCPS², Sohail Sukhera FCPS³

ABSTRACT

Objective: To determine frequency of orbital complications in patients with acute sinusitis and to evaluate results after early surgical intervention.

Material & Method: This cross sectional descriptive study conducted at ENT and Eye departments of Social Security Hospital, Rawalpindi and Maroof International Hospital, Islamabad during period of 2009 to 2015. Sampling was done by non-probability convenient type. Study included all the patients presented with acute sinusitis and with its orbital complications. CT scan was advised in all patients with orbital complications. Immediate ophthalmic consultation was taken. Orbital complications were divided into pre-septal and post-septal by using Chandler’s classification. Conservative treatment was given in cases of preseptal and immediate surgery was planned in all patients with postseptal complications and in preseptal disease not responding to medical treatment.

Results: Out of 133 patients of acute sinusitis 24 patients presented with orbital complications. (class-I) Mean age was 26 years. 7 were female and 17 were male (66%) patients presented with preseptal and 8 (33%) with postseptal complication. 4 with subperiosteal abscess and 3 with orbital cellulitis and one with unilateral 6th nerve palsy. Preseptal disease improved with conservative treatment. External ethmoidectomy was done in 7 cases and Endoscopic sinus surgery (ESS) in one case with unilateral 6th nerve palsy, persisted after surgery. Vision was 6/6 in all except in 3 patients with orbital cellulitis. All the cases were discharged on 7th post-operative day after ophthalmology consultation. Frequency of orbital complications in acute sinusitis was 15.05%. Using Chi square test, results were significant as p value was < .05.

Conclusion: Ophthalmology consultation and CT scan should always be advised in patients with eyelid swelling to make early diagnosis. Antibiotic therapy, early surgical intervention is mandatory.

Key Words: Sinusitis orbital complications of sinusitis treatment.

INTRODUCTION

Infective bacterial sinusitis is inflammation of lining of mucosa of nose and sinuses with suppurating organisms. Sinusitis if not treated can lead to local or systemic complications. The majority of complications are associated with acute sinusitis when drainage of sinus is blocked by acute inflammation. In chronic disease there is sclerosis of adjacent bones hence local extension is rare. Local complications include orbital and intracranial complications (ICC). Orbital complications are more common than ICC, further there are more common in children because of thin bone. Orbital complications have been classified by Chandler et al (Table 1). Periorbital tissues are strong barriers to infection. Preseptal disease is merely edema of eyelids due to venous blockage without chemosis, proptosis, vision defect and restricted eye movements. All these indicate postseptal infection, require early surgical intervention under antibiotic cover. Conservative treatment with proper antibiotic cover is the mainstay of treatment. Orbital abscess (class-IV) and cavernous sinus thrombosis (class-V) are more severe and life threatening conditions, usually present with ophthalmoplegia, exophthalmos and loss of vision. Surgery with antibiotic cover is the treatment of choice in postseptal infections. These if not treated or if surgery is not done in time can lead to permanent loss of vision. Our purpose of study was to find out frequency of orbital complications in acute sinusitis after introduction of various broad-spectrum antibiotics and to analyze results of treatment.

Orbital complications of sinusitis are not much rare. Edema of the eyelids with sinusitis should be considered an alarming sign. Ophthalmology consultation and CT scan should always be advised to rule out more serious orbital complications and to make early diagnosis. Aggressive antibiotic therapy in preseptal disease, early surgical intervention in patients with postseptal diseases and not responding to conservative treatment to prevent morbidity and life threatening complications, it is mandatory.

MATERIAL & METHOD

This retrospective and prospective study included all the patients presented with acute sinusitis with or without complications during period of study. Patients
with orbital complications of acute sinusitis, diagnosed in ENT department or referred from ophthalmology department were also included in this study. Patients with acute sinusitis with other diseases such as diabetes, tuberculosis, history of sinus fracture, any sinus surgery, and tumors of sinuses and patients who refused for CT scan were excluded from study. Patients devoid of any record were also excluded from study.

Clinical features of acute sinusitis like nasal obstruction, pussy rhinorrhea, headache, pain on bending head, post nasal drip (PND), tenderness over sinuses, nasal congestion, pus in middle meatus, fever and haziness of sinuses on radiograph of paranasal sinuses (PNS) occipito-mental view has been the criteria for diagnosing acute sinusitis. CT scan was advised in all those patients with any type of orbital complications of acute sinusitis to confirm the type of ophthalmic complication. Immediate ophthalmic consultation was taken in these patients. Chandler’s classification was used to classify orbital complications of acute sinusitis. Ophthalmic complications were divided into preseptal and postseptal one. All the patients with orbital complications were admitted in ENT department, regular ophthalmology assessment was done. Conservative treatment was given in cases of preseptal ophthalmic complication in the form of intravenous antibiotic, nasal and oral decongestants. Immediate surgery was planned in patients with postseptal ophthalmic complications and in those cases of preseptal disease not responding to medical treatment. CT scan was only repeated in those cases where deterioration was observed in regular ophthalmic examination. Surgical procedures were External ethmoidectomy and endoscopic sinus surgery (ESS) in postseptal complications and antral lavage in preseptal complications. Frequency of orbital complications and outcome of treatment was evaluated. Statistical evaluation of results was done by using window SPSS 16 and descriptive analysis was done. Chi square test was applied on descriptive data. Results were considered if p value < .05.

RESULTS

133 patients with acute sinusitis full filling already set criteria for acute sinusitis were included in this study either presented as outpatient department or had been admitted in ENT department. Out of these 133, 24 patients presented with orbital complications. In all the cases disease was one sided involving unilateral orbit. These patients were further evaluated. Age range was between 7 years to 45 years, mean was 26 years. 16 (66.6%) were adults above 12 years and 8 (33.3%) were children below 12 years of age. 7 (29%) were female and 17 (70%) were male. 2 females and 6 males were below 12 years of age. 4 children presented with rhinitis and cellulitis of upper eye lid and preseptal disease. Post septal complication was considered in 4 children presented with upper and lower eyelid swelling not resolved by conservative treatment after 24 hours. CT scan showed subperiosteal abscess with eye ball displacement in 3 and orbital cellulitis in one case. There were mild restricted eye ball movements in 3 and ophthalmoplegia and blurring of vision in 1 case on ophthalmology examination. All the females from children group presented with preseptal cellulitis. Fever pussy rhinorrhea and nasal congestion were common clinical features. Only one male child also had acute suppurative otitis media (ASOM) with orbital cellulitis. All the children with preseptal cellulitis responded well to conservative treatment. External ethmoidectomy was done in all 4 cases of postseptal cellulitis. Subperiosteal abscess along with frontal and ethmoid sinuses were drained. 3 cases of subperiosteal abscess improved well after surgery, vision was 6/6. Patient of orbital cellulitis showed decrease visual acuity. All the cases were discharged on 7th post-operative day after ophthalmology consultation.

In adults 3 males and one female in adults presented with postseptal complications, CT scan showed subperiosteal abscess in one, orbital cellulitis in 2. One patient presented with acute sinusitis with unilateral 6th nerve palsy. CT scan showed sphenoiditis in this case. There was loss of visual acuity in both patients with orbital cellulitis. External fronto-ethmoidectomy with Lynch-Patterson technique was performed in three cases, one patient with orbital cellulitis developed loss of vision even after surgery, other one showed improvement in visual acuity. Endoscopic sinus surgery (ESS) was performed in case of sphenoiditis, unilateral 6th nerve palsy persisted after surgery. ESS was tried in one case of orbital cellulitis but showed deterioration in vision on ophthalmology consultation. External fronto-ethmoidectomy was performed and improved in it, 12 cases, 8 males and 4 females presented with swollen lower eyelids with no intra-orbital extension. 4 female and 6 male patients improved well after conservative treatment. 2 male patients required antral wash out of maxillary sinus along with it. Presenting complaints in these patients were severe headache and nasal obstruction. Frequency of orbital complications in acute sinusitis was found to be 15.05%. Postseptal complications were seen in 8 (33.3%) out of 24 cases. Preseptal complications were seen in 16 (66.6%) cases. Chi square test was applied; results were significant as p value was < .05.
Table 1: Chandler classification of Orbital Complications of Sinusitis

<table>
<thead>
<tr>
<th>Classes</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Inflamatory Edema and Preseptal Cellulites</td>
</tr>
<tr>
<td>Class 2</td>
<td>Orbital Cellulitis</td>
</tr>
<tr>
<td>Class 3</td>
<td>Subperiostal abscess</td>
</tr>
<tr>
<td>Class 4</td>
<td>Orbital abscess</td>
</tr>
<tr>
<td>Class 5</td>
<td>Cavernous sinus thrombosis</td>
</tr>
</tbody>
</table>

Table 2: Showing no of patients with Orbital Complications

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Sinusitis</td>
<td>103</td>
</tr>
<tr>
<td>Orbital complications</td>
<td>24</td>
</tr>
<tr>
<td>Preseptal complications</td>
<td>16</td>
</tr>
<tr>
<td>Postseptal Complications</td>
<td>8</td>
</tr>
<tr>
<td>Subperiostal Abscess</td>
<td>4</td>
</tr>
<tr>
<td>Orbital Cellulitis</td>
<td>3</td>
</tr>
<tr>
<td>6th Nerve Palsy</td>
<td>1</td>
</tr>
</tbody>
</table>

DISCUSSION

Complications of sinusitis have been reduced much due to early diagnosis and development of wide range of broad spectrum antibiotics. Public awareness for early seeking treatments even in lower socioeconomic has changed the outcome of surgical treatment with better prognosis. There is still a quite high incidence of orbital complications especially with acute one due to very close proximity of orbit with the sinuses and separation of ethmoid sinuses with very thin lamina papyracea. Early diagnosis of postseptal orbital complications is necessary to reduce the incidence of vision loss and intracranial complications, as palpebral vessels do not have any valves and drain to cavernous sinus.

In our study orbital complications are found to be more common in males and with ethmoiditis (70%). The same was also seen in previous studies. Predominantly orbital complications used to occur in young patients especially preseptal one. It also happened in our study, younger patients mean age 26 years dominated the series. In our series’ most of the patients 16 (66%) presented with preseptal disease and conservative treatment worked well in majority of cases 14 (87%). Only in 2 (13%) patients preseptal cellulitis did not resolve after 24 hours, surgical intervention was needed.

One finding was that, in all cases of our series disease remained unilateral with swelling of eyelids of one side. As none of our patient presented with cavernous sinus thrombosis that leads to bilateral eye involvement, it may be due better immune response of our patients, as majority of them were young and otherwise healthy.

CT scan remained the main diagnostic tool in our study as it has been in previous ones. Aggressive conservative treatment played a great role in treating preseptal disease especially in young patients. Ophthalmological consultation and imaging techniques has been the gold standard in our study to diagnose advancing infections.

Endoscopic sinus surgery (ESS) is not a new development but its role in orbital complication of sinusitis is disputable. We had been successful in removing the disease completely with ESS only in one case of sphenoid sinusitis. In two cases we tried ESS but later on we had to proceed to external ethmoidectomy as the patients showed deterioration of vision on ophthalmology consultation but it does not diminish its role. In fact more expertise are required in future to treat orbital complications with ESS. Same is the case in previous studies in which most of the orbital complications were treated by external approach. In one patient with 6th nerve palsy and sphenoiditis may be due to direct pressure over cavernous sinus, early surgical intervention and antibiotic therapy prevented the infection to spread the infection to sphenoid sinus. In our series’ most of the cases were of class I (%), 3 were from class II (orbital cellulitis %), 4 were from class III disease (preseptal abscess %). None of our patient presented with class IV or V. It might be due to early diagnosis, better antibiotic cover and early surgical intervention leading to early recovery and less morbidity. Preseptal edema should be alarming sign and aggressive antibiotic treatment should be given to control the disease at class I stage and to reduce life threatening conditions.

Hospital stay on average in our study had been 7 days due to prolong intravenous antibiotic therapy to reduce complications, in one previous study it had been 4.6 in preseptal and 7 days in postseptal orbital complications.

CONCLUSION

Orbital complications of sinusitis are not much rare. Edema of the eyelids with sinusitis should be considered an alarming sign. Ophthalmology consultation and CT scan should always be advised to rule out more serious orbital complications and to make early diagnosis. Aggressive antibiotic therapy in preseptal disease, early surgical intervention in patients with postseptal diseases and not responding to conservative treatment to prevent morbidity and life threatening complications, it is mandatory.
Orbital Complications of Acute Sinusitis

Table 3: Showing Management and Results of Treatment.

<table>
<thead>
<tr>
<th>Orbital complications</th>
<th>Treatment</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conservative</td>
<td>Antral Washout</td>
</tr>
<tr>
<td>Preseptal</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Postseptal</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

REFERENCES
Frequency & Causes of Conversion of Laparoscopic Cholecystectomy to Open Cholecystectomy

Musarrat Hussain FCPS (Gen. Surgery)1, Riaz Hussain MBBS2
Gul Sharif FCPS (Gen. Surgery)3, Muhammad Uzair FCPS (Paed. Surgery)4
Prof. Safir Ullah Khalil FRCS (Gen. Surgery)5

ABSTRACT
Objective: To determine the frequency and causes of conversion of laparoscopic cholecystectomy to open cholecystectomy.

Materials & Methods: This Descriptive cross sectional study was conducted at surgical D unit of Lady Reading Hospital, Peshawar from July 2014 to August 2015, on 145 patients with symptomatic gallstones disease. All patients were followed throughout the procedure to see any conversion and its causes. The demographic and clinical data of all the patients were collected using a specially designed proforma and data was analyzed with SPSS version-17.

Results: A total of 145 patients underwent laparoscopic cholecystectomy during the study period. The mean age was 40.65± 10.35 SD and age ranges from 20-68 years. The total number of cases converted to open cholecystectomy were 17 out of 145 patients. Thus frequency of conversion was 17 (11.7%) with commonest cause being adhesions 8 (5.5%) followed by hemorrhage 4 (2.76%). Moreover, conversions were more in male patients 30% as compared to 8.8% in females.

Conclusions: Laparoscopic cholecystectomy is the gold standard treatment modality in the management of symptomatic gallstones disease. One of its limitations is conversion to open procedure in difficult cases. But conversion should not be considered as complication of the procedure rather it is mature decision by the surgeons to avoid unnecessary lengthening the duration of surgery once they encounter any difficulty or intraoperative complication.

Key words: Laparoscopic cholecystectomy, gall stones, conversion, cholelithiasis.

INTRODUCTION
Cholelithiasis is a common disease with a prevalence of 10-15% in the USA and about 16% in Pakistan1,2, mostly remain asymptomatic but symptoms appear when any complication develops.3 Ultrasonography is most useful investigation for diagnosing the gall stones or its complications like cholecystitis.4 Symptomatic gall stone disease can end up with its complications without prompt surgical intervention. Carl-Langenbuc performed the first successful cholecystectomy by open technique which remained the goal standard for the management of gall stones for about a century.5 Laparoscopic cholecystectomy performed for the first time in 1987 by Movret in France is now the gold standard for the treatment of symptomatic gallstones.6 It has replaced the open technique for the majority of 770,000 cholecystectomies performed in US each year.7

Laparoscopic cholecystectomy is the standard treatment for cholelithiasis. One of its limitations is the conversion into open procedure, which should not be considered as complication rather it is mature decision by the surgeons to avoid unnecessary lengthening of the duration of surgery. Once he encounters any difficulty or intra-operative complication. However, it can be avoided by proper case selection, improving hand-eye coordination and meticulous dissection.8

Laparoscopic cholecystectomy is preferable over open cholecystectomy for its lesser duration of hospital stay, lesser mortality and morbidity, early return to work and better cosmetic results.9 It is also considered for management of acute cholecystitis now a days.9 Laparoscopic cholecystectomy (LC) remains an extremely safe procedure with a mortality rate of 0.22-0.4%. Major morbidity occurs in approximately 5% of patients.10 Laparoscopic cholecystectomy is having certain disadvantages like its conversion into open cholecystectomy. According to some studies its conversion rate is 16-18%.11,12 Common causes for
conversion mentioned in literature are dense adhesions 66.6%, common bile duct injury 22.3%, gut injury 11.1%, and hemorrhage 50%. The rationale of this study provided a local statistical data about frequency and common causes of conversion of laparoscopic cholecystectomy into open cholecystectomy, where adequate expertise is in the phase of development.

MATERIAL & METHODS

This descriptive cross sectional study was conducted at surgical D unit, Lady Reading Hospital Peshawar Pakistan, from July 2014 to August 2015. Both male and female patients, above 18 years of age, admitted in surgical D unit with symptomatic gallstones, meeting the criteria were selected and included for the study by consecutive nonprobability sampling technique. Patients with clinically evident jaundice, common bile duct stones, acute cholecystitis, empyema gall bladder, liver cirrhosis and gall bladder mass on ultrasound, diabetes mellitus, coagulopathies on screening test, positive for hepatitis B and C viruses, previous abdominal surgery and pregnant women were excluded from the study. All patients were diagnosed taking detailed history, performing complete physical examination and investigations like ultrasound abdomen [for stones in GB, normal or thickened GB wall], and other base line investigations such as complete blood count, blood urea and serum creatinine, serum electrolytes, liver function tests and screening for hepatitis B & C viruses.

A written informed consent explaining the risks and benefits of the procedure was obtained from the patients fulfilling the selection criteria. All patients were operated under general anaesthesia. Laparoscopic cholecystectomies were performed by the same surgeon with at least 5 years’ experience of laparoscopic surgery knowing the details and inclusion of the patients in the study. Surgeon carried out all the operations through laparoscope by using standard 4-ports technique. Pneumoperitoneum was created through open technique and pressure was kept at 12 mm Hg. Pre-operative antibiotics were given at the time of induction of anesthesia and patients were followed throughout the procedure to look for conversion if any and its cause such as adhesions, common bile duct injury, hemorrhage and gut injury. Exclusion criteria were strictly followed to control confounders and bias in the study. The demographic and clinical data of all the patients was recorded in a proforma. The statistical analysis was performed using the statistical program for social sciences (SPSS version 17).

RESULTS

A total of 145 patients, 125 (86.2%) were women and 20 (13.8%) were men. The mean age was 40.65 years± 10.35 SD and age ranged from 20-68 years. Study population largely comprised of female patients of relatively younger age group with a female to male ratio is 6.25:1. There were 17 (11.7%) patients who required conversion to open procedure. Commonest cause being adhesions which was found in 8 (5.5%) patients followed by hemorrhage in 4 (2.76%) patients. Table 1 Moreover conversion was significantly more in male patients 30% as compared to 8.8% in females with p=value=0.0037 table 2.

<table>
<thead>
<tr>
<th>Table 1: Frequency of causes of conversion</th>
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<tr>
<td>Frequency n= 145</td>
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<tr>
<td>Conversion</td>
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<tr>
<td>Adhesions</td>
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<tr>
<td>Common bile duct injury</td>
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<tr>
<td>Hemorrhage</td>
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<td>Gut injury</td>
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<th>Table 2: Gender wise distribution of conversions</th>
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<tr>
<td>Conversion Total n=145</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>30%</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>8.8%</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>11.7%</td>
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</table>

DISCUSSION

Cholelithiasis is a common disease with a prevalence of 10-15% in the USA and about 16% in Pakistan. Patients mostly remain asymptomatic but symptoms appear when any complication develops. Symptomatic gall stone disease can end up with its complications without prompt surgical intervention. Cholecystectomy was performed by open technique for management of gall stones disease which remained the goal standard for the management of gall stones for about a century. Since its introduction in
1987, laparoscopic cholecystectomy rapidly gained popularity in modern times to the extent that it is now being regarded as the gold standard for treating symptomatic gallstones disease. Efforts are being carried out to minimize the hazards related to laparoscopic cholecystectomy by introduction of newer and advanced technologies. But now this is the era of minimally invasive or key hole surgery and performing laparoscopic cholecystectomy for gallbladder stones has revolutionized its management.

Laparoscopic cholecystectomy became an attractive treatment modality for symptomatic gallstones disease because of less scarring, shortened hospital stays, earlier returns to usual activities. Despite the fact that laparoscopic cholecystectomy has got many advantages but its conversion into open cholecystectomy is disappointing not only for patient but for surgeon as well. But conversion should not be considered as complication of the procedure rather it is mature decision by the surgeons to avoid unnecessary lengthening the duration of surgery once they encounter any difficulty or intra-operative complication. The conversion rate of 3.6% to 13.9% is reported in literature. The frequency of conversion in this study being presented is 17 (11.7%), which is according to that mentioned in literature. Our study population was younger, mean age 40.65±10.35 years. Daradkeh reported mean age of 47.2 years, whereas Bingener et al 40 years. The reported conversion rates for acute cholecystitis range from 12% to 37.5%. However, the rate of conversion is high amongst studies from the Asian countries as compared to those from western world. In most cases, dense adhesion around the gall bladder and as uncontrolled bleeding were the main reasons for conversion to the open procedure.

In this study commonest cause being adhesions 8 cases, followed by hemorrhage 4 patients. Moreover conversions were more in male patients. 30% as compared to 8.8% in females. This was similar to Ibrahim et al, Brodsky et a27 and Al Salamah28 also found male gender as a most significant determinant for conversion to open cholecystectomy. Tarcoveanu et al24 reported 24% conversion rate in males vs. 4% in females, whereas Lawrence et al25 reported 16.6% conversions in males vs 8.2% in females. Most conversions happen after a simple inspection or a minimum dissection, and the decision to convert should be considered as a sign of surgical maturity rather than a failure. Conversion should be opted for in the beginning and at the time of recognition of a difficult dissection rather than after the occurrence of complication.

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<th>Place</th>
<th>Year</th>
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<td>Vecchio et al24</td>
<td>USA</td>
<td>1998</td>
<td>114005</td>
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<tr>
<td>Butt et al23</td>
<td>Lahore</td>
<td>2006</td>
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<td>Saudi Arabia</td>
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<td>549</td>
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<td>Tarcoveanu24</td>
<td>Romania</td>
<td>2005</td>
<td>6985</td>
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<tr>
<td>Lawrence et al25</td>
<td>Singapore</td>
<td>2005</td>
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<tr>
<td>Memon W et al13</td>
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<td>2015</td>
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**CONCLUSION**

Laparoscopic cholecystectomy is the gold standard treatment modality in the management of symptomatic gallstones disease. One of its limitations is the conversion into open procedure. But conversion should not be considered as complication of the procedure rather it is mature decision by the surgeons to avoid unnecessary lengthening of the duration of surgery once they encounter any difficulty or intraoperative complication. Moreover it can be avoided by proper case selection, improving hand-eye coordination and meticulous dissection.

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Prevalence of Negative Autopsy in Peshawar, KPK
(An Autopsy based study)

Riaz Qadeer MBBS, DMJ1, Rizwan ul Haq M.Phil2, Anwar ul Haq MPH, DMJ3

ABSTRACT

Background: One of the aims of medico legal autopsy is to find out mode, manner and cause of death in any sudden suspicious death. The present study is about unnatural deaths in which after autopsy no definite cause of death was determined and it was difficult to comment whether death is natural or unnatural.

Place of Study: Study was conducted in the department of Forensic Medicine and Toxicology of Khyber Medical College, Peshawar.

Methodology: This descriptive study consist of total 400 autopsies performed on all referred cases from the police station of rural as well as urban areas of Peshawar district during the period from 1st January 2013 to 23rd May 2013.

Results: It was found out from the results that in 16 out of 400 autopsies performed (4% cases) the cause of death was not determined.

Key words: Negative autopsy, unnatural death, Peshawar, Pakistan.

INTRODUCTION

Unnatural death is caused prematurely against the order of the nature and it causes harassment as well as depression not only among the relatives of the deceased but also have negative impact on the society. Negative autopsy is defined as the autopsy in which the medical authority is unable to give a clear verdict about the cause, manner and mode of death. According to the medico legal system of Pakistan, the in charge of the dead body is police and has the authority to investigate all sudden suspicious unnatural deaths on behalf of the state. Aim of this investigations is to find out any foul play to help the judiciary to avoid miscarriage of justice. As dead body is property of the state so no consent of anyone is required for medico legal autopsy which is conducted by the authorized medical officer in a hospital on written request of police. Autopsy report is a legal document which helps the court in furthering justice. In this study postmortem examination of all 400 cases of suspicious deaths referred both from rural as well as from urban police stations of Peshawar district from 1st January 2013 to 23rd May 2013 was done. Autopsy report was issued and record was maintained. Informations like age, sex, resident of rural or urban area and other autopsy findings were noted in a performa which was designed for this particular study and results were analyzed as under.

In case of negative autopsy, the cause of death remain obscure, weather it is natural or unnatural. Violence and poisoning are the most common causes of unnatural deaths. Other causes are human errors, lack of medical knowledge in police officials, corruption, delayed autopsies, poorly trained medical examiners with ill equipped laboratories.

RESULTS

In all the 16 cases out of 400 no external sign of violence or struggle was found. It is obvious from the results that 43% dead bodies (7 out of 16) were not identified. Identification of dead body is the job of police which is done through the relatives or friends of the dead. Most probably these unidentified dead bodies were homeless. Apparently all these unidentified dead bodies were emaciated and seems to be addict of drugs like heroin, opium or hashish which are easily available in this area. About 80% (13 out of 16) were male and only 20% were females. Most of the cases (13 out of 16) of unnatural death (80%) were from urban areas and only 20% (3 out of 16) were referred from police station of rural areas of Peshawar. As for as age is concerned 60% were of age 50 or above and 40% were below 50 years. These results are compare able to the studies done on this topic. In one case alcohol was detected and
this body was putrefied. It is a known fact that alcohol is produced in the body after death during the process of putrefaction. Body was swollen due to accumulation of gases of putrefaction and hence personal identification was difficult and body was identified from his dress and other articles. Putrefaction also make it difficult to comment on the external signs of violence. In 30% (5 out of 16) cases though the body was fresh but the cause of death remain obscure on autopsy in spite of the help of forensic science laboratory. Poisoning and violence are the cause of unnatural death. In our study no poison was detected in any dead body. If poisoning is the cause then due to absence of external sign of violence, death more likely seems to be normal death. Authority is with the station head of the police (SHO) and if he is satisfied that death is natural then he can issue orders for burial. Cases of poisoning can be settled easily by police than cases of violence. People do not like the lengthy and exhausting court procedures hence only those cases are sent for autopsy which are not settled by the concerned SHO so the actual cases of negative autopsy are more than the cases referred for medico legal investigations.

### DISCUSSION

Death is a tragedy in whatever form, at whatever time and in whatever way it comes. Death can be natural or unnatural. The death is natural when it is due to any pathology (disease) or aging and is unnatural when caused prematurely against the order of the nature. Violence and poisoning are the usual cause of unnatural suspicious death. According to the medico legal system of Pakistan police is the in charge of dead body and investigate on behalf of the state whether death is natural or unnatural. Police is having less medical knowledge and this is the major drawback in our medico legal system. Poisons like heroin or cocaine are very rapidly metabolized in the body so it is difficult to detect these poisons after a few hours and any delay which may be deliberate or due to negligence in handing over the specimens to the forensic science laboratory may make it difficult to detect these poisons.

Chemicals used in the laboratory to detect the poison may not be fresh or apparatus may be in non working condition or the person doing the test may be incompetent or bribed. Other causes of negative autopsy include exchange of samples in the forensic science laboratory. The doctor doing the autopsy may not be well trained or history of the case is not provided to the forensic science laboratory along with the samples or less quantity of samples is taken. Cause of death may be electrocution and it may be missed by the doctor doing the autopsy on external postmortem especially if the involved area is hairy as on eye brow or the scalp. Similarly fang marks of snake bite if on hairy areas can be missed and poison in putrefied dead

<table>
<thead>
<tr>
<th>S/No.</th>
<th>AGE</th>
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</table>
body is difficult to detect. The cause of death may be vaso-vagal shock or spasm of the coronary arteries though the lumen of coronary arteries is found patent on autopsy. Generally heart attack will take place when the blockage of lumen of coronary arteries is 65% or more. Death is possible when the blockage of coronary arteries is less than 50% but due to emotional upset the individual may get spasm of coronary arteries leading to sudden death which may be unexpected for the close relatives. While dealing with cases of negative autopsy human error must be kept in mind.

CONCLUSION

It is possible that in spite of all efforts the cause of death may remain obscure due to various reasons and above all human errors and intension must be kept in mind. In developing countries like Pakistan the corruption may be the single major cause of negative autopsy.

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INTRODUCTION

Clubfoot or talipes equino-varus is the most common congenital orthopedic anomaly with an incidence of approximately 24 per 1000 live births. The words talipes means, talus (ankle) and pes (foot), and clubfoot denotes the club like appearance of foot. Talipes equino-varus is the most common variety of clubfeet (about 95%). Children with untreated clubfoot are still seen in the community. The deformity can be quite severe, with the sole of the foot pointing backward. The dorsum of the foot becomes the weight bearing surface, so that the child walks on the head and neck of the talus. Clubfoot results in severe handicap unless managed early. Untreated patients not only develop progressive increase in deformity associated with late adaptive changes, but also have poor function even after surgical correction.2

It is a hereditary foot deformity of unproven etiology, which affects both sexes (males more frequently than females). It may be unilateral or bilateral. It is often associated with other hereditary conditions, such as myelodysplasias, arthrogryposis multiplex congenital arid congenital dislocation of hip. The appearance of the effected foot and leg is atrophic.3

Flexibility of foot is lost to varying degrees depending on the severity of the deformity, ranging from much less severe deformity with the foot being in only a mild equinus and varus position, to a more severe form in which the entire foot may be in an equinus and varus position with the forefoot adduction and cavus deformity. The tibialis anterior and tibialis posterior muscles pull the first metatarsal and navicular into inversion. The plantar aponeurosis and muscles create cavus deformity and the anterior end of talus forms the dorsolateral bony deformity.4 There is an increased incidence in certain racial and ethnic groups with a much higher incidence if patient has a positive family history of clubfoot.5
this method of treatment, then surgery is needed. High incidence of recurrence of the deformity was reported by many authors, as (Dangelmajor 1961) reviewed 200 unselected cases of clubfoot demonstrated that 60% of cases required soft tissue or bony procedures. Inadequacy of primary surgery and post operative period immobilization resulted in a significantly high failure rate.

The best time to do the operation is debatable, but most of the surgeons are in favor of delay surgical intervention until the infant is approximately four to six months instead to do it in early days of infant’s life. Hoque, from his study has the conclusion that the best results were seen in children who were operated on between 1 and 3 years, for rigid clubfoot. The surgical procedures that are currently in use can be divided into three basic groups: those that involve soft tissue only, those that involve bone, and those that involve both soft tissues and bones. Procedures that involve bones are usually done in older children and sometimes may be regarded as salvage procedures.

Among the soft tissue procedures since the report of Turco (1971), “the postero-medial release (PMR), in which the posterior, medial and subtalar soft tissue contractures are released to permit the realignment of abnormal anatomy of bones and corrected alignment is secured with Kirschner-wires, has become the operative procedure of choice for most surgeons. Joseph recommended the Hemi-Cincinnati incision (i.e. medial half of the Cinematic incision) as the incision of choice for performing posteromedial soft tissue release operations on clubfeet in children younger than 2 years of age.

The rating system introduced by McKay in 1983, is an objective assessment of the clubfeet, it does not need any investigations, apart from clinical assessment and measurements. Aim of this study was to assess the outcome of resistant club feet managed by Turco’s approach.

MATERIAL & METHODS

This prospective hospital based observational study management of CTEV by modified Turco’s Posteromedial release in patient of less than 3 years of age was done between January 2006 to June 2006 in Khyber Teaching Hospital, a tertiary care hospital in Peshawar, Khyber Pakthoonkhwa. In this study only idiopathic clubfeet were included irrespective of their gender. Feet which did not correct by conservative measures were included. Patients of more than three years were excluded. Patients previously operated were also excluded.

The patients with clubfeet were seen and evaluated in the outpatient department (OPD) of the Khyber Teaching Hospital, and were graded according to the criteria of Cummings (1988) into mild, moderate and severe. Thirty Patients with grade II and III deformity were admitted in the ward, operated and then followed up for 6 months after their operation. On admission a detailed history and examination performed. Radiological assessment done The above mentioned assessments and measurements were carried out in the patients with grade II and III deformities, who had been on conservative treatment for variable time but did not get correction of the feet or who had not been on any treatment, and showed both clinical and radiological evidence of failure to achieve satisfactory correction of all components of clubfoot deformity. The patients were then scheduled for surgical procedure, the Turco’s posteromedial release, informed consent was taken from the father or close relatives of the patients.

RESULTS

30 patients with severe deformity, which did not correct with conservative measure, were scheduled for Turco’s postero-medial release (PMR). Out of these 30 patients 16 (53.33%) were male and 14 (46.67%) were female, with an average age of 13.6 months ranging from six months to 33 months. 7 (23.34%) patients had bilateral deformity while 23 (76.66%) had unilateral deformity. Only 4 (13.33%) patients had family history of clubfoot.

10 (33.33%) patients were from district Peshawar, 12 (40%) were from the nearby districts and areas such as Nowshera, etc 7 (23.33%) were from Tribal Areas (FATA) and only 1 (3.33%) was from Afghan refugees. None of our patients got wound infection. 7 patients did not complete their follow up after surgery. So by the end of study only 23 patients of those 30 operated for CTEV were available for evaluation. These 23 patients after study were graded according to modified McKay Rating System. 14 (68.86%) patients had excellent results scoring about 141—145 points, 4 patients (17.39%) had good results and 1 patient (4.34%) had fair results. 2 (8.69%) had poor results, 2 patients (8.69%) scored less than 73 points and were labeled as failure.

DISCUSSION

Talipes equinovarus is the most common orthopaedics anomaly. We receive considerable number of patients in our outpatient department with clubfeetof variant severity. In our study 30 patients who underwent Turco’s postero-medial release have a male to female ratio of 1.14 to 1, while this ratio is about 2 to 1 in the study conducted by Avid M. Drvaric. Bilaterality was noted in 23.43% of our cases which was about 50% in study by David M Drvaric while in
Out-Come of Resistant Congenital Talipes Equino-Varus Deformity by Modified Turco’s Postero-Medial Release

Yaraamoto it was more than 30%.16,17,18

About 23% patients were from areas that are nearer to Peshawar, while the remaining 23.33% patients were from remote areas of KPK, that is Tribal areas (FATA), southern districts of KPK (Bannu, Dera Ismail Khan and Afghanistan. In our study only 4 (13.33%) patients had positive family history of clubfoot deformity while, family history was present in 8% of patients in a study conducted by Harold Walker.19

In our study 43.45% patients had received conservative treatment (i.e. serial casting) right from initial months of life, while the remaining 57% of the patients had no conservative treatment till the time of presentation. This is mainly because of low socio-economic and educational status of the parents of these patients, because of illiteracy people do not consider the significance of early consultation and treatment. Their low socio-economic condition too hinders them in seeking treatment for their ailments.

The compliance of the patients was poor in our patients and even in this short term review of one year, we lost 7 patients out of 30 patients, thus the follow up rate was 77% at the end of one year, while Hutchins presented a follow up rate of 70% after a mean follow up of 15 years and 10 months. Harold Walker has about 95% of follow up rate in his patients treated for clubfoot deformity.19 This poor compliance in follow up in our patients was mainly because of the ignorance, illiteracy and low socioeconomic conditions prevailing in our society.

The degree of correction i.e. the results were measured according to the McKay rating system in these 23 patients by the end of 6 months follow up period. 14 patients (68.86%) had excellent results, 4 patients (17.39%) had good results, one patient (4.34%) had fair results. While in the remaining 2 patients (8.69%), had poor results and two patients (8.69%) scored less than 73 points on McKay’s scoring table and these were considered as failure while Turco reported 83% satisfactory results, 12% fair results and 5% failure with this surgical procedure.20 Similarly, Thompson et al achieved excellent results in 86% of cases corrected with Turco’s postero-medial release.11 On the other hand, Hoque MF has got excellent-good results in 75% rigid clubfeet, and has 11% fair and 13% poor results with Turco’s Postero medial release13,14 in patients of 9 months to 4 years of age, Otremski achieved full correction, of equinus in 98%, heel varus in 91%, cavus in 85% and forefoot adduction in 91% of cases.

The main residual deformity was forefoot adduction, it was about 5 degrees in 6 patients and more than 5 degrees in another 6 of our patients. Heel varus was present in 6 patients, while it was neutral in remaining 24 patients. The results of our study remained excellent to good in about 85% which are comparable to some other studies (e.g. by Thompson, Hoque MF, Otremski, Turco).13,14,21

The cause of relapse in most of the cases is primarily mismanagement from the surgeon side, as well as non compliance from the patients. Severity of the deformity and natural history of the disease also contribute to the recurrence of various components of the deformity.

CONCLUSION

All patients with clubfeet should be started on conservative treatment as soon as possible. All the clubfeet resistant to conservative treatment do not need extensive releases (as complete subtalar release), but could be corrected with less extensive procedures as postero-medial release of Turco with about 80% excellent to good results in clubfeet resistant to conservative treatment.

REFERENCES


Out-Come of Resistant Congenital Talipes Equino-Varus Deformity by Modified Turco’s Postero-Medial Release


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INTRODUCTION

Death may be natural or unnatural and unnatural death is due to violence or due to poisoning. Poisons are chemical compounds which may be organic or inorganic. Organic poisons may be of animal origin or plant origin where as inorganic compounds may be metallic or non metallic. Poisoning may be suicidal or homicidal but accidental poisoning is also possible. A good suicidal poison must be cheap, easily available, having no smell or taste, sure in action and death should be rapid and painless. Suicidal poisons of choice are cyanides, opium or barbituates but cyanides are costly and not within reach of a common person whereas rat killing (rodenticides) tablets, powder or paste which contain arsenic, thallium, yellow phosphorus or zinc phosphide are cheap and easily available so are commonly used to commit suicide. Similarly tablets which are used as fungicides / germicide to preserve food grains like wheat, rice or maize are very toxic as they contain organo-phosphorus compounds like Zinc phosphide or Alumunium phosphide or salts of mercury like mercuric chloride or mercuris chloride.

These tablets are used to preserve seeds for the growth of next crop and are within reach of a common person to be abused. Modern life is easy due to facilities which is making life more complex and these complexities of life are cause of unrest and tension. People are taking anxiolytic drug, mood elevating drugs or sleep inducing pills which may lead to addiction, psychiatric problems like automatism or changes in behavior or death. Drugs of addiction like opium, heroin or canabis indica are easily available in KPK. Addict is a burden for the family as well as for the society due to physical mental & moral degeneration. Sometimes two drugs are taken simultaneously and due to synergism the combined effect produced will be more than the sum of effects produced by each drug alone. This is true when alcohol is taken along with benzodiazepines. Dhatura is another poison which is usually offered in sweets to the passengers at bus stands or at railway stations and aim is to facilitate robbery but accidental death may occur due to over dose. Dhatura is mostly offered to passengers so also called road poison.

Accidental poisoning of farmers while doing spray of herbicides on the crops can be prevented by taking precautionary measures. Suicidal and homicidal deaths can be controlled by improving socioeconomic conditions of the people and by providing better psychiatric treatment facilities, educating through religious injunctions.

MATERIAL & METHOD

It is a retrospective descriptive study conducted in the Department of Forensic Medicine & Toxicology of Khyber Medical College, Peshawar where all
autopsies are carried out for the district Peshawar. Total 400 autopsies were performed from 1st January to 23rd May 2013. All these dead bodies were referred by the police station of rural as well as urban areas of Peshawar for the medico legal autopsy to find out mode manner or cause of death and any other crime associated with the death. Autopsy report was issued and record of each case was maintained. From this record information like age, sex, from rural or urban areas and cause of death were entered in a performa which was designed for this particular study and results were analyzed as under.

RESULTS

<table>
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<th>S/No</th>
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<td>Arsenic detected</td>
<td>Fresh body</td>
</tr>
<tr>
<td>15</td>
<td>28</td>
<td>Female</td>
<td>Yes</td>
<td>Nil</td>
<td>Zinc phosphide detected</td>
<td>Fresh body</td>
</tr>
<tr>
<td>16</td>
<td>50</td>
<td>Male</td>
<td>Nil</td>
<td>Yes</td>
<td>Benzodiazepines detected</td>
<td>Fresh body</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>Male</td>
<td>Yes</td>
<td>Nil</td>
<td>Anaphylactic shock (drug reaction)</td>
<td>History of injection of Ampicillin by a quack</td>
</tr>
<tr>
<td>18</td>
<td>25</td>
<td>Female</td>
<td>Yes</td>
<td>Nil</td>
<td>Zinc phosphide detected</td>
<td>Fresh body</td>
</tr>
</tbody>
</table>

DISCUSSION

In total 18 out of 400 (4.5%) deaths as no external sign of violence was noted so body viscera were sent to the laboratory for the detection of any poison and death due to poisoning was confirmed. Among these un natural deaths due to poisoning 80% were males (15 out of 18) and only 20% were females, 60% were from urban areas and 40% were from rural areas, 45% were of age 30 or below and 55% were of age above 30 years and no one was of age above 55 years. Poison detected in 30% cases was organo-phosphorus compound, in 15% cases was benzodiazepines and in 40% cases it was opium or its derivatives. In two cases with history of abduction the cause of death was overdose of opioids.

Drugs are chemicals and act as weapon to cause injury or death and this may be possible due to action of the drug or due to reaction of the drug. In one case arsenic was detected as cause of unnatural death. Arsenic is tasteless, odorless and is easy to offer in food or in the drink like coffee. Arsenic is very toxic and only a few milligrams prove fatal. In a child of age 5 anaphylactic shock due to reaction of the Ampicillin drug was noted as cause of death. One case of accidental poisoning due to carbon mono oxide was noted. Results of our study are comparable to the study done earlier on this topic. Pakistan is a country where most of its population is residing in villages, having agriculture as profession and are less educated. Both ladies and
Poisoning as Cause of Un-natural Deaths in Peshawar (KPK)

gents are working in the fields and a former doing spray of rodenticide, fungicide or herbicide in his fields is prone to accidental poisoning of organophosphorus compounds which is the main content of the spray and is absorbed from the intact or broken skin as well as from respiratory tract through inhalation. Most cases of suicidal poisoning are due to rodenticides or due to benzodiazepines especially when taken along with alcohol.

According to the medico legal system of Pakistan the in charge of the dead body is police and on behalf of the state investigate all sudden suspicious deaths and aim of this investigations is to find out any foul play to avoid miscarriage of justice. As dead body is property of the state so no consent of anyone is required for medico legal autopsy. In suicide cases (may be by poisoning or by other means) as no one is to be punished so medico legal investigation like autopsy is not required. In such cases only psychological autopsy is done to prevent such incidences in the society in future. Unnatural deaths due to poisoning apparently look like natural death so most of the time such cases of deaths are settled by the police as station head officer (SHO) has the authority. People do not like autopsy of their relatives and if they do not settle the case with the police only then SHO will send the dead body for autopsy. The actual cases of deaths due to poisoning are more than cases sent for medico legal autopsy.

CONCLUSION

Accidental poisoning of farmer while doing spray of herbicides on the crops can be prevented by taking precautionary measures. Suicidal and homicidal deaths can be controlled by improving social justice, socioeconomic condition of people, by providing better psychiatric treatment facilities and by education of people especially the religious education.

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INTRODUCTION
Disordered eating attitudes and behaviors are common in adolescents. These are group of conditions characterized by abnormal eating habits which include binge eating disorder, bulimia nervosa and anorexia nervosa. These are included in psychiatric illnesses, and are preoccupation with body weight, shape and diet. These eating disorders frequently are associated with psychiatric illnesses like depression, substance abuse and anxiety disorders.

Anorexia nervosa is extreme fear of gaining weight, in which people try to maintain a weight far less than normal. Bulimia is characterized by a cycle of binge eating, followed by attempts to remove unwanted calories. People with binge eating disorders often eat an uncontrollable, large amount of food during the binges.

Students showing eating disorders are associated with different factors, co-relating with socio economic group, ethnicity and relationship status. Early detection of such factors are important at an early stage, remedying to greater efficiency for future physicians.

Medical students are predisposed to eating disorders due to a combination of biological, psychological and/or environmental factors. In western countries, studies have shown prevalence of anorexia nervosa to range from 0.1%-5.7%, while bulimia nervosa ranged from 0.3%-7.3% in female subjects. A study conducted on college students reported 3.8% prevalence of bulimia nervosa in females and 0.2% in males in some other study it was found that 4.7% of female college students with eating disorders.

Medical students are associated with high levels of...
Eating Disorders in Medical Students of Islamabad, Pakistan

stress that stands as a critically important causative factor of eating disorders. Thus, it is quite important to analyze all such instabilities in medical students who are an asset for the future of the country. Studies have been conducted in western scenario to assess eating disorders in medical students. A study from US showed that 15% of the female medical students had history of eating disorders.8

EAT-26 has not been established as the sole mean of identifying eating disorders, but studies have shown that it can be used as a screening instrument in part of a two-stage process in which individuals who score above 20 are evaluated for eating disorders in a diagnostic interview. In Pakistan, a study conducted in Lahore among 369 school girls and another study conducted in Mirpur among 271 school girls revealed one case of bulimia and no cases of anorexia, although five girls from Lahore also suffered from partial syndrome bulimia nervosa.9,10 Another survey from Lahore among 111 volunteers showed an occurrence of two cases of bulimia nervosa and another two cases of eating disorders not otherwise specified.11

While eating disorders are characterized as a mental health condition, they have the potential to lead to other serious physical health problems. Keeping such ominous medical consequences in view, it is naturally alarming that the future physicians of Islamabad, in a previous study done in Karachi prone to such stressful conditions might be at significantly high risk of contracting eating disorders that would hamper the availability of dependable medical services in future. The earliest these disorders are diagnosed and assessed, the better the chances are for enhanced treatment and better recovery.12 Therefore, we intend to undertake a descriptive study to assess the incidence of high-risk of eating disorders among medical students of Islamabad.

MATERIALS & METHODS

This was a descriptive cross sectional study, conducted in a private medical colleges Islamabad using convenient sampling method after taking ethical permission between 1st January, 2014 and 28th Feb, 2014. The study included 75 preclinical undergraduate medical students. After taking verbal consent students completed english version eating attitude test (EAT-26) the questionnaire were presented to them.

The EAT-26 survey comprised of three sections (A, B, and C). Section A dealt with demographics, section B contained 26 questions relating to eating attitudes and was used to calculate the score by addition of the values of the responses. Questions assessed various aspects of distorted eating behaviour, including bulimic tendencies, body image perception and degree of willful control over eating behavior. A score above 20 for Section B was considered diagnostic of anorexic behaviour. EAT-26 has not been established as the sole mean of identifying eating disorders, but studies have shown that it can be used as a screening instrument in part of a two-stage process in which individuals who score above 20 are evaluated for eating disorders in a diagnostic interview. In this manner, early identification of an eating disorder can lead to earlier treatment thereby reducing morbidity and mortality.

The Eating attitude test-26 (EAT-26) is a validated self-administered questionnaire widely used to measure eating disorders.11 It comprises of 26 questions for which, scoring is done on a 6-point scale from always to never. Total sum of Eat-26 scores range from zero to 78.12,13 The data was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 16. Relevant frequency and percentages were calculated for qualitative variables whereas means ± standard deviations were calculated for quantitative variables. P-values were also obtained by t test to determine the significance of the results.

RESULTS

There were 75 second year MBBS students present in the lecture hall completed EAT 26 questionnaire. Among those 51 were female while 24 were male. Figure 1 shows the frequency distribution of EAT 26 scores of the students. This study showed the mean score of EAT 26 in female (n=51) is 14.90+_9.6 SD and in male (n= 24) 15.60 +-9.75 difference between male and female was (p=.000)highly significance. Mean EAT 26 score of the students was 15.13+_9.6 SD which is below cut off value but when we look at histogram, we find 22.3 % cases of EAT scores above cut off value of 20 indicating presence of abnormal eating behaviour Which requires further investigations.

The presence of EAT 26 score above cut off value of 20 was found in n=11 (15 %) females and n=6 (8 %) of male students . Cut off score above 20 was present in 22.6 % of the students which is quite high.

Figure : frequency table showing EAT 26 score

![EAT-26 Score Frequency Table](image)
Table 1: descriptive statistics of study subjects

<table>
<thead>
<tr>
<th>Sex</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>14.9020</td>
<td>51</td>
<td>9.61094</td>
</tr>
<tr>
<td>Male</td>
<td>15.6000</td>
<td>24</td>
<td>9.75961</td>
</tr>
<tr>
<td>Total</td>
<td>15.1316</td>
<td>75</td>
<td>9.60048</td>
</tr>
</tbody>
</table>

Table 2: t-test showing significance between scores of groups

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13.740</td>
<td>75</td>
<td>&lt;0.001</td>
<td>15.13158</td>
<td>12.9378 - 17.3254</td>
</tr>
</tbody>
</table>

Table 3: Distribution of normal and abnormal EAT 26 score among participants

<table>
<thead>
<tr>
<th>EAT 26 Score</th>
<th>Female (total n=51)</th>
<th>Male (total n=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>n = 40 (53% )</td>
<td>n=18 (24%)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>n =11 (14.6)</td>
<td>n= 6 (8%)</td>
</tr>
</tbody>
</table>

DISCUSSION

Our study reports that significant proportion of medical undergraduates are at high risk to suffer from eating disorders with (22.6%) individuals scoring above the threshold for EAT-26 questionnaire. This is much more than as compared to recently reported eating disorder symptoms in 9.59% among Latino college students.14 This strengthens the fact that eating disorders are a current mounting concern in our region in relation to other parts of the world. Eating disorders, although relatively uncommon, represent a public health concern because they are frequently associated with other psychopathology and role impairment, and are frequently under-treated.15

EAT-26 is reliable, the factor structure is different from that obtained in clinical groups, and the EAT-26 is significantly correlated with body image, weight, anti diet.16 In a previous population based study it was found that 1200 women aged 15 to 24 years suffer from anorexia nervosa, and around 4700 suffer from bulimia nervosa. Among young people aged 11 to 15 years an estimated 600 girls suffer from an eating disorder. A survey of eating disorders among 271 schoolgirls was conducted in Mirpur, Pakistan, using a new Urdu translation of the Eating Attitudes Test (EAT-26).11 Individuals scoring above 20 on the EAT were interviewed to determine whether an eating disorder was present. One case of bulimia nervosa (DSM-III-R) was identified. This result is compared with surveys conducted by the authors among Asian schoolgirls in Bradford, UK, and in Lahore, Pakistan.9,18,19 Eating disorders are among the most common psychiatric disorders in young women. Early detection and treatment improves prognosis.20

Our study examined gender differences in eating attitudes and behaviors which is similar to a study done in Karachi in a sample of 471 undergraduate college students. It was found that according to EAT-26, 22.75% individuals were found to be at high-risk of eating disorders, with 87.9% females and 12.1% males. Similar to our study in Karachi 21.5% prevalence of anorexia nervosa, abnormal EAT scores (>20), were found in 6% of males and 15% of females.23

Eating disorders particularly anorexia nervosa is reported to derange several system with resultant complications ranging from purpura, liver dysfunction, osteoporosis, diabetic complications to acrocyanosis. Particularly, anorectic patients have been reported to die at a premature age possibly from one of the above stated medical complications.24,25 This disconcerting information should come in the knowledge of such individuals suffering from the disorder or at a high risk of developing one, who involve grossly in unhealthy dieting or purging cycle, particularly females.

**Limitations:** The limitations of our study includes that we have focused only on medical students in colleges from urban set up. Further studies should be carried out which checks the pattern of eating disorders in rural set up. Furthermore, the most important limitation.

Further surveys needs to be conducted that will correlate socio economic group, ethnicity and relationship status. Early detection of such factors causing eating disorders is important as having a significant impact in treatment of such disorders at an early stage with resultant greater efficiency of performance by future physicians.26

CONCLUSION

Our sample of student show risk of developing eating disorders which should be investigated to find its association of different factors. Further surveys needs to be conducted that will correlate socio economic group, ethnicity and relationship status. Early detection of such factors causing eating disorders is important as having a significant impact in treatment of such disorders at an early stage with resultant greater efficiency of performance by future physicians.

ACKNOWLEDGEMENT

- Special thanks to our great teacher and mentor Professor Yasin Durrani for critical review of the
• I would like to thank my students who participated in the study.
• I would like to thank the following: Dr. Mohammad Usman for helping in revision of manuscript.
Maryam Hafeez 4th year BDS students for assembly and compiling of data.
Other authors are equally commendable for their contributions.

REFERENCES
William Campbell from Ireland and Satoshi Omura from Japan shared award of Noble Prize for discovering drugs against parasitic diseases.

Tu Youyou, Satoshi Omura, William Campbell

The noble assembly at Sweden’s Karolinska Institute announced noble prize to Dr. William Campbell, aged 85, Research Fellow Emeritus at Drew University, Madison, New Jersy discovered Evermectin derivative to treat River Blindness while Dr. Satoshi Omura aged 80 years, Professor Emeritus at Kitasato University Japan to treat elephantiasis (filariais).

Dr. Tu Youyou aged 84, from China Academy of Traditional Medicine, has discovered Artemisinin, from the plant Artemisia annus, a Chinese herbal drug replacing Chloroquine and Quinine for treating Malaria.

These two discoveries have provided 3.4 billion people with powerful new means to combat these debilitating disorders, mostly living in poor countries.

The basic research carried out by these noble laureates in Chemistry has not only deepened our knowledge, how our cells function to the understanding molecular causes several hereditary diseases and mechanism behind cancer and aging, which could lead to the development of life saving treatments. The three scientists share the sum of US dollars: 950,000/- as the three have opened a dazzling frontier in Medicine by unveiling how the body repair DNA mutations that can cause sickness and contribute to aging. DNA – deoxyribonucleic acid is a chemical code for making and sustaining life. Cells divide and replicate billions of time throughout our life time. DNA can also be damaged by strong sunlight and other environmental factors.

Dr. Aziz Sancar, aged 69 years born in Turkey is a medical doctor, went to University of Texas in Dallas, now working as Professor of Biochemistry at University of North Carolina (USA). He discovered the mechanisms used by the cell to fix damage by ultra-violet radiation.

Paul Modrich (USA) aged: 69 years born in Mexico has a great love for natural world. He discovered a complex DNA-mending process called Mismatch-Repair. He is working as Professor of Bio-chemistry at Duke University.

Thomas Lindahl (Sweden) aged: 77, He is an Emeritus Director of Cancer Research at Clare Hill Laboratory in U.K. He identified repair - the basics of his research work.
Takaaki Kajita of Japan, director of the Institute for Cosmic Ray Research and professor at the University of Tokyo.

Dr. Tu youyou through a difficult journy

*China’s First Noble Laureate for Medicine.*

Dr. Tu youyou aged 84, being a top expert in the field of Malaria eradication since 1967, spearheaded the research on the orders of President Mao Zedong, as Malaria was killing the troops in North Vietnam war against United States. Her work led to the discovery of Artemisinin, which is now a standard drug with most rapid action against Plasmodium falciparum malaria regimen credited having saved millions of lives in Africa and Asia. Premier Li Keqiang described it as “an expression of prosperity and progress of Chinese Science” and a huge contribution of Chinese Traditional Medicine to the human health. The state media has pledged to preserve her birth-home in Zhegiang in Ningbo City.

Dr. Tu has been described as a “Three Without” scientist. One: Without doctoral degree, two: no foreign training or experience, three: no prestigious academic title from the Chinese Academy of Sciences. Dr. Tu born in 1930, joined the University School of Medicine in Peking and graduated from the Department of Pharmacology. Dr. Tu married her former classmate Li, a metallurgy engineer. They bore two daughters. She joined the Academy of Chinese Traditional Medicine to fine a new anti-malarial drug as the old drugs were losing its effectiveness. Tu studied at the Department of Pharmaceutical Sciences, and graduated in 1955. Up until 1979, there were no postgraduate degree programs in China, and China was largely isolated from the rest of the world. Tu is now regarded as a representative figure of the first generation of Chinese medical workers since the establishment of the People’s Republic of China in 1949.

In 1967, during the Vietnam War, Ho Chi Minh, the leader of North Vietnam, which was at war against South Vietnam and the United States, asked Chinese Premier Zhou Enlai for help in developing a malaria treatment for his soldiers resistant to chloroquine. Because malaria was also a major cause of death in China. Scientists worldwide had screened over 240,000 compounds without success. One compound was effective, sweet wormwood (Artemisia annua), which was used for “intermittent fevers,” a hallmark of malaria. Tu says she was influenced by a traditional Chinese herbal medicine source. “A handful of qinghao immersed with two liters of water, wring out the juice and drink it all.” Tu realized the hot water had already damaged the active ingredient in the plant; therefore she proposed a method using low-temperature to extract the effective compound instead. The animal tests showed it was completely effective in mice and monkeys.

Since it was safe she conducted successful clinical trials with human patients. Her work was published in 1981, she presented the findings relating to artemisinin at a meeting with the World Health Organization. She was promoted to a Researcher equivalent to the academic rank of a full professor in 1980. In 2001 she was promoted as academic advisor for doctoral candidates. Currently she is the Chief Scientist in the Academy. Tu had been obscure for decades, and is described as “almost completely forgotten by people”.

Incidently, she found in the Manual of Clinical Practice & Emergency remedies and mention of a sweet wormwood Artimisia annua (Qinghao in Chinese) being used for treating Malaria during the Eastern Jin Dynasty in AD 317-420. Dr. Tu is the first scientist to test the efficacy of the drug in mice and monkeys and later on in the humans and published the results in 1977 after 3 decades. The drug was used in 200 million cases, where 600,000 deaths occurred before the start of this medication. She won the Laskar Prize in medical research in 2011. She has a poor health ad suffering from Diabetes. She has a message “It needs an innovative spirit to discover new things”.

Ophthalmology Notebook
Artemisinin known as qinghaosu, possess the most rapid action of all current drugs against Plasmodium falciparum malaria. It was discovered by Tu Youyou, a Chinese scientist, awarded the 2015 Nobel Prize in Medicine for her discovery. Treatments containing an artemisinin derivative (artemisinin-combination therapies, ACTs) are now standard treatment worldwide for P. falciparum malaria. Artemisinin is isolated from the plant Artemisia annua, sweet wormwood, an herb employed in Chinese traditional medicine. A precursor compound can be produced using genetically engineered yeast.

Where All Ophthalmologists Meet:

DISCOVER NEW IDEAS, LATEST TRENDS & HOTTEST TOPICS

PARTICIPATE AT One Place:
where experts and thought leaders shape our profession

BE ENERGIZED & GET INSPIRED

From: OPHTHALMOLOGY UPDATE
A national conference on consensus, guidelines and curriculum development in Undergraduate Medical Education in Pakistan was held at Rawalpindi Medical College - a torch bearer institution in the country to meet the challenges in Medicine. Delegates called for curriculum re-design that include recently discovered diseases and research in order to improve and modernize health care facilities. The event was arranged by the premier education centers of Pakistan i.e. Higher Education Commission (HEC), Pakistan Medical and Dental Council (PMDC), University of Health Sciences (UHS), Rawalpindi Medical College (RMC) with the active collaboration of Pakistan Medical and Research Council (PMRC), Islamabad, Dow University of Health Sciences (DUHS) Karachi, Foundation University, Rawalpindi, Riphah International University (RIU), Islamabad, Isra University Islamabad (IUI), Khyber Medical University Peshawar (KMU), Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad, Shifa Tameer-e-Milat University (STMU), Islamabad and Association for Excellence in Medical Education (AEME).

More than hundred delegates, including Principals of Medical Colleges from all over Pakistan, faculty members and experts participated in the various sessions. The Principal of Rawalpindi Medical College & Chief Executive of Allied Hospitals, Dr. Muhammad Umar called curriculum development as one of the most important issues for medical students. Experts would focus on the undergraduate medical education, curriculum, research and academic accreditation.

**Inaugural address of Prof. Muhammad Umar**
Principal, Rawalpindi Medical College & Allied Hospitals, Rawalpindi

The Medical Education all over the world is transiting through a revolution as regards its concept and practice. There is a need to introduce the most up-to-date and effective modalities of medical education in Pakistan also, so that the private and public sector under-graduate institutions can follow the suit. Rawalpindi Medical College in collaboration with University of Health Sciences, Pakistan Medical and Dental Council and Higher Education Commission have envisioned to spear-head this initiative and focus on the areas of undergraduate medical education, curriculum, research, and academic accreditations with degrees and diplomas. To set the foundation, the RMC hosted a three day conference from the 11th to the 13th of September, 2015.

Curriculum development is one of the most important issues. Despite the PMDC providing outlines for introducing the integrated medical curriculum, most institutions are unaware of it. A hue and cry about the deplorable situation and the need to update curriculum has been raised for decades but the situation in most medical colleges continues to be deplorable. Various models for curriculum development are suggested and practiced in various parts of the world but for the most part they're not practiced in Pakistan. An integrated modular system of instruction has been employed in various medical colleges in Pakistan. It is high time to assess the pros and cons of that system, and the challenges faced in its implementation are based on our experience. Universities around the country, including UHS, are offering diplomas in various disciplines. The scope of these diplomas remains to be gauged.

**Dr. Muhammad Aslam**
Chairman, Board of Management (BOM)
Rawalpindi Medical College, Rawalpindi

Board of Management (BOM) Rawalpindi Medical College (RMC) occupies a unique position in the public sector s with a well-developed component of research
for health care needs and undergraduate courses that train the sharpest minds of the country, and diverse post-graduate training programs. It is thus high-time that now research in medical education be taken as an important initiative and we share our experiences with other colleagues around the country and provide them a unique platform for research in medical education. This is also an opportune time for us to interact with the stake-holders in the corridors of power and to take the right steps towards practicable solutions.

Participants:
1. Current Status of Undergraduate, Medical Education in Pakistan Maj. Gen. (R) Azhar Kiyani President PMDC.
2. Current Status of Research in Medical Institution of Pakistan, Prof. Mukhtar Ahmed Chairman, Chairperson. HEC.
3. Current Statistical data of University Medical Education in Pakistan, By Prof. Abdul Majeed Ch.Principal, University of Health Sciences (UHS).
5. Ideal Curriculum-First World Model By Prof. Umer Ali Khan, Pro-Vice Chancellor, Isra University, Islamabad.
6. Existing Curriculum Model in Pakistan By Prof. Syed Hasan Shoaib, Head of Medical Education Department, Shalamar Medical & Dental College, Lahore.
9. Standardization of Postgraduate, Training Program By Prof. Khalid Masood Gondal, Professor of Surgery, King Edward Medical University, Lahore.
10. Existing University Postgraduate Basic and Clinical Training Programs in Pakistan By Maj. Gen. (R) Prof. Muhammad Aslam Vice Chancellor University of Health Sciences Lahore.

Bhurban Declaration of Medical Education 2015
The Participants after deliberation agreed on following statement:

Maj Gen (R) Prof. Muhammad Aslam
Vice Chancellor

University of Health Sciences (UHS), Lahore.

1. Undergraduate Curriculum of MBBS would be an Integrated Modular Curriculum commencing MBBS induction 2015-16.
2. The clinical rotation in final year MBBS training should be converted to clinical clerkship.
3. The Internal Assessment 60% and Annual University Exam 40% would be practiced. Student has to pass in both Internal Assessment and University Annual Assessment separately. If student fails in Internal Assessment he will not be eligible to appear in University examination. Pass marks will be determined by standard setting.
4. Research, medical ethics, professionalism, patient safety, behavioral and social sciences will be integral part of the curriculum and will be taught in a longitudinal manner.
5. The Postgraduate degrees (MD, MS, MD’s), Diplomas, M. Phil and Ph. D need another elaborate meeting to formulate the guidelines.
6. The proposed document of MBBS curriculum will be mailed online to all the participants of the conference with the request for vetting, addition, deletion, suggestions and feedback for its improvisation with the request to respond within in a fortnight to Dr. M. Junaid Sarfraz Khan, Pro-VC, UHS, Lahore.
7. Final document of the guidelines for curriculum will be presented to HEC and PMDC for approval within a month from today.
International Faculty for the Lahore Ophthalo 2015

Dr. Michael Brennan, USA
Prof Karl Golnick, USA
Marshiel Williams, USA

Dr. Con Moshgrove, Australia
Dr. Sajjad Mughal, UK
Dr. Jolly Gilhotra, Australia

Dr. Umar K Mian, USA
Dr. Yasser Khan, Canada
Dr. Guarav Shah

Dr. Ronald Gentile, USA
Dr. Rajvardan Azad
Dr. Prashant Agnihotri, India
LAHORE – Heart of Culture & Seat of Learning

By: Farheen Toor, M.A
A Former Student of Oriental College, Lahore

Lahore is the capital of Punjab province, appeared for the first time under Anandapala – the Hindu Shahi king who is referred to as the ruler (Hakim-i-lahur). It is the 16th most populous city in the world and important historical center in South Asia. Abul Fazl, a historian of King Akbar Era (1584) termed it a great city. In fact, Lahore is the main cultural, economic, political and educational hub of Pakistan and reached the zenith of its architectural glory during the Mughal rule from 1524 to 1752.

According to a legend, Lahore known in ancient times as Lavapura was founded by Prince Lava (or Loh), the son of Sita and Rama, the king of Ayodhya and an avatar of the Hindu god Vishnu according to the Ramayana epic. The city of Kasur was founded by his twin brother, Prince Kusha. Lahore Fort has a temple dedicated to Lava (also pronounced Loh-awar) and Iravati (Ravi). The oldest authentic surviving document about Lahore was written in 982, Hudud al-’Alam held in the British Museum. Historians trace the history of Lahore as far back as 4000 years ago but it has been proved that Lahore is at least 2,000 years old. Chinese pilgrim Hieun-tsang, visited the city in 7th century. Lahore was invaded by Chengiz Khan in 1241 and Timur captured the city in 1397.

Lahore successively served as the capital of the Shahi kingdoms in 11th century, the Ghaznavids in the 12th century, the Ghurids in the 12th and 13th centuries the Mughals in the 16th century, Durranis around 17th century, and Sikhs from 1802 to 1849. In mid 19th and early 20th century it remained under the British Rule.

Sultan Mahmud of Ghaznavi, built city gates in 1037-1040 under Malik Ayaz, (as recorded by Munshi Sujan Rae Bhandari, author of the Khulasatut Tawarikh in 1695-96). The tomb of Malik Ayaz can still be seen in the Rang Mahal commercial area. After the Ghaznavid Empire, Lahore was ruled by various Turko-Afghan dynasties like the Khiljis, Tughlaqs, Mamluk, Sayyid and Lodhis and Durranis. During the reign of Qutb Din Aibak, 1606-1610 (his mausoleum is in Anarkali), Lahore was known as the ‘Ghazni of India’. Scholars and poets from Kashghar, Bukhara, Samarkand, Iraq, and Herat, gathered in Lahore and made it a city of learning. Lahore was the headquarters of Mughal rule during Akbar’s reign between 1584 to 1598.
Wazir Khan Mosque
Sacred Heart Cathedral
Tomb of Jahangir
Lahore Museum
Government College University
Gaddafi Stadium
Tomb for Allama Iqbal
Lahore Railway station
Samadhi of Ranjit Singh