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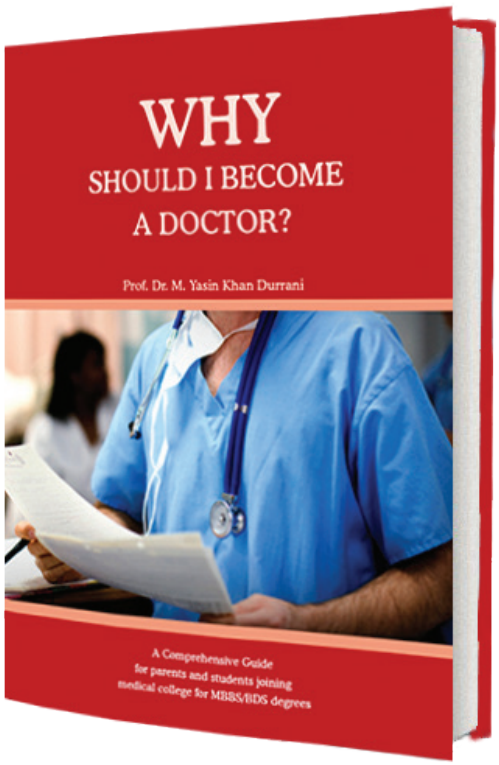

A Comprehensive Guide for Parents and
Students joining Medical College for MBBS/BDS degrees

WHY SHOULD I BECOME A DOCTOR?

(First Edition)

by

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وَاِذَا قُرِئَ الْقُرْآنُ فَاسْتَمِعُوْا لَهٗ وَاَنْصِتُوْا لَعَلَّكُمْ تُرْحَمُوْنَ

اور جب قرآن پڑھا جائے تو توجہ سے (کان لگا کر) سنا کرو اور خاموش رہو تا کہ تم پر رحم کیا جائے

پارہ 9، سورۃ الاعراف آیت 204

Editorial

CONSIDERING OCULAR CHANGES & MANAGEMENT IN PREGNANCY

There are different ocular manifestations in normal pregnancies with severity of symptoms in pre-existing eye diseases especially in women becoming pregnant later in life. With the increasing age there is a greater susceptibility to health issues including eye diseases, especially in lactating mothers. Although most of the symptoms resolve during postpartum period, yet the symptoms in few cases persist due to pre-existing diseases like Diabetes and Hypertension. There is also a growing evidence of the influence of female sex hormones on Glaucoma which needs a careful observation. Based on the level of disease, the ophthalmologist should identify appropriate medication including surgery. These changes can be classified in 3 categories.

1. Physiological changes.
2. Pregnancy specific visual disorders.
3. Exacerbations of pre-existing eye diseases.

It has been commonly observed that the attending doctors hardly take serious note of the visual complains and refer them to an ophthalmologist unless or until it grossly affect the vision or as the symptoms worsens. Patient mostly consults the eye specialist at her own. Even the family members take it as a routine happening and do not take a serious note of it.

Normally speaking, most of the symptoms resolve itself during postpartum period but some of the changes need a careful observation and repeated examination with specific treatment i.e. medical or surgical especially in cases of Diabetes, Hypertension, some serious pre-existing eye disease or late-age pregnancies. Lack of proper care and treatment may result in severe debility.

1. Physiological Changes:

i. Adnexal. Presence of Chloasma, a state of increased pigmentation around the eyes , cheeks and neck simulating a butterfly or a spider like pattern is not uncommonly seen in pregnancy. Ptosis is noticed unilaterally related to fluid imbalance or hormonal effect on the levator eponeurosis or stress related changes due to labor and delivery.

ii. Corneal: These are mostly due to water retention causing thickness of curvature and sensitivity of the cornea resulting intolerance to contact lenses and dry eyes.

iii. Glaucoma: development of Krukenberg spindles causing dispersion of pigments and raised IOP. In certain cases patient may develop lowering of IOP due to increased aqueous outflow probably due to shift of Estrogen activity. This has also been observed in the later-age pregnancies and lactating mothers which normally settles during the 3rd trimester. In pre-existing advanced cases, the IOP may drastically increase. Such patients need regular monitoring of IOP, visual fields and treatment. However, it should be kept in mind that all Glaucoma medication get into blood stream of the fetal circulation. In fact, any drug used by mothers into her eye is equally shared by the fetus, this can be excluded by punctal occlusion. Timolol and the Brimonidine are the only drugs of choice with long track record of safety. It must be kept in mind that these drugs may cause respiratory and CNS depression. However, these are free from teratogenicity.

iv. Carbonic Anhydrase Inhibitors can be used but according to one study it has resulted in low birth weight. Prostaglandin analogue, though metabolized quickly, should be avoided as these can induce labor. In fact there is no such drug which is 100% safe in pregnancies. Timolol which is considered relatively safer, must be watched for bradicardia, low BP and respiratory spasm. Beta-blockers have been traced in the breast milk as well. Brimonidine can cause apnea in infants. Latanoprost, in such circumstances could be considered as an ideal drug.

As far as surgery is concerned , it should be avoided in 1st trimester, however, laser trabeculoplasty

can be undertaken. In intractable cases Ahmed's valve or a tube shunt will be successful.

2. Pregnancy-specific Visual Disorders:

i. Eclampsia: Retinal vascular changes are quite visible in 25-39% of the cases. These symptoms tend to get worsen in confirmed vascular disorders. The patient usually complain of blurred vision, photopsia, diplopia and visual field defects. One can also find diffuse ischemic retinal edema, hemorrhages, exudates more look like hypertensive retinopathy. The mechanism involved is the spasm of retinal arterioles brought by the hormonal changes. In more severe cases there could be exudative retinal detachment less than from 1-10% with eclampsia with HELLP syndrome (hemorrhages, elevated liver enzymes and low platelet count). The detachment could be bilateral and tend to resolve during postpartum. This is more common in primiparas. The fluoresceine angiography supports the findings of severe arteriolar spam of the choroidal vessels. Cortical blindness has been observed up to 15% of the patients suffering from eclampsia preceded by severe headache, hyper flexion even paresis. MRI Scan may show the occipital lobe edema and lateral geniculate nuclei. The symptoms usual get reversed but visual field defect may persist for a longer period.

ii. Central serous choriodo-retinopathy has been observed in some cases, where patients complains of central visual defect. At the macula there is an accumulation of sub-retinal fluid leading to neurosensory detachment at the level of RPE. The patient usually complains of metamorphopsia which is due to elevated level of blood-retinal barrier. The changes can be confirmed through OCT. However visual acuity returns to normal after few months.

iii. Occlusive Vascular Disorders: These have been documented in case of amniotic fluid emboli and hypercoagulability resulting in severe visual loss shortly after delivery and rarely associated with Central Retinal Vein/Artery occlusion.

3. Exacerbation of Pre-existing Eye Diseases.

i. Diabetic Retinopathy. It is a major visual complication in pregnancy, particularly if the patient has a pre-existing disease. Gestational diabetes does not seem to increase the symptoms, yet worsening of diabetes in the presence of hypertension, poor glycemic control, eclampsia have been documented. Such patients must be followed for at least one year after delivery. Proper follow up course should be adopted with particular emphasis on the following:

a. Normalization of blood glucose level.
b. Control of high blood pressure.

The standard treatment of DR is laser photocoagulation, though symptoms are likely to regress during postpartum, but it is uncertain and there is every danger of increased risk of progression in terms of visual loss. Such patients should keep vigilant eye on Hypertension, Diabetes and Renal Nephropathy for recurrence of symptoms throughout life. In the long run, if such patient decide to get pregnant again she must be vigorously examined in the first trimester.

ii. Uveitis. Pregnancy seems to have a beneficial effect on non-infective uveitis with a lower incidence of recurrences. This is possibly due to hormonal and immuno-modulatory effects. However, rare flare up has been noticed in the first trimester even after 6 months of postpartum period.

iii. Toxoplasmosis. Latent toxoplasmosis may flare up during pregnancy, but there is hardly any risk of acquiring toxoplasmosis to the fetus.In case of any sign appear Spiramycin is preferred to Pyrimethamine as a safer and equally effective drug in pregnant women.

Following recommendations are suggested:

a. Strict control and medication of Diabetes during and after the pregnancy at least for 3 months .
b. Regular checkup of Blood pressure with medication and restriction of salt intake.
c. Avoiding the use of contact lenses at least during the first trimester.
d. Presence of any symptoms of uveitis.
e. Regular checkup of any increase in IOP.
f. Regular examination of fundus every 3 months, if there are any visual symptoms.
g. Consultation with an ophthalmologist if symptoms persist.

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Dr. Imad Jaradat

ORIGINAL ARTICLE

Practical steps for establishing Ocular Plaque Therapy in Developing Countries

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Abdelatif Al-Mousa MD[4], Ahmed Salem MD[5], Imad Haddadin MD[6], Mustafa Meheyar MD[7], Saamir Kharma MD[3]
Khaleel Rawashdeh MD[3], Iyad Sultan MD[3], Ghadeer Abdeen MD[4], Ibrahim Qaddoumi MD[3], Ibrahim Nawaiseh MD[3]

ABSTRACT

Retinoblastoma and uveal melanoma are the most common ocular tumors in children and adults, respectively. Enucleation and external beam radiation therapy are integral in the management of ocular tumors. However, these tumors could also be treated effectively by plaque therapy, which has the potential of preserving the globe and maintaining vision.

Methods and Materials: We reviewed our experience with the introduction of this technique to our center. Furthermore, we highlighted the critical role of a specialized multidisciplinary team in the successful implementation of this procedure.

Discussion: This review represents a detailed report addressing the practical steps for successfully establishing plaque therapy in developing countries.

Results: Plaque therapy was successfully implemented at our center in 1.5 years. Integration with an advanced cancer center is crucial for the correct transfer of this complex technology.

Conclusion: Complex brachytherapy procedures could be successfully established and implemented in developing countries.

Keywords: Plaque therapy; Retinoblastoma; Brachytherapy; Developing countries

INTRODUCTION

Overall, ocular tumors are extremely rare. Occurrence typically follows a bimodal age pattern. Retinoblastoma (RB) is most common in children with an incidence rate ranging from 3.4 to 42.5 per million in children aged 0-4 years.[1] Ocular melanoma (OM) is most common in adults with an estimated incidence rate of 5.3-10.9 per million population.[2-4] Enucleation and external beam radiation therapy (EBRT) are integral in the management of ocular tumors.[5-8] However, many compelling concerns are associated with these traditional therapeutic modalities. The use of EBRT in children, particularly before 12 months of age, is associated with significantly increased risk of secondary malignancy.[9] As such, current treatment strategies aim at delaying or eliminating the need for such traditional approaches. Radioactive plaque therapy (using iodine-125) involves the placement of a radioactive plaque to the wall of the eye overlying the targeted tumor and could be used as the primary therapeutic modality or an adjunct to surgery. The radiotherapy dose delivered to the tumor apex varies according to the tumor type. In RB, 44 Gy is typically delivered, whereas in OM, 85 Gy is appropriate[10, 11] We aim to present our experience in implementing radioactive plaque therapy in Jordan by reviewing various essential steps necessary for establishing this program from the basic preparatory procedures to final implementation, practice, and quality assurance.

BACKGROUND

The ocular oncology program at King Hussein Cancer Center (KHCC), Amman, Jordan, started to network with advanced ocular oncology centers worldwide and established a special task force to prepare for the implementation of plaque therapy at our center. The team consisted of a staff-grade radiation oncologist, ophthalmologist, adult and pediatric hematologist/oncologist, medical physicist, staff nurse, and a radiation protection officer. The attending radiation oncologist and the medical physicist visited Princess Margaret Hospital (PMH),Toronto, ON.

PRACTICAL STEPS FOR IMPLEMENTATION

The procedure uses Collaborative Ocular Melanoma Study (COMS) gold plaques with 125I. Our radiation oncology department acquired the standard COMS plaques of sizes 10,12,14,16,18 and 20 mm. This would assure our capability of treating tumors less than 10 mm-18 mm in size. The program uses the American Association of Physicists in Medicine task group-43 proto-

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col[17] for dose calculation and the COMS recommendation for parameters. The required equipment and tools that were purchased for the project are listed in Table 1. We have used previously published studies to formulate a local protocol suitable for our institution[10, 11, 18-27]

ASSESSMENT OF TUMOR

Provisional assessment of the tumor by an experienced ophthalmologist is crucial. This includes reference to tumor size, basal diameter, and tumor height as measured by indirect ophthalmoscope and confirmed via standard A and B scan ultrasonography. Furthermore, a detailed fundus diagram with accurate orientation of tumor relative to the surrounding structures, including the optic nerve, foveola, ora serrata, and center of the lens, is required. The input data from the ophthalmologist is used to define the location of the tumor with respect to the macula, optic disc, and lens. This is based on the COMS standard model of the eye and the definitions of the base dimension of tumor toward macula and optic disc as well as the tumor to optic disc and macula distance. Such crucial information is transmitted to the radiation oncologist who in turn selects the appropriate plaque size, prescription dose, and location. The size of the plaque should be 2 mm larger than the tumor in all directions (4 mm more than the largest diameter) (Fig-1)

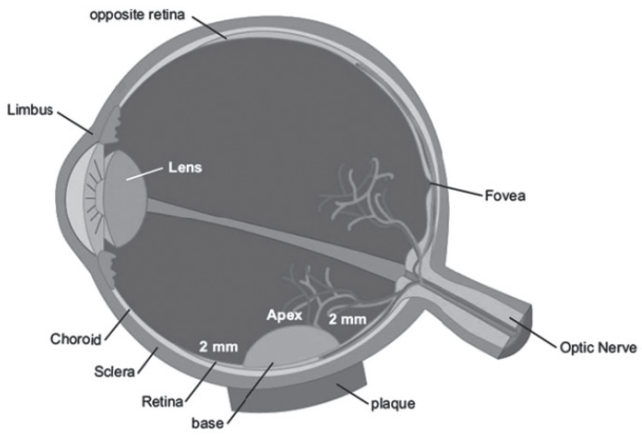

Fig-1: Eye anatomy and how to select the required plaque size

Seed ordering, calculation of required activity, dose rate, and implant time Initially, we ordered the radioactive seeds from a European vendor. However, the order-to-delivery time was 8-10 weeks taking into account local agent response, vendor response, and associated paperwork necessary for exporting radioactive material to the Middle East.

The accuracy of the in-house program was verified during the Princess Margaret Hospital (PMH),visit. Furthermore, the three parameters (tumor location, prescription dose, and required dose rate in cGy/ h, at tumor apex) were fed to three different calculation programs: King Hussein Cancer Center (KHCC), in-house, PMH in-house, and a commercial program. The output was the activity per seed needed to deliver the above data. It should be noted that minor calculation variations normally exists among various programs. At the time of comparison, the PMH and the commercial program used Seed Model 6702, whereas KHCC program used Seed Model 6711.

MATERIAL & METHODS

Preparation of plaque: At the time of arrival, the medical physicist and the radiation protection officer survey the box of seeds for radiation leakage. This is followed by verification of seed activity using a well-type ionization chamber. The seeds are first loaded into the silastic carrier and then into the gold plaque taking into account the direction of seeds with respect to the plaque coordinates. The silastic carrier, gold plaque, and dummy. To enhance integrity, a very small amount of silicone medical adhesive is spaced around the periphery of the plaque to secure the insert. This is done behind a leaded-glass workbench.

Table 1: Necessary equipment for delivering plaque therapy to ocular tumors

1.	Standardized A scan and contact B scan echograph
2.	Standardized set of episcleral COMS plaque with different sizes: 10, 12,14, 16, 18, and 20 mm
3.	RetCam
4.	Radioisotope seeds (125I)
5.	Well chamber from standard imaging, Type HDR 1000 plus, calibrate at the ADCL of the University of Wisconsin (WI, USA) for the seed model used
6.	Electrometer Type Dose 1 from Wellhofere Scanditronix
7.	Survey meter
8.	Eye-patch protector
9.	Super glue long forceps (thin ended)
10.	L- block
11.	Lead eye glasses.

COMS=Collaborative Ocular Melanoma Study; ADCL=Accredited Dosimetry Calibration Laboratory; HDR5high-dose rate; ^{125}I =iodine 125.

The radioactive plaque along with the dummy plaque and a sterilization indicator slip are then placed in a stainless pill box. On the surface of the box, an adhesive radiation sign is fixed that states the patient's name and medical record number, the number of 125I seeds with the activity per seed indicated, and the dose rate in (MSV/h) at 1 m from the exposed plaque. The plaque is then gas sterilized one day before insertion.

DISCUSSION

Reflections from experience: Today, enucleation and EBRTD the historical standard of cared remain

an integral component of the management of patients with RB and OM.[4, 30, 31] However, their roles are gradually fading out secondary to the well-established therapeutic modalities of vision preservation, such a plaque brachytherapy, transpupillary thermotherapy, cryotherapy, and systemic and local chemotherapy[32, 33] The importance of plaque brachytherapy in the treatment of RB and OM is well known[4, 30,] Successful implementation of plaque brachytherapy requires considerable logistical and technical considerations, including appropriate cooperation among a multidisciplinary ocular oncology team, accurate measurement of the tumor dimensions and design, and accurate placement and verification of the radioactive plaque. Minimizing the time between evaluation and treatment is also crucial to ensure that the dimensions of the lesion match the design of the plaque. The seeds have to be imported from abroad; thus, one of our important conditions imposed on the vendor was the time between placement of the order and arrival of seeds, which should not exceed 4 weeks. It should be noted that adequate estimation of the expected time of delivery is crucial for the specification of the required seed activity.

RESULT

We found that the primary prerequisite for the implementation of a successful plaque brachytherapy program is the presence of adequately trained staff. A multidisciplinary team must be organized consisting of an ophthalmologist, pediatric and adult medical oncologists, radiation oncologist, medical physicist, radiation protection officer, staff nurse, and program coordinator. Team members should be well trained in the procedure. Through 1.5 years, we have accumulated the required knowledge and training in plaque brachytherapy using the COMS protocol. Guidelines based on COMS for pre, intra- and post treatments were established. Furthermore, a double-check quality assurance procedure for physics calculations (seed activity and dose to critical structures) and seed calibration has been implemented in cooperation with colleagues in North American institutions. In like manner, clinically orientated multidisciplinary meetings conducted via telemedicine are regularly held by the department of pediatric oncology in conjunction with St. Jude Children's Research Hospital and Sick Children Hospital (Toronto, ON) and the department of radiation oncology in conjunction Lombardi Comprehensive Cancer Center (Washington, DC). Twining programs between KHCC and sister organizations in North America have been previously shown to positively impact survival and therapeutic outcome of RB patients in Jordan.[15] In like manner, these integrations were crucial for the success of this program as they provided access to clinicians and physicists more experienced in this procedure who were regularly consulted in cases of hardships or intriguing questions.

In addition to ocular plaque therapy, Iridium-192 high dose rate intra-cavitary brachytherapy is already available at our center for gynecologic malignancies. Similarly, we are in the process instituting a fully integrated brachytherapy suite and are planning to extend brachytherapy for the treatment of breast and prostate cancers and soft-tissue sarcomas in the near future.

CONCLUSIONS

This review represents a detailed report addressing the steps behind the establishment of plaque therapy in developing countries. Plaque therapy was successfully implemented in our center in 1.5 years. Similarly, complex brachytherapy procedures could, theoretically, be established in other developing countries. Our report would prove useful for ocular oncology teams in developing countries wishing to establish this therapeutic modality. Integration with an advanced cancer center is crucial for the correct transfer of this complex technology. We are glad to provide further detailed information to those interested in implementing plaque therapy in their institutions.

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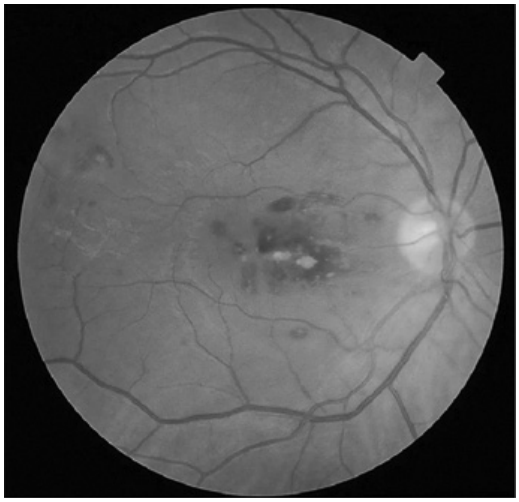

The presence of white-centered hemorrhages (Roth spots) should prompt the consideration of possible infective endocarditis. This patient's diagnosis was confirmed with echocardiography and blood cultures.

D.D.

Myeloma, Syphilis'Systemic lupus erythematosis, Tay-Sachs disease

(Newsnet-online)

Sarfraz Latif

ORIGINAL ARTICLE

Outcome of Endoscopic Dacryocystorhinostomy with Silicon Intubation

Sarfraz Latif FCPS[1], Atif Mansoor Ahmad FCPS, FRCS[2]
Prof. M. Arshad Mahmood FCPS[3], Mohammad Saeed FCPS[4]

ABSTRACT

Purpose: To determine the results of endonasal dacryocystorhinostomy with silicon intubation at Sheikh Zayed Hospital, Lahore.

Material and Motheds: Thirty Patients who underwent endoscopic dacryocystorhinostomy with silicon intubation were included. Data regarding the results was collected and analyzed.

Results: Among the 30 patients there were 43.34% (n=13) males and 56.66% (n=17) females. Their age ranged from 06 to 58 years, mean age was 41.45 ± 8.51 years. The success rate after 1 year of surgery was 92% with few insignificant complications.

Conclusion: Endoscopic dacryocystorhinostomy with silicon intubation is a procedure with minimum complications, no external scar and adequate success rate.

INTRODUCTION

Watering due to nasolacrimal duct obstruction causes much disturbance for the patient. It is generally unilateral and it may presents with symptoms of discharge from the eyes, swelling over the sac area but most commonly with obstructive ephiphora.[1,2] If the condition is not treated the symptoms persist and may predispose to chronic or acute dacryocystitis.[3] Conservative treatment like massage over the sac area does not relieve the symptoms. Syringing and probing also does not help but sometimes causes temporary relief of symptoms in patients with incomplete blockage of nasolacrimal duct. Treatment of nasolacrimal duct obstruction is dacryocystorhinostomy.[1,4,5]

Basic concept of various procedures is to create a fistula between lacrimal sac and nasal cavity for the drainage of tears.[6,8] To get a good surgical success rate modifications in surgical procedure of dacryocystorhinostomy have been introduced.[1] Endoscopic dacryocystorhinostomy is a surgical technique in which a fistula is created from inside the nasal cavity.[8] It can be performed surgically using drill to remove the bone or by laser.[9] This procedure is now routinely done at Sheikh Zayed Hospital, Lahore jointly by the ENT and eye surgeons. In this study we analyzed the outcome of endoscopic DCR.

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MATERIAL AND METHODS

This study was conducted at Department of E.N.T and Ophthalmology, Sheikh Zayed Hospital, Lahore from August 2012 to July 2013 which included the cases of Endoscopic dacryocystorhinostomy with silicon intubation for obstructive epiphora due to nasolacrimal duct obstruction.

A complete ocular history and examination was done including examination of lids and adnexa. Regurgitation test and probing and syringing was done in every patient. Examination of nasal cavities was done for any nasal pathology especially mucosal disease, hypertrophied middle turbinate, nasal polyp, deviated nasal septum and anatomical variations of lacrimal sac that may produce difficulty during endonasal surgery. Systemic diseases especially hypertension and diabetes were evaluated. All patients were explained about the endoscopic dacryocystorhinostomy and a written consent from the patients was then taken for the procedure.

Inclusion criteria: Obstructive epiphora due to nasolacrimal duct obstruction and chronic dacryocystitis.

Exclusion criteria:

- Upper nasolacrimal system (punctum and canaliculi) obstruction, atresia or absence and eversion.
- Lacrimal sac sinus formation
- Previous nasolacrimal surgery
- Traumatic or congenital nasal bony deformity

Surgical technique: All surgeries were performed by a team of same Ophthalmologist and Otorhinologist under general anesthesia. Nose of the affected side was packed with 2% xylocaine with adrenaline solution, 10 minutes before starting the surgery. Both upper and

lower punctum were dilated and lacrimal sac was distended with normal saline. Nasal packing was removed and nasal cavity was entered with 4mm 0^0 Hopkin Karl Storz rigid nasal endoscope attached to an endoscopic video camera (Stryker endoscopy system). Exact location and size of the lacrimal sac was marked. After incision on the marked nasal mucosa the periosteum was then elevated from the bone with the periosteum elevator and 1.5x1.5 cm of the nasal mucosa overlying lacrimal sac was removed with up biting Balaesky forceps. Using the Kerrison rounguer the bone forming the lacrimal crest was nibbled and removed. The opening was then enlarged using the same rounguer. Bony ostium was enlarged to an extent of approximately 1.5 x 1.5 cm, bone overlying the upper part of nasolacrimal duct was also removed. Lacrimal probes were passed from upper and lower punta, canaliculi into the lacrimal sac. Elevating (tenting) the nasal mucosa with lacrimal probes, a vertical incision was made with phaco knife 15 avoiding injury to nasal mucosa to minimize the hemorrhage. Lacrimal probes were visible in that opening. Nasal mucosa and medial wall of the sac was removed up to the upper part of nasolacrimal duct. After adequate hemostasis and sufficient opening in the sac silicon stents were passed through the upper nasolacrimal system, lacrimal sac and newly created fistula and then free ends were secured in nasal cavity with 4/0 silk, figure 1. Small nasal packing was done at the end of surgery and was removed after 24 hours. Postoperatively systemic antibiotic and analgesic were given for 05 days. Antibiotic (Moxifloxacin) eye drops for 04 weeks, nasal decongestant spray for the initial period and saline drops inside the nasal cavity to prevent crust formation were given. Patients were followed up regularly at week 1, week 4, 3 months and 6 months. Postoperatively patient's symptoms were evaluated and endoscopic examination of nasal cavity performed on each visit with Karl Storz flexible endoscope to evaluate the healing process, size, shape and patency of the DCR opening. The silicon stents were removed after 8-12 weeks postoperatively.

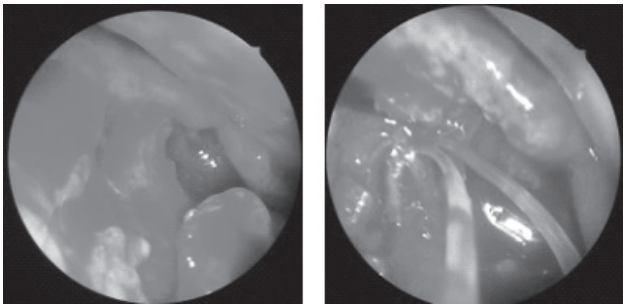

Figure 1: Opening of lacrimal sac and silicon tubes in nasal cavity after passing from upper nasolacrimal system

RESULTS

Endoscopic endonasal DCR without intubation was performed in 30 patients under general anesthesia. There were 43.34% (n=13) were males and 56.66% (n=17) females. Patients age ranged from 6 to 58 years. Mean age was 41.54 ±8.51 years. Complete relief from epiphora was observed in 92% (n=26). No significant intraoperative complication was observed in any one of these cases. Post operatively mild eyelid edema in five patients and mild nasal bleeding in four patients was observed and managed conservatively. 8% (n=4) had procedure failure. In two patients cause of procedure failure was granuloma formation at the site of fistula, one patient had fibrosis at the site of bony opening and one patient had hypertrophied middle turbinate. Failed endoscopic DCR patients underwent dacryocystography post-operatively which showed blockage of new fistula.

Three patients had repeat endoscopic surgery with excision of granuloma tissue and fibrous adhesions and silicone tube insertion. Opening was cleared by removing clot and debris and advised instillation of normal saline drops post-operatively. One patient with middle turbinate hypertrophy had history of chronic allergic rhinitis, he was managed conservatively.

DISCUSSION

External dacryocystorhinostomy is a gold standard traditional surgical approach to treat nasolacrimal duct obstruction.[3,7] Success rate of other techniques is measured and compared with this method.[3] Most Ophthalmologists believes that external dacryocystorhinostomy provides highest success rate as compared to other techniques.[7]

Endoscopic dacryocystorhinostomy have many advantages compared to external dacryocystorhinostomy such as no skin incision, minimum tissue injury which is limited to the fistula site, short hospital stay, rapid rehabilitation and patient's preference.[2,8,9,11,12]

Interanasal dacryocystorhinostomy was first described by Caldwell in1893.[5,6,8,9] McDonogh and Meiring introduced endoscopic trans-nasal dacryocystorhinostomy in 1989 as cited by Tan NC et al 2009 and Mortimore S et al 1999.[5,6] Intranasal technique remained limited at that time due to poor visibility of intranasal anatomy. This technique gained popularity after introduction of high resolution fiber-optic endoscopes and rigid endoscopes with different degrees of angulations.[10]

Endonasal technique requires time to acquire expertise of using endoscope, i.e. steep learning curve and high equipment cost.[11] Proper pre-operative examination of nasal cavity is important for patient selection for

this procedure. Nasal septum deviation causing narrow nasal cavity at the neo-ostium, connective tissue disorder, sarcoidosis, chronic sinus disease, mucocele, previous external dacryocystorhinostomy or other nasal surgery are the pre-operative risk factors.[11] Severe nasal deformity and scarring of nasal mucosa are the basic contra-indication for endonasal dacryocysto-rhinostomy.[11]

In this study complete relief from epiphora was observed in 92% (n=26). Success rate of our study is comparable to others.[1,5,10,13,14] Success rate of endonasal endoscopic DCR in other studies are as follows, Zaman M and colleagues[1] reported 95% success rate, Tan NC and colleagues[5] reported 95% success rate, Kakar V and colleagues[10] reported 90% success rate, Yung MW and colleagues[14] achieved 93% success rate. Massegur H and colleagues[13] reported 92.7% success rate.

Only eight percent (n=4) had procedure failure, one patient had granuloma formation at the site of bony opening, two patients had fibrosis and one patient had hypertrophied middle turbinate. Similarly Ressionitis etal[11] found obstruction of neo-ostium by granulation tissue or fibrosis as the most common cause of failure. Adhesion may also form between the flaps of nasal mucosa, flaps of lacrimal sac and sometimes between the nasal mucosa at the margins of ostium and nasal septum if there is damage to the nasal mucosa covering the nasal septum.[11]

No significant intra operative complications were observed in our study. In the literature, bleeding from the nasal cavity occurs if there is extensive damage to the lacrimal sac mucosa or mucosa of the nasal septum,[7,10] Orbital injury, especially when too much of the soft tissue is removed while removing the medial wall of the lacrimal sac,[7] recurrent infection if the bone covering the lower part of lacrimal sac is not removed completely[7] are the complications of endonasal DCR.

Post-operative outcomes like relief of the symptoms of epiphora, patency of ostium opening into the lacrimal sac and positive Jone's dye test are indicators of successful surgery.[6,11] By and large endoscopic DCR with stent is an effective and safe method to treat nasolacrimal duct obstruction.

CONCLUSIONS

Endoscopic DCR with silicon intubation is considered as safe, well tolerated and effective primary procedure for the treatment of nasolacrimal duct obstruction with fewer complications and a good alternative to external DCR with encouraging success rate.

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Shabana Chaudhry

ORIGINAL ARTICLE

Treatment of Periocular Infantile Hemangiomas with Oral Propranolol

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ABSTRACT

Purpose: To determine the efficacy and safety of early treatment with propranolol in infants aged less than 6 months affected by periocular infantile hemangioma.

Design: Prospective interventional case series.

Patients and Methods: Nine infants, 3 to 4 months of age, with periocular capillary hemangiomas with occlusion of the pupil, anisometropic astigmatism or proliferating eyelid infantile hemangioma (IH) and proptosis were treated with oral propranolol (Inderal, 20mg/5ml) 2.0 mg/kg per day divided in 2 doses. Propranolol was continued up to 1-6 months and tapered over 2-3 weeks. All infants were followed for 6- 8 months. Lesion size and evolution were assessed during the follow-up period with serial photographs before, during, and after treatment. Magnetic resonance imaging was performed pre- and post-treatment when possible.

Main Outcome Measures: Evolution of the treated infantile hemangioma was evaluated with respect to astigmatism and size of the lesion.

Results: Significant improvement was noted in 7/9 patients in the first 2 months of therapy with slow and continuous effect throughout the follow-up period. No serious complications were observed.

Conclusions: Propranolol was found to be an effective modality of treatment for periocular IH. It appears to be a most efficacious when initiated in the proliferative phase of IH.

Keywords: Oral Propranolol, Capillary Hemangioma, infantile haemangioma (IH)

INTRODUCTION

Capillary haemangioma or infantile haemangioma (IH) is the most common congenital vascular tumour of the periorbital region[1] and accounts for 8%-10% of benign paediatric tumors.[2] About 80% of haemangiomas are located in the head and neck regions.[3] Up to 43% to 60% of patients with periocular IH can develop amblyopia when either eyelid or orbit is affected[4]. This is as a result of astigmatism or mechanical ptosis causing visual deprivation.[5,6]

Although the natural history of an IH is a spontaneous regression during the first decade of life, a high proportion of children with periocular IH will need treatment.[7] Ocular indications for treatment include obstruction of visual axis by the haemangioma or high degrees of astigmatism causing amblyopia,[8] exposure keratopathy secondary to proptosis, compressive optic neuropathy or rarely bleeding from the lesion.[7] Several treatment modalities have been documented, with variable degree of success. Those include intralesional, topical, or systemic corticosteroids as a first line of treatment. Local injection of corticosteroids is the most common route of administration; however it is associated with serious adverse effects such as occlusion of the ophthalmic artery or central retinal vein, retinal embolization, adrenal suppression and hypopigmentation at the site of injection. Topical application of corticosteroids has been used for superficial lesions only.[9]

Other modalities of treatment include interferon alpha, vincristine, cyclophosphamide, topical imiquimod, focal laser photocoagulation, and surgical excision.[4,9-11] Léauté-Labrèze et al[12] recently observed serendipitously that propranolol (a nonselective [beta]-blocker) can inhibit the growth of IH. When two infants with severe complicated hemangiomas who were treated with corticosteroids for the hemangiomas also were treated with propranolol--a nonselective [beta]-blocker--for other medical indications. Both experienced rapid improvements in the problematic hemangiomas

There are limited studies on the duration, long-term effects and complications of propranolol therapy for capillary hemangiomas and to the best of our knowledge; propranolol is a relatively safe drug for use in young patients.[4, 12-22]

The purpose of this study was to determine the efficacy and safety of early treatment with propranolol in infants aged less than 6 months affected by periocular infantile hemangioma.

PATIENTS AND METHODS

The study was carried out at Children's Hospital & Institute of Child Health, Lahore (CH & ICH) from Oct, 2009 to Sept, 2010. We describe nine infants be-

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tween the age of 1month to 6-months with congenital capillary hemangiomas who received treatment for the period of 2-6months. The study was approved by the Ethics Committee of the CH& ICH. Informed consent was obtained from the patients' guardians prior to the study. All patients were admitted in medical unit and monitored for 3 days, and underwent a complete baseline ophthalmic examination. All cases underwent systemic examination, laboratory investigation and baseline echocardiography by a pediatric cardiologist.

Inclusion Criteria: Age of 1-6 months, periocular capillary hemangiomas with occlusion of the pupil, anisometropic astigmatism or proliferating eyelid IH and proptosis.

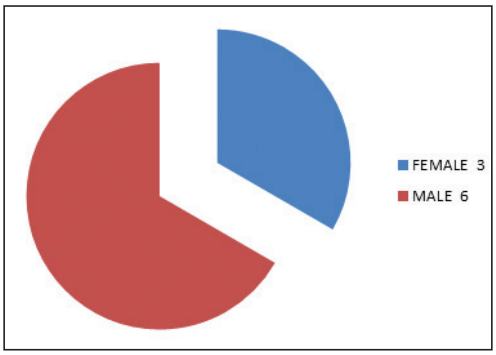
Exclusion Criteria: Infants with systemic/cardiac involvement or those who had conventional treatment with systemic steroids primarily.

Dose: Treatment was initiated at a dose of 1mg/kg/day propranolol hydrochloride(**Inderal**- 20mg/5ml) on the first day; (we made powder of the available tablet form of the drug and mixed with honey) if vital signs and blood sugar were stable the dose was doubled on the following day. The maintenance dose was 2mg/kg/day divided in two doses. They were followed twice a week for 2 months and then monthly for 6- months. Pre/post treatment MRI was possible only in one patient.

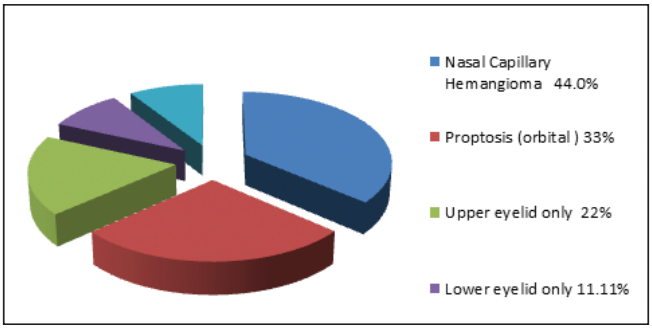
Ophthalmologic Examination: The ophthalmologic examination of the patients with periocular IH was performed with particular emphasis on establishing the presence or absence of occlusion of the visual axis, the position of the lower and upper eyelid relative to the pupillary border, and the presence of proptosis or displacement of the eye in any direction. A thorough orthoptic examination and a cycloplegic refraction were also performed. Anisometropic astigmatism was defined as 1.5 diopters (D) or more of astigmatism difference between both eyes, significant enough to produce anisometropic amblyopia.[23] The astigmatic difference between the 2 eyes was calculated by subtracting the amount of cylinder in the affected eye (the side with IH) from the amount of cylinder in the normal eye (the side without the IH). Threat of occlusion of the pupil was defined as upper or lower eyelid margin within 1 to 2 mm of the papillary border in ambient light in the presence of a rapidly growing IH over the course of several weeks. Lesion size and evolution were assessed during the follow-up period with serial photographs before, during, and after treatment by two independent Ophthalmologists.

RESULTS

Oral Propanolol was given as a first line management in the patients between 1-month to 6-monhts of age (mean age=3-months).6-males and 3-females patients were included in the study (Graph-1). Ocular findings in all nine patients were present. 6/9 patients (66.6%) presented with partial/complete ptosis and eyelid fissure closure. Significant astigmatism was noticed in 4/9 (44.4%), (astigmatism ranges from 1.75D to 2.50D) and 3/9 (33.3%) of the patients were also having proptosis. (Fig-1a and 2a). One patient (1/9) had corneal haze and high IOP and another patient had mild tortuosity of fundal vessels and fullness of disc on fundus examination on the side of capillary hemangioma.(Table-1).



Graph-1



Graph-2: Site Of Hemangioma

Tab-1: Ocular & Systemic Features

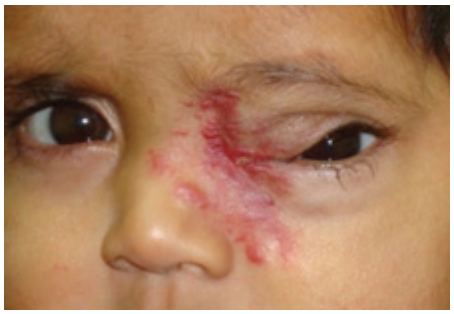
OCULAR & SYSTEMIC FEATURES	
PTOSIS (COVERING PUPILLARY AXIS)	5/9 (55.5%)
PROPTOSIS	3/9 (33.3%)
LOWER LID INVOLVEMENT CAUSING INVERSE PTOSIS	2/9 (22.2%)
ASTIGMATISM	4/9 (44.4%)
HIGH IOP	1/9 (11.1%) (PATIENT WITH PROPTOSIS)
ANTERIOR SEGMENT FINDINGS	1/9 (11.1%) (CORNEAL HAZE)
FUNDUS	1/9 (11.1%) (MILD TOURTOUS VESSELS & DISC FULLNESS)
SKIN LESIONS ON OTHER SITES	2/9 (22.2%) (RETROAURICLE & LOWERLIMB)

In four of the patients the site of involvement with capillary hemangioma was upper lid (nasal side) or lower lid and orbit (Fig 1a and 2a). One patient had hemifacial involvement with lateral half of both upper and lower lids.(Fig 3a). 1/9 (11.1%) of the patients showed periauricular hemangioma (Fig-4) and one patient had cutaneous hemangioma of lower limb. (Fig-5). Periocular site distribution is summarized in (Graph-2). Perinatal history was unremarkable and no gross systemic involvement was present.

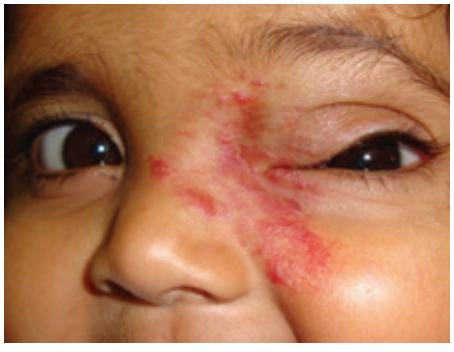
Within 72-hours of propranolol administration, the colour change in hemangioma was noticed in 4/9 (44.4%) patients (Fig 1-b). Two weeks after treatment the lesions regressed by 40% (Fig 2b) and 5/9 (55.5%) of the patients were able to open their eyes(Fig 3a and 3b). By the end of the second month, the lesions had been reduced to one-third of their original size in 6/9 (66.6%) patients with significant decrease in anisometropic astigmatism in all 4/9 (44.4%) patients.The mean value of such error decreased to 0.75D. Adjunct oral steroids were started in one (1/9) patient after 6-weeks of slow improvement.

Propranolol was continued in 7/9 children for 6 months after which it were discontinued gradually. No further benefit was observed during first 4-weeks of treatment in 2/9 patients (22.2%) and non-compliance of follow-ups, propranolol was tapered over 2-3 weeks by the parents. No ocular or systemic complications of the treatment was noticed.

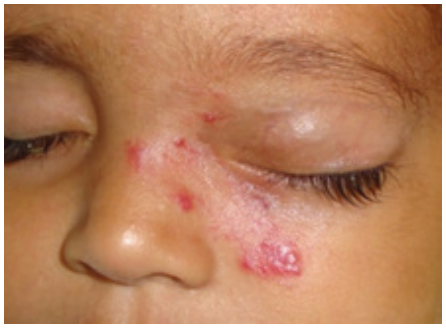
Case 1



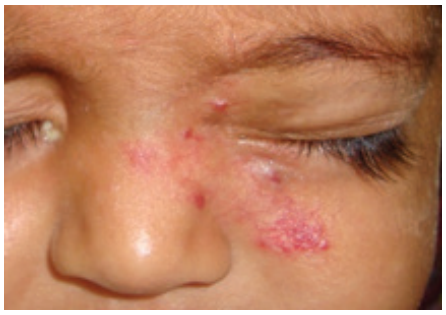
Pre-Treatment (Fig 1-A)



After 72 Hours

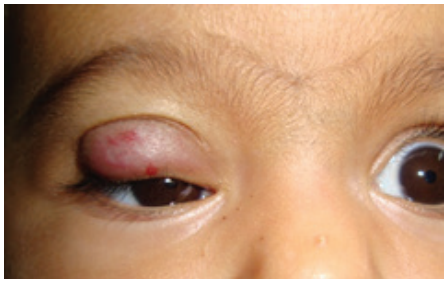


After 4-Weeks (Fig1-C)

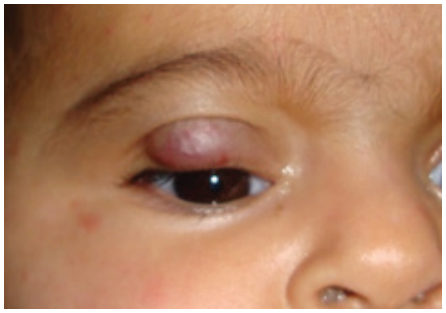


After 8 Weeks (Fig1-D)

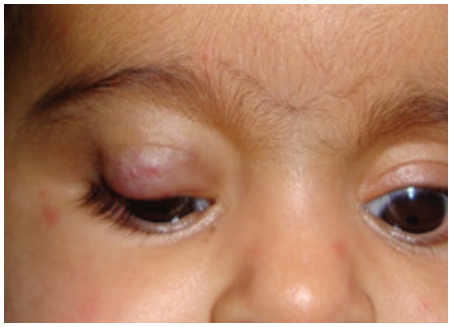
Case 2



Pre Treatment (Fig2-A)

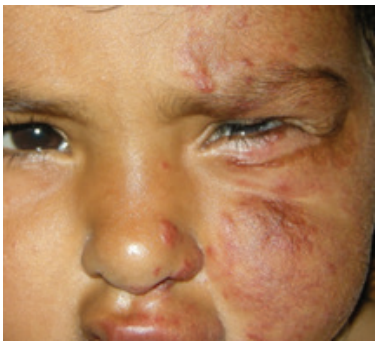


After 3-Days (Fig 2-B)

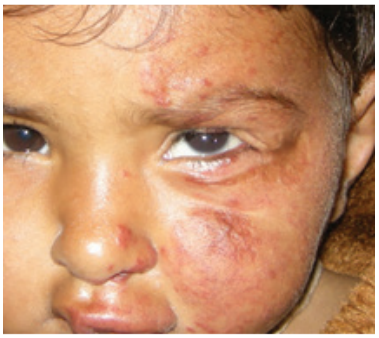


After 8-Weeks (Fig 2-C)

CASE 3



Pre-treatment (FIG 3-A)



After 8-Weeks (Fig3-B)

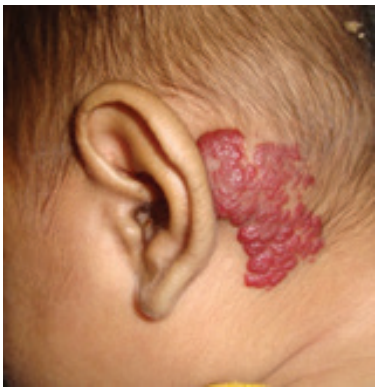


Fig-4

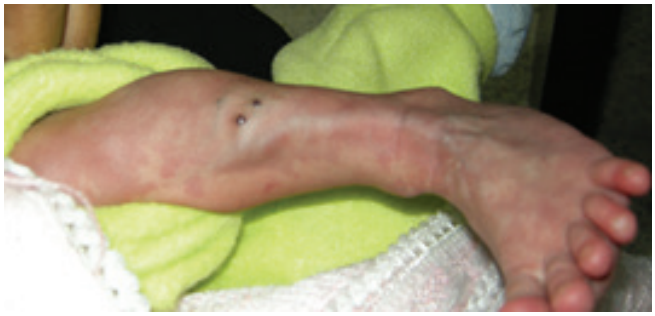


Fig-5

DISCUSSION

Capillary hemangiomas are common childhood tumors reaching their maximum growth in the first year of life[2,9,10,13,24] with a female predilection (3:2 ratio).[25] Complete spontaneous regression of the tumor occurs in 32-60% of patients by the age of four and in 72-76% by the age of seven years. Due to this long period for spontaneous resolution, there is a possibility of amblyopia due to axial myopia secondary to ptosis or astigmatism in which the positive axis lies parallel to the mass. Amblyopia occurs in 44-64% of cases due to anisometropia or visual deprivation.[18-21]

There are some reports on the dramatic effect of oral propranolol on the size and volume of vascular masses.[4, 12-22] Similarly we observed this effect in 4 of the 9 patients (44.4%). Though Léauté-Labrèze et al observed a change in the haemangioma from intense red to purple colour; this change was associated with a palpable softening of the lesion in first 24-hours in all patients, we found the first visible and measurable response to treatment in 72- hours of initiating treatment and only in 44.4% (4/9) of the cases. Lesion size decreased to half of its original size after 6-weeks in 55.5% (5/9) of the patients (photographic assessment). This rapid response, as compared to corticosteroid-based treatments[21] is especially valuable in terms of preventing amblyopia.

Infantile capillary haemangiomas are composed of a complex mixture of clonal endothelial cells associated with pericytes, dendritic cells, and mast cells. Regulators of haemangioma growth and involution are poorly understood. During the growth phase, two major pro-angiogenic factors are involved: basic fibroblast growth factor (bFGF) and vascular endothelial growth factor (VEGF); histologic studies have shown that both endothelial and interstitial cells are actively dividing in this phase. During the involution phase, apoptosis has been shown.[24,25] Potential explanations for the therapeutic effect of propranolol—a non-selective beta-blocker-on infantile capillary haemangiomas include vasoconstriction, which is immediately visible as a change in colour, associated with a palpable softening of the haemangioma; and reduction of the expression of genes for vascular endothelial growth factor, basic fibroblast growth factor and matrix metalloproteinase[26] (which explains the progressive improvement of the haemangioma); and the triggering of apoptosis of capillary endothelial cells.[24,27]

The most common cause of amblyopia associated with periocular IH is astigmatism induced by the distortion of the cornea.[28] Rola Al Dhaybi et al[8] noticed in 71% of the patients, decreases in astigmatism to non-amblyogenic level after treatment. Similarly in 3/4(75%) of our patients with astigmatism average 35% reduction was noticed in astigmatism (non amblyiogenic range) within 2-months of treatment.

Bradycardia and hypotension are the most common side effects of propranolol.[12,13] Propranolol induced hypoglycaemia or the masking of its symptoms are particularly important in children; these may be easily diagnosed and treated by employing the precautionary measures.[12-16] History of prematurity, age less than 3 months, comorbidities, and asthma are factors associated with a higher risk of side effects.[24] Wheezing[4] and hyperkalemia[22] have also been reported. In our case series the patients were under close observation by paediatrician and cardiologist. During the follow-up period and after discontinuation of treatment we observed no complications or tumour regrowth (7/9). It may be because we included in study the patients with ocular involvement only and short follow-up. Detailed literature research also showed one case report from Pakistan with promising outcome of capillary haemangioma with propranolol.[29]

Though our study had small number of patients, based on the good results and a low risk profile, we recommend propranolol as a safe and effective first line therapy for periorbital capillary haemangiomas in children where ocular morbidity is crucial. Child should be under close observation of the paediatrician/cardiologist for first few days of starting the treatment. A randomized clinical trial could enrich the existing knowledge and improve the management of periocular and orbital haemangiomas.

CONCLUSION

Propranolol was found to be an effective modality of treatment for periocular IH. It appears to be a most efficacious when initiated in the first few months of life.

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Mubashir Rehman

ORIGINAL ARTICLE

Effectiveness of Ketorolac Tromethamine in reducing Post-operative Inflammation after Phacoemulsification and Intra-ocular Lens Implantation

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ABSTRACT:

Objective: To determine the efficacy of Ketorolac tromethamine in reducing postoperative inflammation after phacoemulsification and intra-ocular lens implantation in terms of grades of anterior chamber cells and grades of aqueous flare.

Study design: It was a descriptive cross sectional study.

Place and duration of study: The study was conducted at Eye "B" Unit Khyber Teaching Hospital Peshawar from March 2009 to March 2010.

Patients and methods: This study was carried out on 59 patients. An informed consent was obtained from all patients for including the patients in this study and using their data in the study. Examination included detailed anterior segment examination with slit lamp and fundus examination. All cases underwent phacoemulsification with intraocular lens implantation by same surgeon. Next morning grades of AC cells and grades of aqueous flare were examined on slit lamp biomicroscopy with a 2 mm long and 1 mm wide slit beam with maximal light intensity. Patient were started on Ketorolac tromethamine (0.5%) eye drops four times per day along with Tobramycin (0.3 %) eye drops four times per day. Follow up was at 7th and 30th postoperative days and at each visit grades of AC cells and grades of aqueous flare were examined on slit lamp biomicroscopy with same parameters as on 1st postoperative day.

Results: The mean age was 62.50 ± 5.51 years. The male to female ratio was 1.26:1. On first post-operative day before starting the topical drops, majority of the patients had moderate degree of inflammation in the anterior chamber. Flare in the anterior chamber was faint in a few cases. On 7th postoperative day inflammation in the anterior chamber was much reduced. On 30th postoperative day inflammation was greatly reduced, only 11 patients had 1-5 cells in the anterior chamber, while the remaining had less than 1 cell. Flare got resolved in all cases.

Conclusion: Ketorolac tromethamine is effective for control of postoperative inflammation after phacoemulsification with intra-ocular lens implantation. We recommend the use of Ketorolac Tromethamine after phacoemulsification surgery.

INTRODUCTION

Cataract is defined as any congenital or acquired opacity in the lens capsule or substance, irrespective of the effect on vision.[1] Cataract is the world's leading cause of avoidable blindness affecting an estimate of 20 million people.[2] Cataract surgery is the most common refractive surgical procedure performed on aging individuals.[3]

The corticosteroids, which are considered the gold standard for the treatment of post-operative ocular inflammation, are associated with an increased incidence of adverse events that warrant their judicious use.[4] These adverse events include cataract formation, a rise in IOP, increased susceptibility to microbial infections due to a suppressed host immune response and retardation in corneal epithelial and stromal wound healing.[5]

Cataract surgeons have therefore been interested in alternative treatments for postoperative pain and inflammation with effectiveness equivalent to steroids but with fewer complications. A safer alternative to corticosteroids for the treatment of ocular inflammation are the NSAIDs. NSAIDs comprise several chemically heterogeneous classes of drugs which possess potent COX inhibitory activity.

Surgical trauma causes a trigger of the arachidonic acid cascade which in turn generates prostaglandins (PG) by activation of cyclooxygenase 1 (COX-1) and cyclooxygenase 2 (COX-2). Phospholipids in the cell membrane are the substrate for phospholipase A to generate arachidonic acid from which a family of chemically distinct prostaglandins and leukotrienes are produced. Prostaglandins cause vasodilation and increase the vascular permeability resulting in increased aqueous humour concentration.[6]

Prostaglandin synthesis can be reduced by inhibiting phospholipase A_2, which inhibits the release of arachidonic acid from cell membrane phospholipids, or by inhibiting the conversion of arachidonic acid to prostaglandins via the COX pathway. Different classes of anti-inflammatory medications may block different

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portions of this pathway.

Non-steroidal anti-inflammatory drugs (NSAIDs) nonspecifically and irreversibly inhibit the synthesis of prostaglandins by interfering with the activity of COX-1 and COX-2. COX-1 is responsible for the production of prostaglandin G2 (PGG_2), which is important for homeostatic functions, such as maintaining the integrity of the gastrointestinal mucosa, mediating platelet function, and regulating renal blood flow.[7] The expression of COX-2 occurs in response to the exposure to a noxious stimulus. It has been demonstrated that COX-2 is the primary mediator for ocular inflammation.[8] Therefore, inhibition of COX-2 is thought to be the most important therapeutic mechanism of ophthalmic NSAIDs.

Studies comparing NSAIDs with corticosteroids have demonstrated no significant difference in the results between these treatments.[9, 10, 11] Also NSAID treatment appears to be more effective than topical corticosteroids in re-establishing the blood–aqueous barrier.[12] The beneficial effects of NSAIDs over corticosteroids include stabilization of IOP, provision of analgesia and reduction of the risk of secondary infections.[13, 14]

Ketorolac tromethamine 0.4% was introduced in the United States in 2003.[11] It is a member of the pyrrolo-pyrrole group of NSAIDs used in ophthalmology. It provides good control of intraocular inflammation after cataract extraction without the risk of IOP increase.[15] It is safe and effective for topical use after cataract surgery.[16-17]

Purpose of our study was to find out Ketorolac tromethamine as an effective drug for reducing postoperative inflammation after phacoemulsification and intraocular lens implantation.

Study design: It was a descriptive cross sectional study.

METHODS

This study was carried out on 59 patients who had undergone phacoemulsification surgery with intraocular lens implantation by same surgeon at Eye "B" Unit KTH Peshawar from March 2009 to March 2010. An informed consent was obtained from all patients for including the patients in this study and using their data in the study. Examination included detailed anterior segment examination with slit lamp and fundus examination.

Postoperatively all patients were kept admitted in ward with pad on operative eye. Next morning pad was removed under aseptic measures and complete postoperative examination carried out. Grades of AC cells and grades of aqueous flare were examined on slit lamp biomicroscopy with a 2 mm long and 1 mm wide slit beam with maximal light intensity. Patient were started on Ketorolac tromethamine (0.5%) eye drops four times a day and Tobramycin (0.3 %) eye drops four times a day.

Follow up was at 7th and 30th postoperative days and at each visit grades of AC cells and grades of aqueous flare were examined on slit lamp biomicroscopy with same parameters as on 1st postoperative day. All the statistical analysis was carried out using software SPSS 10.0. Quantitative variable was age. Qualitative variables were gender, grades of AC cells, and grades of aqueous flare. Descriptive statistics like mean, standard deviation and maximum and minimum values had calculated for quantitative variable and descriptive statistics like percentage had calculated for qualitative variables.

Operational definitions

Postoperative inflammation: Intraocular inflammation that occurs due to tissue damage during surgery and is measured in terms of grades of AC cells and grades of aqueous flare on slit lamp biomicroscopy with a 2 mm long and 1 mm wide slit beam with maximal light intensity.

Grades of AC Cells and Grades of Aqueous flare

GRADES OF AC CELLS		GRADES OF AQUEOUS FLARE	
GRADE	CELLS IN FIELD	GRADE	DESCRIPTION
0	< 1	0	NIL
0.5 +	1 – 5	1 +	FAINT
1 +	6 – 15	2 +	MODERATE (Iris and lens detail clear)
2 +	16 – 25	3 +	MARKED (Iris and lens detail hazy)
3 +	26 – 50	4 +	SEVER (Fibrinous exudate)
4 +	> 50		

Effectiveness: Effectiveness is defined as improvement of inflammation with either a two-step decrease in the level of activity in the anterior chamber or a decrease to inactive level.

RESULTS

There were total 59 patients. The mean age was 62.50 ± 5.51 years. Age distribution is shown in table I. The male to female ratio was 1.26: 1 with 26 males and 33 females. No patient was withdrawn from the study. On first post-operative day before starting the topical drops, majority of the patients had moderate degree of inflammation in the anterior chamber. Out of 59 patients, 56 patients have 16-25 cells in the anterior chamber as shown in table II. Flare in the anterior chamber was faint in a few cases as shown in the table II.

On 7th postoperative day inflammation in the anterior chamber was much reduced. Out of 59 patients, 50

patients have 6-15 cells and 9 patients have 16-25 cells in the anterior chamber (table III). 9 patients out of 59 patients have faint flare on 7th postoperative day (table III). On 30th postoperative day inflammation was greatly reduced, only 11 patients had 1-5 cells in the anterior chamber, while the remaining had less than 1 cell (table IV). Flare got resolved in all cases. These results showed that postoperative inflammation was reduced markedly after using topical drops for one month.

Table-I: Age distribution

	Age in years					Total
	50 - 55	56- 60	61 - 65	66 - 70	71 - 75	
No of patients	16	12	12	17	2	59

Table-II: Cells and flare in anterior chamber on 1st post-operative day

Cells in anterior chamber	16-25 Cells	26-50 Cells	Total
No of patients Percentage (%)	56 94.91%	35 5.08%	59 100%
Flare	**Nil**	**Faint**	**Total**
No of patients Percentage (%)	56 94.91%	3 5.08%	59 100%

Table-III: Cells and flare in anterior chamber on 7th post-operative day

Cells in anterior hamber	6-15 Cells	16-25 Cells	Total
No of patients Percentage (%)	50 84.74%	9 15.25%	59 100%
Flare	**Nil**	**Faint**	**Total**
No of patients Percentage (%)	50 84.74%	9 15.25%	59 100%

Table-VI: Cells in anterior chamber on 30th post-operative day

Cells	Less than 1 Cell	1-5 Cells	Total
No of patients Percentage (%)	48 81.35%	11 18.64%	59 100%

DISCUSSION

Cataract surgery always causes a certain degree of post-surgical ocular inflammation.[7] Recent advances in surgical techniques, surgical tools and intraocular lens (IOL) engineering have reduced the amount of inflammation after cataract extraction. [18.]

Inflammation of the anterior chamber of the eye is usually treated with eye drops containing a combination of anti-inflammatory and anti-infective drugs.[19] Although inflammation after phacoemulsification is usually self-limited the aim of anti-inflammatory therapy is to reduce intraocular inflammation as it can prolong patient recovery, raise intraocular pressure (IOP), and increase the likelihood of cystoid macular edema (CME), synechial formation, posterior capsule opacification (PCO), and secondary glaucoma.[20]

Steroidal ophthalmic solutions are routinely administered for approximately 1 month after uneventful cataract surgery in order to reduce an inflammatory reaction. From the perspective of infection prophylaxis, however, postoperative steroidal ophthalmic solutions might be best avoided after internal ocular surgery because these drugs have a nonspecific immunosuppressive effect; also these drugs may induce a secondary glaucoma and delay epithelial wound healing.[21]

Topical non-steroidal anti-inflammatory drugs (NSAIDs) secured an important role in the treatment of ocular inflammatory disease. NSAIDs act primarily through the inhibition of the cyclooxygenase (COX) enzyme isoforms. Interestingly, NSAIDs also have been demonstrated to exert anti-inflammatory activity by mechanisms unrelated to COX inhibition through suppression of polymorphonuclear (PMN) locomotion and chemotaxis as well as by decreasing expression of inflammatory cytokines and mast cell degranulation.[22] Topical non-steroidal anti-inflammatory drugs, offer comparable efficacy to corticosteroids in the reduction of postoperative inflammation and offer lower risks of adverse events.[23]

In our study we used Ketorolac tromethamine an NSAID in the treatment of postoperative inflammation after phacoemulsification in otherwise normal eyes and found that Ketorolac tromethamine was effective. The efficacy variables of our study included signs of the anterior segment inflammation, primarily cells and flare in the anterior chamber as observed by slit lamp biomicroscopy. Significant control of anterior segment inflammation in the form of cells and flare on 30th post operative day was found, which is comparable to the study conducted by Ostrov CS et al[24] and Flach AJ and his coworkers.[25]

Our study included 59 patients. All the patients were above 50 years of age and had senile cataract. The mean age was 62.50 ± 5.51 years. There were 33 males and 26 females.

All the cases underwent uneventful phacoemulsification by same surgeon and majority of them had equal degree of inflammation on 1st postoperative day before starting the topical eye drops. 56 (94.91%) patients had moderate degree of inflammation i.e. 16 – 25 cells in the anterior chamber. The remainder had severe inflammation i.e. 26 – 50 cells. Regarding flare, 3 (5.08%) patients had faint degree of flare in the anterior chamber on 1st postoperative day; the remainder had nil degree of flare.

On 7th postoperative day inflammation was much

reduced. 50 (84.74%) patients had 6 – 15 cells in the anterior chamber while 9(15.25%) patients had 1 – 5 cells. Regarding flare, 9 (15.25%) patients had faint degree of flare in the anterior chamber; the remainder had nil degree of flare.

The final analysis had made on 30th postoperative day. Majority of cases had only mild degree of inflammation i.e. 48 (81.35%) patients had less than 1 cells while 11 (18.64%) had 1–5 cells. Flare got resolved in all the cases. These results showed that Ketorolac tromethamine 0.5% is effective in the control of postoperative inflammation after phacoemulsification. These results are comparable to the study conducted by Ostrov CS and his colleagues.[24]

In our study we measured flare in the anterior chamber on slit lamp biomicroscopy while in most international studies it was measured by flouorophotometry.[25,26] This was due to non-availability of flouorophotometer in our hospital. Flach AJ and Kraff MC showed in their study that Ketorolac tromethamine solution was more effective than Dexamethasone solution in facilitating reestablishment of the blood aqueous barrier after surgery, as measured by fluorophotometry, and was equal to Dexamethasone solution as observed by slit lamp observations.[27]

In our study majority of cases after surgery had moderate degree of anterior chamber inflammation and only few cases had sever inflammation, so from our study we cannot conclude clearly whether Ketorolac tromethamine is equally effective in control of severe anterior chamber inflammation as is effective in moderate degree of inflammation. However literature is available which showed that Ketorolac tromethamine provides substantial anti- inflammatory activity in the treatment of moderate to severe anterior segment inflammation developing after cataract surgery and intraocular lens implantation.[28]

Also in our study the trial has been conducted in patients with uncomplicated cataract surgery. It is not known whether Ketorolac tromethamine is equally effective in treating inflammation associated with complications of cataract surgery.

This study showed that Ketorolac tromethamine is effective in reducing postoperative inflammation in terms of cells and flare after phacoemulsification and intraocular lens implantation.

CONCLUSION

Ketorolac tromethamine is an effective drug for control of postoperative inflammation after phacoemulsification and intra ocular lens implantation. Further studies are recommended to compare other NSAIDs e.g. flurbiprofen and diclofenac sodium with corticosteroids e.g. Prednisolone acetate and Rimexolone to find out most effective and safe drug.

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Bilal Bashir

ORIGINAL ARTICLE

Visual outcome after Nd: Yag Laser Anterior Capsulotomy in Patients with Anterior Capsular Contraction Syndrome

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ABSTRACT

Objectives: The objective of the study is to determine the visual outcome after ND YAG laser anterior capsulotomy in patients presented with anterior capsular contraction syndrome after phacoemulsification surgery

Material and Methods: This retrospective case series study was carried out in Eye Unit Lady Reading Hospital, Peshawar from Jan' 2013 and August'2014.A total of 50 eyes with anterior capsular contraction after phacoemulsification surgery were treated with ND YAG laser anterior capsultomy. Variable analyzed as visual acuity.

Results: Mean age group was 55 years with standard deviation of ±7.3. Total number of patients were 30 Male patients were 18 (60%) and female patients were 12 (40%). Mean duration of presentation was 6 months. In 18 eyes (60%) Acrylic Hydrophilic lens was used in phaco surgery while in 12 eyes(40%) hydrophobic lens was used. Frequency of improvement is high in treated group with improvement of two or more Snellen lines in 24(80%) of patients, one line improvement in 5 (16.66%) patients and no improvement in 1 (3.33%) patients.

Conclusion: Anterior capsular contraction syndrome can be safely and effectively treated with ND YAG laser anterior capsulotomy with better visual outcome.

Key words: ND YAG laser , Anterior capsular contraction syndrome, capsulotomy, Phacoemusification

INTRODUCTION

Anterior capsule contraction syndrome (ACCS), is the centripetal constriction and fibrosis of the capsulorhexis following cataract removal. It is also called as anterior capsular phimosis. This is a painless condition that remains asymptomatic unless the constriction progresses into the visual axis potentially resulting in decreased visual acuity, decreased contrast sensitivity and occasionally intraocular lens dislocation.

While rarely seen with can-opener-style capsulectomies with anterior radial capsular tears, it is relatively frequent with capsulorhexis. It is particularly common in patients with pseudoexfoliation and in eyes with a history of moderately severe uveitis.[1] Its effects, which include extreme reduction in the capsulectomy opening, malposition of the opening, reduction in equatorial capsular diameter, and displacement of the IOL, seem more exaggerated in small capsulorhexis openings and in the older patient. Vision can be impaired not only because of opacification of the media but also because of tilting, decentration, and buckling (foldable only) of the IOL. In severe cases the zonular traction may lead to IOL dislocation and retinal detachment. Anterior capsular shrinkage occurs more rapidly in the first 6 weeks postoperatively but continues slowly thereafter.[2,3]

It is now well recognized that capsule contraction syndrome is due to proliferation of residual anterior Lenticular Epithelial Cells (LECs) that leads to fibrous metaplasia and eventual reduction of the capsular opening. Electron microscopy studies have revealed these to be cells resembling fibrocytes surrounded by a dense collagen matrix.[4]

Capsular contraction has previously been reported to occur with polymethyl-methacrylate (PMMA) and with silicone intraocular lenses (IOLs), particularly plate haptic silicone IOLs.[2,5] Several authors have reported that the anterior lens capsule is more stable when in contact with an acrylic IOL (AcrySof) compared with PMMA and silicone lenses.[6,7]

Before ND:YAG laser, the treatment of anterior capsular opacification was surgical capsulotomy. Nowadays ND: YAG laser is safe and most effective outpatient method of anterior capsulotomy. ND: YAG laser is photo disruptive laser which along with heat, produces acoustic shock waves. This creates opening in the anterior capsule which results in improvement in visual acuity. ND: YAG laser anterior capsulotomy is occasionally performed in our hospital but no study has been performed in recent past on its visual outcome.

MATERIAL AND METHODS

This study was conducted in outpatient department of Eye Unit, Lady Reading Hospital Peshawar.

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A special proforma designed for the study was filled for each patient. After enrollment in the study history, Visual acuity (VA) using Snellen visual acuity chart and slit lamp examination was done. Patients were then dilated before the procedure. About 3-4 mm of capsulotomy was done. Patients were asked to come for follow up after one week. On follow up visits VA acuity was checked using Snellen chart and data was recorded on proforma. The data was analyzed using SPSS 10.1.Frequency and percentage was calculated for variables like age and visual acuity.

Inclusion criteria:

1. All patients both male and female between 40 and 70 years of age who have undergone phacoemusification surgery six months ago.

Exclusion Criteria:

1. Patients less than 40 years of age.
2. Patients who have undergone extracapsular cataract extraction with IOL.
3. Patients with complicated cataracts and uveitis

RESULTS

This study was conducted at Eye unit of Govt Lady Reading Hospital Peshawar. Total number of patients were 30. Gender distribution was male n=18(60%) and female n= 12(40%). Age distribution was analyzed . Patients in the age group 40-50 were n=5(16.66%) ,50-60 were n=12 (40%), 60-70 were n=10 (33.33%) and 70-80 were n= 3(10%). Mean duration of presentation was 6 months. In 18 patients (60%) Acrylic hydrophobic lens was used while in 12 patients (40%) Acrylic hydrophilic lens was used. The pretreatment visual acuity was 6/12 in 10 (33.33%) patients,6/18 in 8 (26.66%) patients, 6/24 in 10(33.33%) of patients and 6/36 in 2 (6.66%) of patients.

The post treatment visual acuity was 6/6 in 12 (40%), 6/9 in 9 (30%) patients, 6/12 in 6 (20%) patients and 6/18 in 2 (6.66%) and 6/24 in 1(3.33%) patients. Frequency of improvement is also high in treated group with improvement of two or more Snellen's lines in 24(80%) of patients, one line improvement in 5 (16.66%) patients and no improvement in 1 (3.33%) patients.

Table-1: Pretreatment assessment ofdistant visual acuity (n=30)

Pre Treatment VA	Frequency	Percentage
6/12	10	33.33%
6/18	8	26.66%
6/24	10	33.33%
6/36	2	6.66%

Table-2: Post treatment assessment of distant visual acuity (n=30)

Post treatment VA	Frequency	Percentage
6/6	12	40%
6/9	9	30%
6/12	6	20%
6/18	2	6.66%
6/24	1	3.33%

DISCUSSION

Cataract Phacoemulsification with continuous anterior capsulorhexis and foldable intraocular lens implantation into the capsular bag has become basic, standard method in cataract surgery and curvilinear capsulorhexis, the most common technique for opening the anterior lens capsule. The opening made during the operation, within several months of postoperative evolution gradually constricts and in extreme cases it may even close completely. That course of healing is not desirable because of evoking a noted impairment of vision. Decreasing in the anterior capsule opening is observed mostly in eyes with weakened lens zonules. It happens in high myopia, retinitis pigmentosa, diabetes mellitus, pseudoexfoliation syndrome, uveitis and people of well advanced age.[8]

In this study we have studied 30 eyes of different age groups for anterior capsular contraction syndrome. In another study 32 patients were studied for a follow up of three months [9]. In this the procedure was successful in 25 case; (78%). Failed cases (n = 7, 22.0%) included 5 cases of re-phimosis and 2 cases with progressive IOL decentration.

In our study the mean onset of anterior capsular contraction was 6 months. In other studies the onset of decreased visual acuity in ACCS patients can range from 2 weeks to more than 3 months.[10,11] Capsule shrinkage and closure involves contraction of the fibrous membrane following fibrous metaplasia of lens epithelial cells(LEC) as well as LEC proliferation and outgrowth from the anterior capsule margin onto the IOL toward the center of the capsular opening,[12,13] likely mediated by LEC cytokine signaling.[14]

It has been suggested that the variable incidence of ACCS in the context of IOL type is due to insufficient peripheral capsule expansion by the IOL.[15] Maximal rate of contraction appears to occur within the first 6 weeks following surgery and tends to be more pronounced with silicone lens implants.[16] The rate of anterior capsular opacification is lowest with acrylic lenses and higher with plate-haptic silicone lenses.[17] Aiming for a capsulorhexis size of between 5.5 and 6 mm along

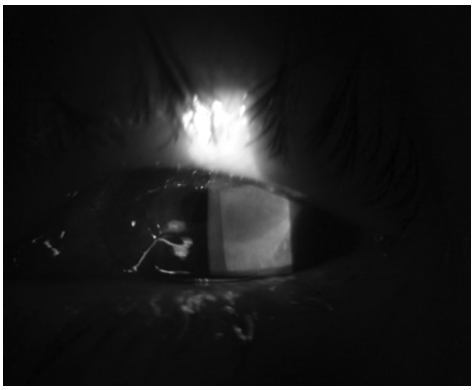
with careful clearance of cortical lens matter is thought necessary to preserve the pupillary zone thus preventing progressive shrinkage of the capsular opening.[18]

Complete occlusion of the capsulorhexis opening is extremely rare and has been previously reported using PMMA lenses in patients with pre-existing ocular pathologies.[19] Capsular phimosis without complete occlusion of the capsulorhexis opening has been reported using an AcrysofÂ® lens.[20] Miyake and co-workers report a greater incidence of ACO(Anterior Capsular Opacification) with hydrophobic IOLs compared to hydrophilic IOLs. Reports focusing on the effect of haptic design on ACO development are conflicting. According to some authors, the sharp-edge IOL haptic design is regarded as a risk factor for ACO development with acrylic and silicone IOLs, while on the other hand, they are regarded as a prophylactic factor for PCO development.

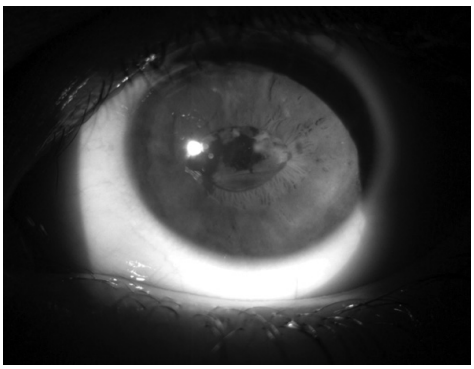
It is imperative that Nd-YAG laser anterior capsulotomy must be performed by an experienced practitioner due to the increased risk of creating pits compared to performing Nd-YAG capsulotomy in the posterior capsule.[23]

CONCLUSION

Our study has shown that visual acuity is better in patients who have undergone ND: YAG laser anterior capsulotomy for capsular contraction syndrome than before the procedure.



Anterior capsular contraction involving the visual axis



After treatment with ND YAG laser

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ORIGINAL ARTICLE

The Short Term and Long Term Complications of Racquet Shaped Nd: Yag Laser Posterior Capsulotomy

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Shahid Jamal Siddiqui FCPS[3], Altaf Hussain Shaikh. DLO, MS[4], Khalid Rasul Shaikh MBBS[5]

ABSTRACT

Aims of Study: To document the short term and long term complications of Racquet shaped Nd: YAG laser posterior capsulotomy.

Study Design: Prospective observational study.

Place and Duration: Department of Ophthalmology Chandka Medical College Civil Hospital Larkana from March 2009 to March 2011.

Patients and methods: The study comprises 500 patients selected from OPD from March 2009 to March 2011, who underwent Nd: YAG laser posterior capsulotomy in a Racquet shaped pattern. Abraham capsulotomy contact lens was placed onto the eye. The aiming beam was focused on the posterior capsule 1 mm inside the IOL edge. Nd: YAG laser was applied to create a racquet shaped opening in the posterior capsule.

Result: In this study there were 260 males and 240 females with mean age of 61.4 years. The mean duration between cataract surgery and capsulotomy was 1.4 years. At last follow up the visual acuity improved in 86.3 % cases. Mean laser shots applied were 22.3 (SD=6.5) with a mean power 1.3 ml SD (.04). Acute complications in first week included bleeding from iris, pitting to the IOL, hanging flap, transient rise in intraocular pressure, transient anterior chamber reaction, cystoid macular edema which resolved over a period of six months. Retinal detachment was noted in six cases after a period of at least two years follow up.

Conclusion: Racquet shaped Nd: YAG laser poster capsulotorny is a safe and effective procedure which can be adopted by skilled ophthalmologists without any significant harm to the patients.

Key words: Nd: Y AG laser, capsulotomy, posterior capsular opacification

INTRODUCTION

Posterior Capsular Opacification (PCO) is one of the major causes visual disability all over the World.[1,2] According to the Pakistan National Blindness and visual impairment survey posterior capsular opacifications ranked fourth among the treatable causes of blindness.[3] Posterior capsular opacifications can be treated by surgical methods as well as by using Neodymium YAG Laser.[4,5] Different strategies are used to perform Y AG Laser capsulotomies. Most of the surgeons prefer to aim the laser beam at the centre of the opacified capsule thus treating at the axial zone of the IOL through un-dilated pupils. Prevalence of IOL damage has been reported as being between 40% to 81%.[6] Additionally a small opening in the posterior capsule is associated with various complications and drawbacks,[7] To avoid these complications and drawbacks we adopted the technique of racquet shaped capsulotomy originally described by Thorin and Archila.[8] In this article we present the short term and long term complications in patients who underwent Nd: Y AG laser posterior capsulotomies creating a racquet shaped opening in the posterior capsule.

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PATIENTS AND METHODS

An observational prospective cohort study conducted at the department of Ophthalmology Chandka Medical College and Civil Hospital Larkana after obtaining informed consent from all the participants between March 2009 and March 2011. Patients with visually significant posterior capsular opacification were selected from the outpatient department of Ophthalmology Civil Hospital, Larkana. Patient were ***excluded*** from the study if there was a history of uncontrolled glaucoma, advanced glaucoma, hazy cornea, very dense posterior capsular opacification, any posterior segment pathology likely to cause decreased vision after treatment. Baseline data was obtained for each patient before initiation of treatment on a prescribed proforma of each patient underwent complete workup which ***included*** a full ocular and medical history, best corrected Snellen's visual acuity, slit lamp biomicroscopy, Goldmann's applanation tonometry, gonioscopy and fundoscopy. Pupils were dilated with Tropicamide 1% and Phenylephrine 10% eye drops. Immediately before the laser procedure a single application of Proparacaine 0.5% was instilled onto the eye scheduled for Nd: YAG laser capsulotomy. All the capsulotomies

were performed by a qualified ophthalmologist. Five hundred eyes of five hundreds patients underwent the procedure with a pulse duration of 4 nanosecond, a spot size of 8 micron, and pulse energies ranging from 0.5-2.0 mJ, coupled to a slit lamp delivery system with a 1064 nm laser beam. With the patient seated at the slit lamp system, Abraham capsulotomy contact lens (ocular instruments) was placed onto the eye. The aiming beam was focused on the superior capsule 1 mm inside the IOL edge. Nd: YAG laser (LightMed PULSA SYL 9000 Nd: Y AG) was applied with a 8.0 micron spot size and a power of 0.5 to 2.0 mJ and pulse duration of 4.0 nanosecond, to create small openings in the capsule from 12 to 7 'o'clock position and then from 12 to 5 'o' clock position. A stalk was created by applying few laser shots vertically downward from 5 and 7 'o'clock position. Postoperatively, patients were prescribed prednisolone 0.1% eye drops four times a day for 5 days and timolol maleate eye drops 0.5% two times a day for one week. Patients were examined at 1 hour, 1 day, one week, two weeks 1 month, 3 months and 6 months, one year and then every six months, Patients were advised to report any visual complaint to the principal investigator after the laser process. At each visit patients were invited to report any symptoms of ocular morbidity and an ophthalmic examination was performed, which included visual acuity measurement, slit lamp biomicroscopy and Goldman applanation tonometry. In addition gonioscopy and funduscopy were also performed. Short term complications were defined as intraoperative and during first week after treatment. Long term complications were defined as the abnormal findings at last follow up which was at least three years after which patient was censored. Patients were also censored if a complication like retinal detachment took place. Statistical analysis was performed on SPSS version IS for windows. Frequency distribution tables were used to present the data. Mean and standard deviation were used for continuous variables. Categorical variables were presented as proportions and percentages.

Table-1: Visual Outcome

S. No	Visual acuity	Number	Percent
1	Decrease two lines or more	20	5.0
2	No improvement	46	9.2
3	Two line improvement	107	21.4
4	More than two line improvement	327	65.4

Table-3: Incidence of retinal detachment after Nd: Yag laser capsulotomy

S. No	Complications	Frequency	Percentage
1	Bleeding from the iris	04	0.8
2	Pitting of IOL	112	22.4
3	Hanging Flap	16	3.2
4	Transient IOP rise	243	48.6
5	Transient anterior chamber reaction	73	14.6
6	Cystoid macular edema	46	9.2
7	Retinal detachment	06	1.2

RESULTS

In this study there were 260 (52%) males and 240(48%) females with mean age of 61.4 year (SO= 12.26). The mean duration between cataract surgery and capsulotorny was 1.4 years. 167 (22.8 %) patients were from rural area of Sindh 232(46.4%) from Larkana 126 (25.2%) and 42(8.4 %) from different areas of Baluchistan Initial visual acuity ranged from 6/18 to. 6/36. At last follow up the visual acuity outcome is shown in table I. Mean laser shots applied were 22.3 (SO=6.5) with a mean power 1.3 mJ (SO=0.04). Acute complications in first week included bleeding from iris, pitting to the IOL, hanging flap, transient rise in intraocular pressure, transient anterior chamber reaction, cystoid

Table-2: short- term complications after Nd-Yag laser posterior capsulotomy

S.No	Study Population	follow up period	Type of capsulotomy	Incidence of RD	Author
1	314	4 weeks	Racket shaped	None	Shaikh et al"
2	460	6 months	Central	0.87 %	Dawoodet al""
3	104	1 year	Central	1.6	Burq&Taqi[ll]
4	341	5 years	Central	2.0	RantaEt at"
5	789	3years	Central	0.86	Steinertet al \3
6	2110	6 months	Central	0.5	Stark et al "
7	500	4 weeks	Central	None	Khazada et al"
8	730	3 years	Racket shaped	1.7	Ahmed&Quraihsy
9	500	2 years	Racket shaped	1.2	M Amin&SyedImtiaz Ali Shah

macular edema which resolved over a period of six months, Retinal detachment was noted in Six cases after a period of at least two years follow up (table 2)

DISCUSSION

In this study we have included in analysis only those cases who have completed the follow-up of at least two years to document the retinal complication of YAG laser capsulotorny by employing Racquet shaped methodology as a higher amount of total energy is required in this method. Incidence of retinal detachment observed by different observers is shown in table 3. In our series incidence of retinal detachment is 1.2% which is not different from finding of other researchers for the same follow up period,[9,10] when we perform a capsulotomy by using a Racquet shaped method we focus the light on the capsule as there is a little danger of intraocular lens damage.[11] This makes less disruption to anterior vitreous face.[12] In addition we have used less amount of energy not more than 2.0 mJ in any case and usually less than 1.0 mJ. At a lesser amount of energy settings laser act on cutting mode rather than disruptive mode.[13,14,15]

CONCLUSION

Racquet shaped Nd: Y AG laser poster capsulotomy is a safe and effective procedure which can be adopted by skilled ophthalmologists without any significant harm to the patients.

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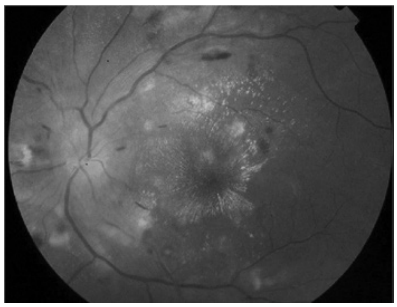

The findings are indicative of grade 4 hypertensive retinopathy, with widespread hemorrhages, cotton-wool spots, hard exudates in a star shape in the macular region, and swelling of the optic disks. The blood pressure was 220/140 mm Hg, and **severe preeclampsia** was diagnosed. An underweight baby was delivered. The exudates resolved spontaneously in the postpartum period.

(Newsnet-online)

Hasan Yaqoob

ORIGINAL ARTICLE

Efficacy of Brimonidine plus Timolol in the Treatment of Primary Open Angle Glaucoma

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ABSTRACT:

Glaucoma is the one of the leading cause of blindness globally as well as in most regions according to the WHO survey 2002. It accounts for 12.3% of global blindness (Vision <20/200 in better eye). In Pakistan primary open angle glaucoma is the most common type followed by primary angle closure, aphakic, secondary and congenital glaucoma. The causes of secondary glaucoma are mainly four folds i.e., neovascular, uveitis, lens induced and traumatic. Commonly used medical treatments for glaucoma are topical or oral agents that decrease aqueous humor production or augment outflow. Fixed combinations of IOP-lowering medications have been developed by combining different pharmacologic classes of ocular hypotensive drugs commonly pre-scribed for the treatment of elevated IOP. Modern fixed combinations pair beta-blocker with either prostaglandin analogs or carbonic anhydrase inhibitors.

Objective: To determine the efficacy of brimonidine plus timolol in the treatment of primary open angle glaucoma.

Materials and Methods: This study was conducted in the Department of ophthalmology, Lady Reading Hospital Peshawar from November 1, 2013-Jun 30, 2014. Through a randomized controlled trial study design, a total of 153 patients presenting with primary open angle glaucoma were randomly allocated, patients were subjected to fixed combination of Brimonidine plus Timolol (BT). All patients were followed up after 4 weeks of and results were recorded.

Results/ Treatment: The mean age of the patients was 52.3 $\pm$ 7.8 years. The mean baseline IOP was 28.39 $\pm$ 1.7 which was reduced by 18.5 $\pm$ 4.2. The efficacy (25% reduction from baseline IOP) was observed in 66.7% of patients.

Conclusion: Fixed combination of BT is an effective combination in the treatment of primary open angle glaucoma.

Key Words: Primary open angle glaucoma, intraocular pressure, Brimonidine, Timolol, efficacy.

INTRODUCTION

According to the World Health Organization (WHO) global estimation in 2002, more than 161 million people were visually impaired, of whom 124 million people had low vision and 37 million were blind worldwide. It was also estimated that up to 75% of all blindness is avoidable.[1]

Glaucoma is one of the leading causes of blindness globally as well as in most regions according to the WHO survey 2002. It accounts for 12.3% of global blindness (Vision <20/200 in better eye)[1]. Glaucoma was found to be the fourth most common cause of blindness in Pakistan.[2]

Risk factors for POAG include older age, black race, family history (first-degree relative), thinner central corneal thickness, myopia, and elevated intraocular pressure (IOP). Elevated intraocular pressure (IOP) is the only currently treatable risk factor for OAG, although a high percentage of individuals with elevated IOP do not develop glaucoma.[3]

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Treatment of POAG is either medical or surgical. Various classes of intraocular pressure lowering drugs have been identified in the last two decades either individually or in combination however, to improve the patient adherence and quality of life, various fixed combinations are usually advised to patients with primary open angle glaucoma.[4]

Fixed combinations of IOP-lowering medications have been developed by combining different pharmacologic classes of ocular hypotensive drugs commonly prescribed for the treatment of elevated IOP. Modern fixed combinations pair beta-blocker with either prostaglandin analogs or carbonic anhydrase inhibitors.[5]

While mono-therapy with a single class of medication may be effective in lowering IOP, many patients require more than one medication for the adequate, long-term control of IOP.[6] Therefore, in clinical practice, a two-drug regimen, consisting of a topical beta-blocker in combination with a carbonic anhydrase inhibitor or prostaglandin analog, is commonly administered to patients with insufficient IOP control with mono-therapy. Fixed combinations of a beta-blocker and a carbonic anhydrase inhibitor that are currently available include brinzolamide 1%/timolol 0.5% (BT) and dorzolamide 2%/timolol 0.5% (DT). In a previous clinical study, the IOP-lowering efficacy of brinzolamide/timolol was non-inferior to dorzolamide/timolol in patients with

open-angle glaucoma or ocular hypertension.[7]

In one study, the relative reductions for mean diurnal IOP were 29.9% for dorzolamide/timolol and 28.1% for brimonidine/timolol.[4] In another study, at baseline, IOPs were (BT: 14.1 ± 2.9 mmHg, DT: 14.5 ± 2.9 mmHg; *P* = 0.658), at 4 weeks (BT: 13.8 ± 2.6 mmHg, B: 14.3 ± 2.8 mmHg; *P* = 0.715) and at 12 weeks (BT: 14.1 ± 2.7 mmHg, B: 14.2 ± 2.7 mmHg*; P* = 0.538).[8] However, in another study a significant number of patients showed more than 20% reduction in IOP from baseline in BT as compared to DT group (67.0% versus 30.4%; P < 0.001).[6] Another study also showed that 87.7% patients in the BT groups showed successful reduction of IOP from baseline at 4 weeks follow up.[9] In another study, percentage of IOP reduction in BT group was 43.57% and in DT group it was 37.67%.[5]

While the IOP-lowering efficacy of any glaucoma therapy is critical, selection of a suitable topical ocular medication for glaucoma also depends on other factors that may influence patient adherence to therapy, such as drop comfort upon instillation and overall tolerability.[10]

The present study is designed to determine the efficacy of fixed combination of Brimonidine/Timolol in the treatment of primary open angle glaucoma in our local population. The idea behind doing this study was subjected to our mind while observing patient turnover with POAG and failures with mono-therapy. Also while looking into literature, though a variety of studies are available but either this is done on insufficient sample size but also the results show to be inconclusive and controversial and cannot favor any of the drug combinations. This study will provide us with local statistics for the efficacy of BT in the treatment of POAG and will suggest local ophthalmologist for further research and routine use of these drug combinations for the treatment of POAG.

Objective: To determine the efficacy of brimonidine plus timolol in the treatment of primary open angle glaucoma

Efficacy: It was determined in terms of reduction in intraocular pressure from baseline. A reduction of> 20% from baseline at 4th week of treatment was considered effective.

MATERIALS AND METHODS

Study Design: Randomized controlled trial

Study Settings: Department of Ophthalmology, Lady Reading Hospital Peshawar.

Sample Size: 153

Sampling Technique: Consecutive (non probability) sampling.

Study Duration: 08 MONTHS From 1/11/2013 to30/06/2014.

SAMPLE SELECTION

Inclusion Criteria:

- All patients with primary open angle glaucoma with baseline IOP of at least 25mmHg.
- Adults with age above 18 years
- Either gender.

Exclusion Criteria:

- Patients with history of chronic glaucoma on medical records.
- Patients with blast injuries on history.
- Any history of ocular or refractive surgery.
- History of argon laser trabeculoplasty.

The above mentioned conditions act as confounders and if included would have introduced bias in the study results.

Data collection procedure

The study was conducted after approval from hospital ethical and research committee. All patients meeting the inclusion criteria i.e. with primary open angle glaucoma and having baseline IOP of at least 25mmHg (as mentioned above in operational definitions) were included in the study through OPD/ER department. The purpose and benefits of the study were explained to all patients and a written informed consent will be obtained.

A detailed history followed by completed ophthalmologic examination was done on all patients that will also include slit lamp examination, fundoscopy, gonioscopy and ultrasonographic bimicroscopy. Patients were subjected to fixed twice daily combination of brimonidine 0.2% plus timolol 0.5% (BT). All the ophthalmologic examinations and treatment supervision were done by single expert ophthalmologist. All the patients were followed up at 4th week of treatment and a check IOP was measured to determine the efficacy of the combination in terms of reduction in more than 20% of IOP from baseline.

All the above mentioned information was recorded in a pre -designed proforma. Strictly exclusion criteria were followed to control confounders and bias in the study results.

Data Analysis Procedure

Data collected was analyzed in SPSS version 10. Mean ± SD was calculated for numerical variables like age and baseline IOP and follow up IOP. Frequency and percentages were calculated for categorical variables like gender and efficacy. All results were presented as tables and graphs.

RESULTS

The study comprised a total of 153 patients diagnosed with primary open angle glaucoma according to

operational definitions. The patients were subjected to fixed twice daily combination of brimonidine 0.2% plus timolol 0.5% (BT).

The mean age of the patients of the whole study population was 52.3 ± 7.8 years. (Table 1) The mean baseline IOP was 28.39 ± 1.7 (Table 2). While distributing the sample with regards to gender, there were 91 (59.5%) males and 62 (40.5%) females. (Table 3)

We also distributed the patients with regards to different age groups. We took four age group i.e. up to 40 years, 40.01 to 50 years, 50.01 to 60 years and 60.01 and above. It reflected that the glaucoma is more common in the age group above 40 years. (Table 4) All the patients were subjected to standard doses of the combination regime as per details mentioned above. All the patients were followed up on the 4th completed week of treatment and follow up observations were recorded for comparisons. The mean follow up IOP was 18.5 ± 4.2 (Table 5)

As per our operational definition of efficacy, 25% reduction from baseline IOP was considered efficacy. According to this, 25% reduction (efficacy) was recorded in 66.7% of patients. (Table 6). While stratifying the efficacy among gender, out of 91 males 78% showed efficacy and out of 62 females, 50% showed efficacy. (Table 7). We also stratified the age groups wise efficacy of combination therapy. The details are mentioned in Table 8

Table-1: AGE distribution in years (n=153)

	N	Mean	Std. Deviation	Std. Error Mean
Age of Patient	153	52.3137	7.80475	.63098

IOP= intraocular pressure

Table-2: baseline IOP (n=153)

	N	Mean	Std. Deviation	Std. Error Mean
Baseline IOP	153	28.3922	1.70346	.13772

IOP= intraocular pressure

Table-3: gender wise distribution of patients (n=153)

		N
Gender of the Patient	Male	91
	Female	62
Total		153

IOP= intraocular pressure

Table-4: age wise distribution of patients (n=153)

		n
Age Groups	upto 40 years	10
	40.01 to 50.00 years	61
	50.01 to 60.00 years	52
	60.00 and above	30
Total		153

IOP= intraocular pressure

Table-5: comparison of follow up IOP (n=153)

	N	Mean	Std. Deviation	Std. Error Mean
Follow up IoP	153	18.5359	4.20858	.34024

IOP= intraocular pressure

Table-6: Drug efficacy (n=153)

	25% reduction from baseline IoP		Total
Drug efficacy	Yes	No	
	102	51	153

IOP= intraocular pressure

Table-7: Gender Stratifications (n=153)

		Gender of the Patient		Total
		Male	Female	
Efficacy of the Drug	Yes	71	31	102
	No	20	31	51
Total		91	62	153

IOP= intraocular pressure

Table-8: age groups wise stratification (n=153)

		Efficacy of the Drug		Total
		Yes	No	
Age Groups	upto 40	10	0	10
	40.01-50	30	31	61
	50.01-60	32	20	52
	60.01 +	30	0	30
Total		102	51	153

IOP= intraocular pressure

DISCUSSION

Primary OAG continues to be enigmatic in some patients, with continued progression of the disease, despite significantly lowered IOP. Vascular considerations in patients with OAG continue to be actively discussed,[11] with ever-increasing data to support their relevance in optic neuropathy. It is, therefore, important to establish the hemodynamic profile of glaucoma treatments, in addition to their effects on IOP.

Fixed combinations of different classes of IOP-lowering agents in the same bottle offer advantages over the use of the same individual drugs in separate bottles, such as a simplified dosing regimen and the elimination of the washout effect that occurs when multiple drugs are instilled without an adequate waiting period between instillations.[12]

IOP can be lowered by pharmacological therapy, laser therapy, or incision surgery (alone or in combination).[13] Topical medications are an effective initial therapy in many patient,[13] but studies have shown that it is often necessary to use multiple topical medications to achieve target IOP.[14] For patients in whom treat-

ment with multiple topical medications is required, this may be achieved by administering each medication separately from different bottles, or by using a fixed-combination product that combines medications in a single bottle. The reduction in IOP achieved with a fixed combination of two agents is greater than that with either agent alone, and is at least equal to that with the two components administered from separate bottles.[15] Fixed-combination products have the potential to further facilitate IOP reduction. Such products combine two medications with combined or complementary actions on IOP. In addition, they may reduce "washout" effects that may occur with sequential administration of two separate topical medications (where the first medication may be washed away by the second), and may encourage better patient adherence and persistence with treatment.[16]

Combination therapy has been consistently proven to be more effective in IOP reduction than monotherapy.[17] In present study, the mean IOP reduction from baseline was seen more in BT with an efficacy of 66.7%. One trial found that 1% brinzolamide/0.5% timolol was superior in IOP-lowering efficacy to either brinzolamide 1% or timolol 0.5%.[18]

Previous meta-analysis including 28 randomized clinical trials evaluated the IOP lowering effects of all commonly used mono-therapies in patients with POAG, and revealed that the relative peak IOP reductions was 27% for timolol, 25% for brimonidine and 22% for dorzolamide.[19] The present study found that when using as fixed combinations with timolol and brimonidine can result an IOP-lowering effect but more when used with brimonidine.

Fixed combinations, i.e., two drugs contained in a single bottle, have emerged as a treatment option, offering several advantages and fewer adverse events. A number of studies have evaluated the efficacy and safety of these combinations and it has been demonstrated that combinations are superior to monotherapy with their constituent parts.[20]

García-Sánchez et al[21] compared administration of a fixed combination of latanoprost + timolol with an unfixed combination of brimonidine and timolol in patients with elevated IOP for 6 months. They observed that the fixed combination reduced IOP more effectively at all assessment times and was better tolerated than the unfixed combination. Although our study is different because we used fixed combinations and did not use a prostaglandin analog, we can compare our results for IOP reduction taking into account the use of fixed combinations, and we observed that BT combination is effective choice of drug.

Our study results demonstrated that a even double combination of BT is very effective in POAG. The ultimate goal of treating glaucoma is to preserve the remaining visual field. Only treatment to reduce IOP has shown evidence of being effective in preserving the visual field. Monotherapy remains the preferred initial choice of treatment in glaucoma, using prostaglandin analogs and β-blockers as initial treatment for lowering IOP. Prostaglandin analog eye drops are preferred due to their strong IOP-reducing action and the convenience of requiring only once-daily administration, except in the event of side effects, intolerance, or patient refusal. Nevertheless, target IOP levels are not always achieved with a single medication, and patients frequently require multiple medications, which can lead to unsatisfactory adherence with treatment.[22]

The results of the present study suggest brimonidine/timolol does reduce IOP in established IOP-controlled glaucoma patients. In this study, POAG was found to be most prevalent in age group above 40 years and more prevalent in males than females. These findings are consistent with those reported from India.[23]

Use of two or more bottles of IOP-lowering medication may be associated with an increase in noncompliance, and the advantage of fixed combinations is that a single bottle can contain up to two or three medications, thus minimizing the number of bottles and drops that need to be used by the patients, and facilitating adherence to treatment. Fixed combinations are important adjuncts for the treatment of glaucoma but should generally be used only when mono-therapy has not provided adequate IOP reduction. BT is a good treatment option when a combination is required. One possible disadvantage is that BT must be administered twice a day as opposed to prostaglandins, which only need to be administered once a day. Another possible disadvantage is that the incidence of treatment-related adverse events could be higher on BT than on any other combination. Another drawback could be that it is not possible to change the drug concentration or dosing schedule for one component medication independently of the other when using a fixed combination like BT. Further studies will be needed to determine the long-term safety and efficacy of a fixed combination of e.g. BT, DT or even triple combination like TBD, as well as its effectiveness in providing additional IOP-lowering over 24 hours.

CONCLUSION

Our study proves that fixed combination of Brimonidine plus Timolol is effective. Since literature also suggests that triple combination of drugs may also be used in the treatment of POAG, we will suggest more

randomized controlled trials before drawing recommendation for future treatment of primary open angle glaucoma.

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ترے سینے میں ہے پوشیدہ رازِ زندگی کہہ دے
مسلماں سے حدیثِ سوز و سازِ زندگی کہہ دے
اقبال

Bisma Ikram

ORIGINAL ARTICLE

Comparison of Eye Axial Length Measurements in Sitting and Supine Position with Contact A-Scan Biometry

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Umar Ikram MBBS[3], Maha Amjad MBBS[4]

ABSTRACT

Background: Biometry i.e. the measurement of the eye axial length is performed in patients before cataract surgery and in studies on refractive errors.

Purpose: To compare axial length measurements obtained in sitting and supine position by contact A-scan biometry.

Materials and methods: Axial length of 55 non paired eyes was measured using contact method in both sitting and supine position, randomly as to which perform first to avoid measurement bias.

Results: The mean axial length in supine position was 22.68 mm (min 21.25 mm, max 24.53 mm), compared to mean of 22.63 mm (min 21.22 mm, max 24.53 mm) obtained in sitting position, (SD <0.10). Axial length obtained in supine position was on average 0.05 longer than obtained in sitting position. A statistically significant difference was proved between making measurements in sitting and supine position (p=0.000). 50 eyes (90%) had longer axial length, 4 eyes (7.3%) had same axial length and only 1 eye (1.8%) had shorter axial length in supine position compared to axial length in sitting position.

Conclusion: The axial length value obtained in supine position was longer than obtained in sitting position. Less corneal compression and better target fixation makes the supine position superior to sitting position.

INTRODUCTION

Axial eye length is the distance from anterior surface of cornea to the fovea centralis.[1] Axial length assessment is an important test in ophthalmic practice, for example, in studies on refractive errors.[2] and cataract surgery.[3] It may also be indicated in other pathologies.[4] longer in males and a p-value of 0.001.[9] 9% of K readings are within the range 40D to 48D.[8] The anterior chamber depth in phakic eyes has been found to measure 3.24mm (± 0.44m).[10] The value of average cornea thickness is 0.55mm and centre thickness of crystalline lens is about 3.6mm in its un-accommodated state.[11]

The keratometer is used to measure the radius of curvature of anterior corneal surface. It measures the radius of curvature of a central zone of the cornea approximately 3mm in diameter.[13] Keratometry usually performed in conjunction with A-scan biometry to calculate the IOL power for cataract surgery. Keratometry readings should always be obtained prior to the axial length measurement. This is because A-scan biometry may cause mild distortion of corneal mires, resulting in inaccurate readings.[5]

The axial eye length is conventionally measured with ultrasonography, using a biometry unit. Measurement of axial length is achieved using a contact technique or an immersion technique [5]. In contact technique the probe of ultrasound is held in hand and placed gently on the anterior corneal surface [14]. The patient is examined in the sitting position or supine position with a drop of local anesthetic is instilled in both eyes. The patient is then asked to look at the fixation target placed at the distance of 6m. Probe is placed gently on the cornea and A-scan echogram is displayed on the screen. A-Scan pattern obtained with contact technique is shown in Fig-1.

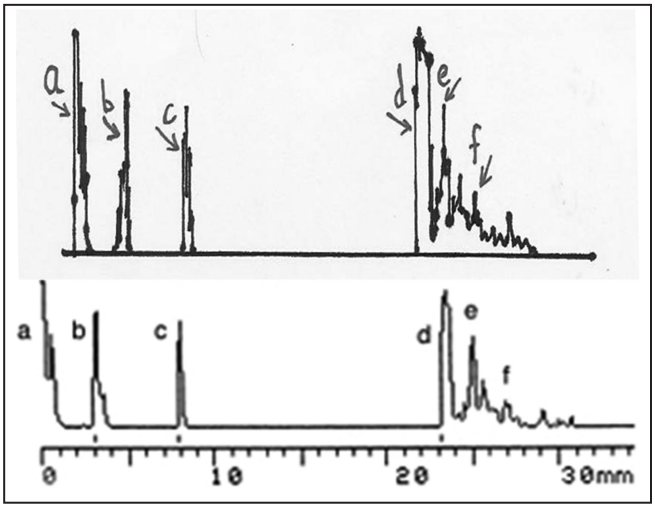

Fig-1: A-Scan pattern obtained with contact technique a: cornea b: Anterior capsule of lens c: Posterior capsule of lens d: Retina e: Sclera f: Orbital fat

Steeply rising spikes for anterior lens capsule (b) and Retina (d) indicate correct position and alignment of probe for optimal measurement of axial length. Spikes

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for sclera (e) and orbital fat (f) are smaller than those of retina and show a quick descending pattern. Absence of this pattern shows the direction of probe at the optic disc.[15] Immersion Technique is moreover similar to contact technique with a crucial difference that the probe doesn't come in direct contact with the cornea, making it a preferred technique.[16]

The patient is examined in the supine position with a drop of local anesthetic is instilled in both eyes. A scleral shell is place between the eyelids (Prager shell or Hensen shell). The scleral shell is filled with methylcellulose. The solution should be free of air bubbles. (The presence of small air bubbles within the fluid between the probe and cornea can result in the display of additional spikes in the echogram to the left of corneal spike). The probe is immersed in the solution, keeping it 5 to 10 mm away from the cornea. The patient is directed to fixate at a point placed on ceiling with the fellow eye. The probe is gently move until it is properly aligned with the optical axis of the eye and an acceptable A-scan echogram is displayed on the screen. Pattern obtained with immersion technique is shown in Fig-2.

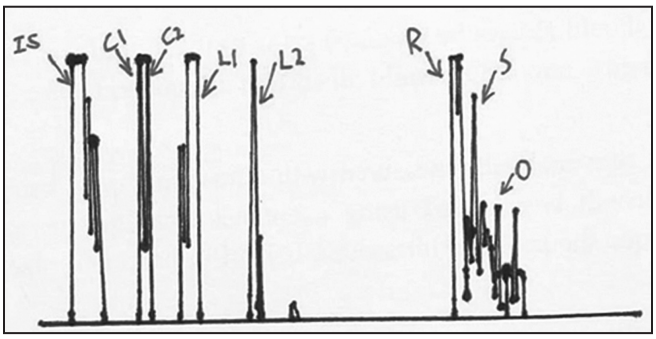

Fig-2: IS: Initial spike, C1: Anterior corneal surface, C2: Posterior corneal surface, L1: Anterior lens capsule, L2: Posterior lens capsule, R: Retina, S: Sclera, O: Orbital tissue.

The drawback of ultrasound biometry is the use of local anesthetics and physical contact of cornea with the ultrasound probe, causing corneal indentation[17] which may even come from a well experienced hand. Range of this error is usually seen to be between 0.14-0.28mm which may additionally be affected by fluid meniscus developing between probe and cornea giving falsely larger axial lengths.[18] A 0.1mm error in an average length will result in about 0.25D error,[19] and 0.2mm error will result in about 0.50D change in IOL power. It can generate large number of patients with postoperative refractive error. The current study assessed the difference in axial length in sitting and supine position and found the most appropriate position for axial length measurement.

MATERIAL AND METHODS:

Our study was cross-sectional comparative study conducted in Department of Ophthalmology at Fauji Foundation Hospital, Rawalpindi from 10th October 2012 to 15th December 2012. A total of 60 patients were included in study. ***Inclusion criterion*** set was patients of age above 20 years and a visual acuity of >6/18 on snellen acuity chart. The ***exclusion criterion*** on the other hand was with patients having high axial myopia or hyperopia, any previous history of ocular trauma, ocular surgery, corneal or ocular infection. Patients who were either previously diagnosed or during detailed screening done in Eye OPD of glaucoma, staphyloma, macular disease, retinopathy or ocular tumor were also excluded. All patients underwent a complete ophthalmic examination including adnexa of eye, anterior chamber and fundus, best spectacle-corrected visual acuity, corneal power (K-value) measurements, axial length measurements. Data was recorded and analyzed in SPSS version 18. Automated keratometer was used to find out the corneal power. Eye axial length measurements were taken with contact ultrasound biometry with a probe of 10 MHz using topical anesthesia.

RESULTS:

The mean age of our subjects was 24.3. The mean ocular axial length of 55 non paired eyes was 22.66 mm. the mean axial length in sitting position was 22.68 (min 21.25 mm, max 24.53 mm) and mean axial length obtained in sitting position was 22.63 mm (min 21.22 mm, max 24.53 mm). Paired T-test was used to compare the mean results. (TAB#1) There is significant difference in the scores for axial length value obtained in supine position (M= 22.687, SD= .73312) and sitting position (M= 22.6389, SD= .72593) conditions; t (54) = 9.574 P= .000 The results suggest that supine position does have an effect on axial length value of eye. Specifically, our results suggest that patients in sitting position, the axial length decrease.

Table-1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Standard Deviation
Axial length in supine position	55	21.25	24.53	22.6871	.73312
Axial length in sitting position	55	21.22	24.51	22.6389	.72593

There is significant relationship with keratometry readings (corneal refractive power) and axial length in both supine position (correlation value r= -.541) and sitting position (correlation r= -.546). It means that the axial length may varies with keratometry readings (corneal refractive power), as greater the corneal power shorter will be the eye axial length as is shown by a

negative correlation value. This is true for eyes without any pathology.

DISCUSSION:

Ultrasound has been the conventional method of measuring both the axial length and anterior chamber depth. Its drawback includes the use of local anesthetics and physical contact of the ultrasound probe with the cornea. The contact technique may also result in a shorter axial length specially when using hand-held method (holding the probe by hand), which can be performed in sitting and supine position. The current study found the difference in making measurements in sitting position and supine position. Axial length value obtained in supine position is longer than obtained in sitting position. The difference is clinically significant. There is a rule of thumb stated that 1mm axial length change is equivalent to 3D change in refractive error. A 0.1mm change in axial length will result in about 0.25D change in estimated IOL power, thereby resulting in postoperative refractive error.

When using immersion technique patient should be in supine position. According to the literature the results of immersion technique are highly reproducible than contact technique. In clinical practice and in literature there are advantages of both contact and immersion techniques. The advantages of contact method are: convenience and speed, greater comfort, the patient may be lying or sitting and fewer instruments. The advantages of immersion method are: high reproducibility, no compression of the cornea and safer alignment in collaborative patients.

The great disadvantage of contact technique is corneal compression even with most experienced hands it is unavoidable. A useful method for minimizing errors is to compare the axial length with patient's refraction, corneal power (mean keratometry), anterior chamber depth and comparing the axial length of two eyes. The axial length is greater in myopic patients and shorter in hyperopic patients. Similarly, axial length may varies with the mean keratometry, as higher the corneal refractive power shorter will be the axial length and vice versa.[26] Significant compression can usually be detected by monitoring the anterior chamber depth. When the cornea is indented, anterior chamber depth decreases. This is true for eyes without any pathology.

The study conducted at Department of Ophthalmology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand showed that there is a clinical significant difference in intraocular power from both techniques; immersion technique gives better outcome than contact technique.[20] The study conducted at Applied Vision Research Centre, City University, London UK showed that spotlight or letter at 6m provides a suitable fixation target for biometry. Built-in fixation targets can produce significant errors.[21] The study conducted at Department of Ophthalmology, Royal Newcastle Hospital, Australia showed that immersion and contact biometry, both techniques give consistent results, but the difference between axial lengths measured by the two techniques has implications for choice of intra-ocular lens power.[22] The study conducted at Retina Service, Eye Bank Hospital of Porto Alegre, Brazil showed that the axial length obtained with immersion technique was longer than with contact technique.[23] The study conducted at Department of Ophthalmology, Cathay General Hospital, Taipei, Taiwan, Republic of China showed that axial length increases along with changes in the lens and anterior chamber depth during ocular accommodation.[24] The study conducted at Department of Ophthalmology and Optometry, University Hospital St. Anne, Brno showed that eye axial length gained by means of the immersion technique was longer than that obtained by the contact technique.[25] The study conducted at Center of Biophysics, Rensselaer Polytechnic Institute, Troy, NY, USA showed that corneal refractive power decreased significantly with increasing globe length in emmetropes.[26]

Keeping in view the above studies, the current study aims at finding the result of A-scan biometry contact technique in sitting and supine position with less erroneous readings and better outcome. This will help to provide better management of patients undergoing cataract surgery, by reducing postoperative refractive errors to achieve the desired postoperative emmetropia.

There might be another reason for shallow anterior chamber i.e. accommodation. According to the literature review changes in lens thickness and anterior chamber depth causes the erroneous axial length measurement.[24] Another study showed that spotlight or letter at 6m provides a suitable fixation target for biometry.[21] The patient can easily fixate at the distant target in supine position. Also the examiner can observe easily if there is any convergence or any movement of eyes, while the patient is in supine position. Proper alignment of sound beam along optical axis (visual axis) can be achieved in supine position. As there is comfort for both patient and examiner in supine position, corneal compression is less likely to occur, so biometry can be performed better in supine position than in sitting position.

The current study found a significant difference of axial length in sitting and supine position. The axial length obtained in supine position is longer than

axial length obtained in sitting position. This is due to less corneal compression, better distant target fixation and minimum accommodation. To eradicate corneal compression it is suggested to surgeons using contact method, to switch to the immersion technique. And immersion technique cannot be performed due to lid pathology or some other reason contact technique should be performed in supine position if attainable.

CONCLUSION:

Contact A-scan biometry performed in supine position yield longer axial length than performed in sitting position. The longer axial length was mainly the result of less corneal compression and distant target fixation. As patient comfortably fixates at distant target, this minimizes the accommodation and increases the anterior chamber and vitreous depth. This was concluded that contact a-scan biometry can be better performed in supine position.

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پرواز ہے دونوں کی اسی ایک فضا میں
کرگس کا جہاں اور ہے شاہین کا جہاں اور
اقبال

Atif Mansoor

ORIGINAL ARTICLE

Topical Nepafenac Vs Ketorolac for Maintenance of Intra-operative Mydriasis in Phacoemulsification

Atif Mansoor Ahmad FCPS, FRCS[1], Mohammad Saeed FCPS[2], Prof. M. Arshad Mahmood FCPS[3]

ABSTRACT

Purpose: To compare the efficacy of pre-operative use of topical nepafenac 0.1% and ketorolac 0.5% on maintaining mydriasis during phacoemulsification with foldable IOL implantation.

Material and Methods: This prospective, randomized and masked comparative study involving senile cataract patients given topical NSAIDs (nepafenac or ketorolac) or balanced electrolyte solution (control) prior to phacoemulsification. In all patients phacoemulsification was done with capsular bag intraocular-lens (IOL) implantation at Sheikh Zayed Hospital, Lahore. Horizontal and vertical diameters of pupil were measured at different stages of cataract surgery and the mean values were recorded.

Results: A total of 94 eyes of cataract surgery patients, 26 males and 68 females with a mean age of 68.36 ± 7.07 years, were included in the study. The mean horizontal and vertical diameters of the all groups were similar at the start of surgery. Significant differences were seen after IOL implantation, with the nepafenac group having the largest mean diameters in both horizontal and vertical pupil measurements.

Conclusion: Topical nepafenac has been shown to be a more effective in maintenance of mydriasis during phacoemulsification and provides a more stable mydriatic effect throughout the surgical procedure compared to topical ketorolac and placebo

INTRODUCTION

Phacoemulsification with intraocular-lens implantation is the current surgical treatment of choice for cataract extraction.[1-4] During cataract surgery, maintenance of mydriasis is necessary for better visualization of the posterior chamber which facilitate proper incision of the anterior capsule, safe removal of the cataract, and implantation of intraocular lens. To facilitate phacoemulsification and maintain intraoperative mydriasis topical mydriatics and NSAIDS are routinely applied preoperatively.[5] Our study compared the efficacy of two topical NSAIDs nepafenac 0.1% and ketorolac 0.5% in maintaining pupillary dilatation during phacoemulsification. We measured the horizontal and vertical pupillary diameters in 4 different stages of phacoemulsification; compared pupillary diameter measurements among the nepafenac, ketorolac, and placebo(B.E.S) groups; and determined the loss of intra operative mydriasis.

MATERIAL AND METHODS

We conducted a prospective, randomized, double-masked comparative study involving 94 eyes of patients diagnosed with cataract who underwent cataract surgery by phacoemulsification and capsular bag IOL implantation in a Sheikh Zaid hospital, Lahore from January to October 2013.

Inclusion criteria

- Patients with 40 years of age or older
- Cataract density (Nuclear sclerosis upto 3+)
- Cataract surgery by phaco-emulsification and capsular bag IOL implantation,
- Normal anterior segment and posterior segment exam otherwise.
- Uneventful phacoemulcification

The exclusion criteria

- Ocular inflammatory or infectious eye disease,
- Alterations of the ocular surface (e.g., dry eye),
- Previous ipsilateral ocular surgery or trauma,
- Ipsilateral neuro-ophthalmologic pathologies affecting pupil size
- Allergy or hypersensitivity to the preservatives, topical NSAIDs
- Use of topical or systemic medications including NSAIDs and steroids
- Diabetes mellitus with/without diabetic retinopathy and/or macular edema,
- Preoperative mydriasis less than 6 mm prior to the study,
- Phaco time of more than 15 minutes,
- Intraoperative complications
- Use of intraoperative intracameral adrenaline
- Inadequate mydriasis due to synechiae or iris atrophy

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Preoperatively, all subjects underwent a thorough ophthalmic examination. Past medical and surgical history, and use of concurrent medications were extensively reviewed. Best-corrected visual acuity (BCVA) using the Snellen chart, slit-lamp biomicroscopy, intraocular pressure by Goldmann applanation tonometry, and dilated fundus examination were done. A general surgical consent form and consent for using perioperative NSAIDs was obtained from all patients. Patients who underwent phacoemulsification were eligible for inclusion. They were randomly assigned to each of the 3 groups at the time of surgery. Patients received 1 drop of the assigned topical NSAID or balanced salt solution (BES) (control group) every 10-15 minutes for 4 doses to the operative site one hour prior to the scheduled operation. Five to ten minutes later, tropicamide 1% 1 drop every 10-15 minutes for 4 doses was instilled in all treatment groups. The surgeons and the patients were unaware of the type of test drops given. In all subjects a one-piece, monofocal, foldable acrylic IOL(Acrysof Single piece SN60.Alcon,USA) implantation inside the capsular bag after phacoemulsification under topical anesthesia (Proparacaine) was done by single senior ophthalmic surgeon. The surgeon used the same single handed Phaco flip technique for phacoemulsification. on all patients after making one 1-mm side-port, a 3.2-mm superior clear corneal incision, and a 5 mm continuous curvilinear capsulorhexis. Phacoemulsification parameters were established prior to all surgeries and were the same in all patients. Balanced electrolyte solution without epinephrine was used for irrigation. The corneal incisions were left unsutured after implantation of foldable intraocular lens (Acrysof single piece, Alcon, USA) in capsular bag in all cases.

To ensure the standardization of illumination during pupillary measurement, the surgeon used the same microscope (Muller Weidel). The illumination was kept constant (0.5 to 0.7) in all cases. The single surgeon measured the horizontal and vertical papillary diameters. A sterile caliper was placed over the cornea and measurements were taken, in millimeters, under the microscope at the following stages of surgery:

1) at the start of surgery
2) after phacoemulsification,
3) following cortex aspiration, and
4) after implantation of an acrylic foldable IOL with viscoelastic removal (Figure 1 A-D). The preset standard magnification (0,75x) of the operating microscope was ensured at each of the 4 time points. The primary outcome measures were the mean horizontal and vertical diameters of the pupil during the four different stages of phacoemulsification.

Other data collected were age, gender and the corresponding category to which they were assigned. Frequency, percentage, mean and standard deviation were used to describe demographic characteristics and values of pupillary measurements. Comparisons of categorical variables were analyzed using chi square t tests, where applicable. Analysis of variance (1 way ANOVA) was used to determine differences between groups at each stage of surgery, as well as changes from baseline. All analysis with $p<0.05$ considered as significant. Analyses were performed using Statistical Package for Social Sciences (SPSS) for Windows, version 10.0.

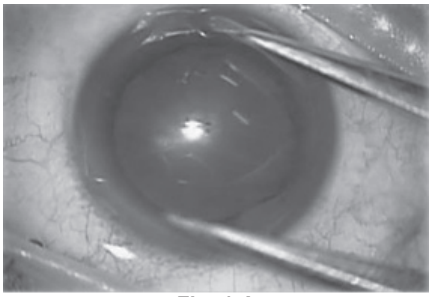

Fig: 1-A

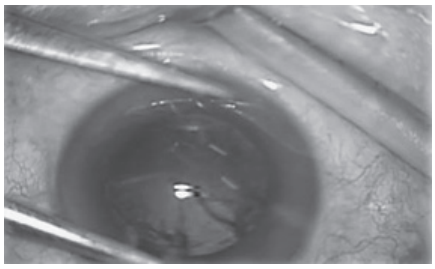

Fig: 1-B

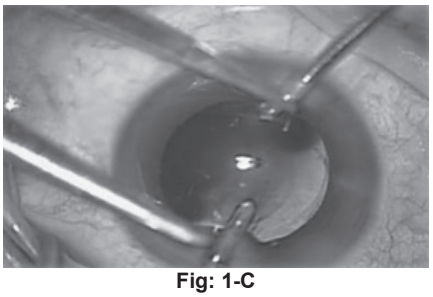

Fig: 1-C

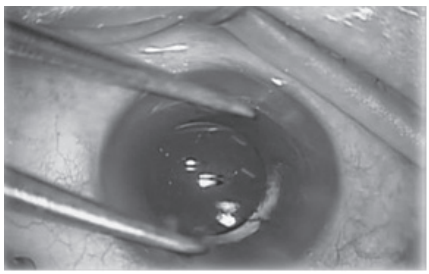

Fig: 1-D

Fig-1: Pupillary diameters at different stages of the surgery: At the start of surgery (A), after phaco emulsification (B), after cortical aspiration (C), and after intraocular-lens implantation and viscoelastic removal (D)

RESULTS

A total of 94 eyes of cataract patients, 26 males and 68 females, were included in the study. The mean age was 68.36 ± 7.07 years. There was no significant difference in age, gender, and laterality of eye operated on among the three groups (Table 1). Significant differences among the three groups were seen after IOL implantation, with the nepafenac group having the largest mean diameters in both horizontal (p = 0.01) and vertical (p = 0.01) pupil measurements (Tables 2 and 3).Comparison of total loss of mydriasis, which is the difference between pupil diameter before surgery and after IOL implantation, revealed significant differences in both horizontal (p > 0.05) and vertical (p > 0.05) pupil measurements with the nepafenac group having the least change from baseline. The Figure 1. Pupillary diameters at different stages of the surgery: At start of surgery (A), after phacoemulsification (B), after cortex removal (C), and after foldable intraocular-lens implantation and viscoelastic removal (D).

Table 1: Demographic profile of groups

Parameter	Groups			P-value
	Nepafenac n=28	Ketorolac n=36	Control n=30	
Age (years)	66.41±5.08	67.7± 11.91	64.4 ±7.8	0.6
Gender n %) Male Female	 8 (28.5) 20 (71.5)	 10 (27.85) 26 (72.15)	 8 (26.6) 22 (73.4)	1.00

DISCUSSION

The effectiveness of various topical Non- steroidal anti-inflammatory drugs (NSAIDs) in maintaining mydriasis during cataract surgery compared to placebo was shown in previous studies[6-9] Coste showed that nepafenac given 3 times a day 1 day before cataract surgery was superior to tobramycin dexamethasone eye drops in maintaining intraoperative mydriasis measured at 4 different stages of the surgery. Prostaglandins play an important role in surgically-induced miosis NSAIDs inhibit prostaglandin production; hence, providing both analgesic and anti-inflammatory activities.[6] Solomon[7] compared the effects of topical 0.5% ketorolac tromethamine ophthalmic solution with topical 0.03% flurbiprofen sodium on the inhibition of surgically induced miosis during phacoemulsification. Ketorolac provided a more stable mydriatic effect throughout the surgical procedure. Ophthalmic NSAIDs are used to decrease the various changes brought about by intraocular surgeries. Mechanical ocular trauma from phacoemulsification can cause conjunctival hyperemia, inflammation, pain, cystoid macular edema, breakdown of the blood–aqueous barrier, rise in intraocular pressure, and most especially surgically-induced miosis creating access for cataract removal difficult.[8-9] Topical NSAIDS minimise systemic absorption. Newer topical NSAIDs also showed similar favorable effects. Topical Nepafenac 0.1%, , is subsequently converted by ocular tissue hydrolases to amfenac, which is thought to inhibit the action of the cyclooxygenase prostaglandin H synthase.[10] In our study Nepafenac 0.1% show advantage over the ketorolac group in terms of maintaining mydriasis during phacoemulsification. In addition, nepafenac 0.1% has also shown to be more effective than placebo at maintaining mydriasis at every stage of the surgery.

Table 2: Mean vertical diameter of pupil at different stages of phacoemulsification

Surgery stages	Groups			P-value
	Nepafenac (mm)	Ketorolac (mm)	Control (mm)	
At start of surgery (mean ± SD)	8.15 ± 0.9	8.23 ± 1.38	8.19 ± 0.7	0.9
After phacoemulsification of nucleus mean ± SD Change from base line	7.34 ± 0.8 -0.81 ± 0.59	6.93 ± 1.23 -1.30±0.9	7.03 ± 1.03 1.16 ±0.7	0.41 0.3
After aspiration of cortex (mean ± SD) Change from base line	6.98±0.98 -1.17 ±0.8	6.36 ±1.05 -1.87±0.89	6.44 ± 1.03 1.75±0.6	0.2 0.09
After IOL implantation (Mean ± SD) Change from base line (Total loss of Mydriasis %)	6.76 ±1.15 -1.39±0.91	5.98±1.17 -2.25±0.7	5.86±0.8 -2.33±1.03	0.01 0.008

Table 3: Mean Horizontal pupil diameter at different stage of phacoemulsification

Surgery stages	Groups			P-value
	Nepafenac (mm)	Ketorolac (mm)	Control (mm)	
At start of surgery (mean ± SD)	8.29±1.09	8.22 ±0.9	8.26±1.03	0.9
After phacoemulsification of nucleus mean ± SD Change from base line	7.44±1.32 -0.85±0.98	6.81±1.02 -1.41±1.06	6.84±0.83 -1.42±0.69	0.3 0.15
After aspiration of cortex (mean ± SD) Change from base line	7.12±1.08 -1.17±0.9	6.75±0.89 -1.47±1.07	6.28±1.06 -1.98±1.12	0.2 0.6
After IOL implantation (Mean ± SD) Change from base line (Total loss of Mydriasis%)	6.86±1.19 -1.43±0.89	5.84±0.96 -2.38±0.64	5.78±0.79 -2.48±0.91	0.01 0.006

Previous studies have established the effectiveness of ketorolac 0.5% for the treatment of both pain and inflammation following cataract surgery.[11] Most interesting, however, is the comparison between nepafenac 0.1% and ketorolac 0.5%. In our study, topical nepafenac 0.1% reached statistical superiority compared to topical ketorolac 0.5% in all four stages of phacoemulsification. Nepafenac has been shown to penetrate the cornea rapidly and provides a complete and longer-lasting inhibition of prostaglandin synthesis and vascular permeability.[12] Perhaps, this advantage in absorption and bioavailability was the reason behind its superiority in maintenance of mydriasis seen in this study. All surgeries by single consultant surgeon, limiting phaco time and prescribing a consistent technique as well as dictating microscope illumination minimized the confounding effects during our study.

CONCLUSION

Topical nepafenac 0.1% has been shown to be a more effective in maintaining intraoperative mydriasis during phaco-emulsification with IOL implantation compared with topical ketorolac or balanced electrolyte solution.

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Mubashir Rehman

ORIGINAL ARTICLE

Visual Outcome after Extra-Capsular Cataract Extraction with Intraocular Lens Implantation of Patients with Age Related Cataract

Mubashir Rehman FCPS[1], Asim Ali Shah FCPS[2]
Mohammad Zeeshan Tahir FCPS[3], Imran Ahmad FCPS[4], Asif Iqbal MBBS[5]

ABSTRACT:

Objective: To determine the frequency of visual outcome of patients having extra-capsular cataract extraction with intraocular lens implantation of patients with age related cataract.

Study design: Prospective, descriptive study.

Place and duration of study: The study was conducted from April 2010 to October 2010 at Eye Department Lady Reading Hospital Peshawar.

Patients and methods: All patients were selected on the basis of diagnostic criteria having age related cataract from out-patient department. All patients underwent extra-capsular cataract extraction with intraocular lens implantation surgery by a 4th year ophthalmology resident. After surgery patients were examined on 1st post-operative day. Follow up visits were on 10th day, one month and two months post-operatively. At each visit visual outcome was assessed as good, borderline or poor on the basis of visual acuity detected on Snellen's visual acuity chart followed by refraction for best corrected visual acuity.

Results: A total of 151 patients were studied in this study. Mean age was 43 years with standard deviation as ±12.3. Of 151 patients, n=68(45%) were males and n=83(55%) were females. The uncorrected post-operative visual acuity was 6/18 or better in n=74(49%), while 77(51%) patients had low vision (<6/18). However, the final corrected post-operative visual acuity was 6/18 or better in n=98(64%) of the patients, and in n=53(35%) patients it was found to be low (<6/18). 68 (45%) patients out of 151 cases were bilaterally blind, i.e pre-operative VA of less than 3/60 in the better eye. Of these, the final uncorrected post-operative visual acuity was 6/60 or better in n=56(37.3%), and the final corrected visual acuity was 6/60 or better in n=57(37.7%) of patients. Of the 50 patients who were blind pre-operatively, n=49(98%) reported some form of visual improvement. Twenty eight (63.6%) patients reported inability to work without assistance pre-operatively but only n=1(2.3%) needed assistance to work post-operatively.

Conclusion: The visual outcome of the cataract surgical campaign was gratifying both from the patient's and physician's point of view. We recommend that future cataract surgical campaigns should consider extra-capsular cataract extraction with PC IOL insertion as their surgical procedure.

INTRODUCTION

Cataract is a lens opacity, partial or complete, of one or both eyes, impairing vision. Many causes of cataract are classified by their morphology like size, shape, location or etiology. Age related cataract is the one related with old age.[1] Cataract remains the leading cause of blindness worldwide, resulting in nearly half (47.8%) of all blindness cases.[2] Cataract is also the most common cause of blindness (51.5%) in Pakistan.[3,4] In a survey conducted in Pakistan the prevalence of age related cataract is 20.9%.[5]

Definitive management of age related cataract is lens extraction. Extra-capsular cataract extraction surgery is relatively simple and straight forward to learn without investment in expensive equipment compared to other surgical procedures like phacoemulcification and is till done in developing countries as primary surgical procedure for cataract.[1] Very few studies have been conducted regarding visual outcome after extra-capsular cataract extraction. The only survey in Pakistan which was population based showed that 35.6% of the patients have visual acuity less than 6/18 to 6/60, 8.7% have visual acuity less than 6/60 and 55% have visual acuity better than 6/18 in operated eye which can be halved by appropriate refractive correction.[6] In a developing country extra-capsular cataract extraction is main treatment for age related cataract and main cause of poor visual outcome is surgical complication. Using appropriate surgical techniques and standardized protocols do not compromise visual outcome of extra-capsular cataract extraction surgery.[7]

As a matter of fact extra-capsular cataract surgery constitutes bulk of surgical procedures for managing age related cataract in eye unit, Lady Reading Hospital Peshawar. The study was aimed to determine the standard of surgery at our setup and to see whether it is comparable to international study outcome. The benefit and yield of this study will be to improve and look at the reasons for poor visual outcome.

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Study design: Prospective, descriptive study.

METHODS

The study was conducted at eye unit Lady Reading Hospital Peshawar. An informed written consent was obtained from patients. The study sample was collected from Ophthalmology out-patient department in Lady Reading Hospital, Peshawar.

All cases with age related cataracts were identified by the researcher after detailed history and ocular examination including visual acuity on Snellen's chart, slit lap examination, intraocular pressure and fundus examination. Consecutive cases that satisfy the inclusion and exclusion criteria were included.

After admission, patients underwent extra-capsular cataract extraction surgery by 4th year ophthalmology residents. After surgery patients were assessed on 1st post-operative day and were put on Dexamethasone and Tobramycin combination eye drops. Patients were then examined on 10th day, one month and two months post-operatively. At each visit visual outcome was assessed as good, borderline or poor on the basis of visual acuity detected on Snellen's visual acuity chart followed by refraction for best corrected visual acuity. All analysis was done in SPSS 13.0. Frequencies and percentages were calculated for categorical variables like gender and type of age related cataract, while mean and standard deviation was computed for numerical variables like age.

Operational definition: **Visual outcome:** of patients at 1st, 10th, one month and two months post-operatively after extra-capsular cataract extraction using Snellen's chart followed by refraction for best corrected visual acuity and was classified as:

1. Good VA : 6/18 or better.
2. Borderline VA: less than 6/18 to 6/60.
3. Poor VA: worse than 6/60.

RESULTS

A total of 151 patients were studied in this study which was conducted at "Eye department" Lady Reading Hospital, Peshawar. Age distribution was analyzed as n=76 (50%) patients were in age group 40-50 years, n=60 (40%) patients were in age group 51-60 years, n=15 (10%) patients were in age group >60 years. Mean age was 43 years with standard deviation as ±12.3 (table 1). Gender distribution was analyzed as n=68(45%) of 151 patients were males and n=83(55%) were females. The IOL power implanted ranged from 19 to 24 diopters.

The uncorrected post-operative VA of 151 patients was 6/18 or better in n=74(49%), while 77(51%) patients had low vision (<6/18) as seen in table No 2. However the final corrected post-operative visual acuity was 6/18 or better in n=98(64%) of patients, and in n=53(35%) patients it was found to be low (<6/18) (as shown in table No 2).

Table-1: Age distribution (N=151)

AGE DISTRIBUTION	FREQUENCY	PERCENTAGE
40-50 Years	76	50%
51-60 Years	60	40%
>60 Years	15	10%
Total	151	100%

Table-2: Visual outcome of patients operated n=151

VISUAL OUTCOME	WITHOUT CORRECTION	WITH PIN HOLE
>6/18	74(49%)	98(64%)
6/24-6/60	60(39%)	40(26%)
<6/60	17(12%)	13(10%)
TOTAL	151(100%)	151(100%)

Table-3: Reasons for post-operative visual acuity <6/60 (n=151)

Complications	Frequency	Percentage
PCO	2	1.33%
Corneal edema	1	0.6%
Retinal detachment	1	0.6%
Pupillary fibrinous material	2	1.33%
Optic atrophy	1	0.6%
Macular degeneration	4	2.65%
Proliferative diabetic retinopathy	2	1.33%
Cortical remnant	5	3.32%
Uveitis	13	8.61%
Unknown	8	5.30%

Several post-operative complications were noted. The most severe ones were wound gapping and secondary glaucoma. One case (0.6%) of wound gapping required second surgery. Secondary glaucoma occurred in n=2(1.3%) patients, with one patient requiring filtration surgery. Visually significant posterior capsular opacification (PCO) was seen in n=10(6%) of patients.

Factors that contributed to a corrected visual acuity of <6/60 was specifically sought for and it is presented in table 3. Sixty eight (45%) patients of 151 cases were bilaterally blind, i.e. pre-operative VA of less than 3/60 in better eye. Of these, the final uncorrected post-operative VA was 6/60 or better in n=56(37.3%), and the final corrected VA was 6/60 or better in n=57(37.7%) of patients.

In general, patient's responses regarding their post-operative visual outcome were positive. When asked how well they saw compared to their pre-opera-

tive state, n=84(55.6%) of patients reported marked improvement while n=61(40.3%) reported slight improvement of vision. Three (1.9%) cases said that their vision remained the same and another n=3(1.9%) reported further reduction of vision.

Of the 50 patients who were blind pre-operatively n=49 (98%) reported some form of visual improvement. Twenty eight (63.6%) patients reported inability to work without assistance pre-operatively but only n=1 (2.3%) needed assistant to work post-operatively.

DISCUSSION

Regular follow up of patients, like in other under developed countries, is a problem in our country too. Drop out from consecutive follow up is common and it increases with increased duration. The long distance travel as well as the cost of this travel is said to be the major factor for terminating successive visits.[8,9,10] In our study, 151(81.3%) patients had two months of follow up which was comparable to other similar studies.[8,9,11,12]

The visual results are similar to other studies. Seventy-four (42.5%) patients had uncorrected VA of 6/18 or better and 145 (83.3%) patients had uncorrected VA of 6/60 or better. However, corrected VA was 6/18 or better in 109 (63.0%) of patients and 6/60 or better in 149 (85.6%) of patients. In a study done in Nepal uncorrected VA of 6/18 or better was seen in 47.9% of cases while corrected VA of 6/18 or better was seen in 77.4% of cases.[13] We feel that the number of cases with corrected VA worse than 6/60 could have been reduced if some of the patients with pre-existing problems other than cataract that decreased their post-operative VA were screened out. The fact that intraocular complications were not documented during surgery, limits the article in this regard. Unlike some other studies,[14,15,16] not a single case of endophthalmitis was seen in this study.

With the high volume of surgery that was carried out during the 5 days of the campaign, this is very assuring. Visually significant posterior capsular opacity (PCO) was found in 9 (5.17%) patients, which was comparable to another study conducted over a similar period of time.[13] This relatively lower rate of PCO could be explained by the fact that most of the patients had mature cataract pre-operatively, which is believed to reduce its rate.[17] In addition, the follow-up time was short to reveal all patients who were likely to develop this complication.

Intraocular pressure was not measured with tonometer in all patients due to logistics and time limitation. This might have picked more cases of glaucoma post-operatively. Post-operative findings of remnant cortical material and uveitis rate was slightly higher than other studies[18] but this can be corrected by increasing meticulousness during the surgical procedure. Viscoelastic materials were used for the insertion of IOL in all cases. We advocate that viscoelastic material be used in cases of extra-capsular cataract extraction with posterior chamber intraocular lens implantation.

The visual outcome of cataract surgery with posterior chamber lens implantation performed during the campaign was gratifying both from patients as well as ophthalmologist's point of view. The questionnaire also indicated good patient's satisfaction with the results achieved. Even though several eye camp cataract operations were done in Ethiopia previously using the intra-capsular cataract extraction (ICCE) method, there was no available report about the outcome of this procedure for comparison. In line with the report that uncorrected aphakia is an important cause of blindness in Africa,[19,20,21] the visual outcome of cataract surgery with intraocular lens implantation seen in our study was very encouraging to consider it in the future.

CONCLUSION

The visual outcome of the cataract surgical campaign was gratifying both from patient's and physician's point of view. The study showed that eye camp surgeries involving extra-capsular cataract extraction with posterior chamber intra-ocular lens are feasible. We recommend that future cataract surgical campaigns should consider using ECCE with PC IOL insertion as their surgical procedure.

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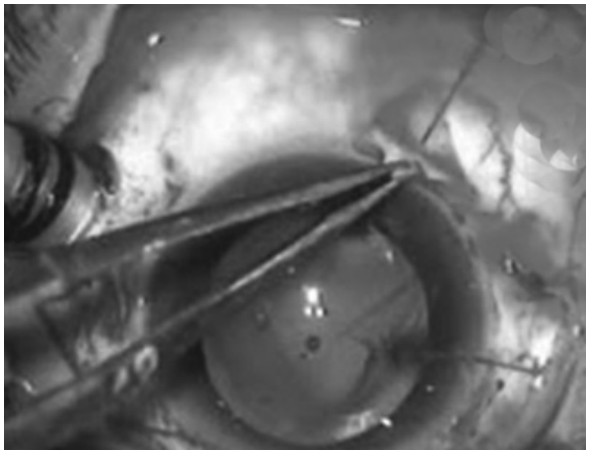

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(Newsnet-online)

Bilal Bashir

ORIGINAL ARTICLE

Frequency of Posterior Capsular Opacification with Acrylic Lenses in Pediatric Age Group & Congenital Cataract Surgeries

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Abstract

Objectives: The objective of the study is to determine frequency of posterior capsular opacification (PCO) in congenital cataract surgeries performed in pediatric age group using acrylic hydrophobic lenses.

Material and Methods: This retrospective observational case series study was carried out in Eye unit of Lady Reading Hospital Peshawar in the year 2012. A total of 40 consecutive eyes having congenital cataract surgery with acrylic hydrophobic lens implantation were observed after three ,six and twelve months of follow up for the development of posterior capsular opacification.

Results: Mean age group in this study was 4 years with standard deviation of ±11.3. Male patients were 25 (62.5%) and female patients were 15 (37.5%).Visually significant PCO was found in 2(5 %) patients at one month follow up. After three months 4 (10%) patients had PCO and after six months further 4 (10%) patients had visually significant PCO.

Conclusion: Incidence of PCO formation is less with acrylic hydrophobic lenses in our set up and are recommended for congenital cataract surgery in pediatric age group.

Keywords: Posterior capsular opacification, congenital cataract, acrylic lenses.

INTRODUCTION

Congenital cataracts occur in about 3-15: 10,000 live births. Two-third of the cases are bilateral. The cause of cataract can be identified in about half of the cases with bilateral opacities.[1] Unilateral cataracts are usually isolated sporadic incidents. They can be associated with ocular abnormalities (e.g., posterior lenticonus, persistent hyperplastic primary vitreous, anterior segment dysgenesis, posterior pole tumors), trauma, or intrauterine infection, particularly rubella.

Bilateral cataracts are often inherited and associated with other diseases. They require a full metabolic, infectious, systemic, and genetic workup. The common causes are hypoglycemia, trisomy (eg, Down, Edward, and Patau syndromes), myotonic dystrophy, infectious diseases (eg, toxoplasmosis, rubella, cytomegalovirus, and herpes simplex [TORCH]), and prematurity. In most cases surgical treatment of cataract is indicated. This includes lens aspiration with or without intraocular lens (IOL) implantation. If IOL is used then acrylic posterior chamber IOL are preferred intraocular lenses (IOLs) for children.[2,3] Acrylic IOLs are flexible which can be folded and inserted through much smaller incision.

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Although there are many complications of pediatric cataract surgery with IOL but posterior capsular opacification (PCO) is the most frequent complication of pediatric cataract surgery.[5] A local study showed that about 51.72% of paediatric patients developed PCO after cataract surger. PCO formation can cause reduced visual acuity and amblyopia in children.[7] The objective of the study was to determine the frequency of posterior capsular opacification in paediatric cataract surgery with acrylic hydrophobic posterior chamber lenses.

MATERIAL AND METHODS

This was a retrospective case series study carried out in Eye unit of PGMI / Lady Reading Hospital, Peshawar in year 2012.The study included 40 consecutive pediatric eyes having congenital cataract. The study sample size was calculated by using 90% confidence co-efficient, 21% prevalence of PCO with acrylic , with 5% level of significance.

Inclusion criteria: Congenital cataract in both sexes with intact posterior capsule

***Exclusion criteria*:**

- All children who were less than 2 years
- All patients with complicated cataracts such as drug induced or radiation induced and traumatic cataract.

Patients were enrolled in the study who were admitted in Eye department o PGMI Lady Reading Hospital Peshawar. Approval from hospital ethical committee and written informed consents were taken from parents of patient for inclusion in the study. All patients were operated by the same surgeon in order

to obviate surgeons' bias. After giving superior limbal incision lens aspiration was done followed by posterior capsulotomy and anterior vitrectomy. Acrylic IOL were implanted through injector or by holding folding forceps. Where necessary one or two Nylon 10/0 stitches were applied at limbus.

Complete history and ocular examination was done. Un-cooperative patients were examined under general anesthesia using portable slit lamp. After surgery patients were monitored for the PCO formation during the follow up period after one month, 3 months and 6 months postoperatively. Being biased was controlled by strictly following the inclusion and exclusion criterion .Data was entered into proforma. All the data was analyzed in SPSS 10. Frequency and percentages were computed for all the qualitative variables like gender, type of procedure, type of cataract and complication like posterior capsular opacification. Mean and standard deviation was calculated for quantitative variable like age. P value < 0.05 was considered as significant value.

RESULTS

Out of 40 patients 25 (62.5%) were male and 15(37.5%) were female. A total of 10 (25%) patients developed PCO at the end of the study. There was PCO formation in 2 patients (5%) at one month of follow up. At third month of follow up 4 new patients (10%) developed PCO. At sixth month of follow up 4 patients (10%) developed PCO. Among all 10 patients 8(80%) patients were male and 2 (20%) were female.

Tab-1: Number of patients according to Age distribution

Age Distribution	No of Patients
2- 5 Years	18
6-10 Years	12
11-17 Years	10
Total	40

Tab-2: PCO formation according to the age group

Age Group	PCO formation
2- 5 Years	6 (60%)
6-10 Years	3 (30%)
11-17 Years	1(10%)
Total	10

Tab-3: PCO status after one, three and six month of follow up

Follow up	PCO Formation
One month	2 (5%)
Three months	4 (10%)
Six months	4 (10%)
Total	10 (25%)

DISCUSSION

This study was conducted on 40 eyes in order to find out the frequency of postoperative complication of posterior capsular opacification in paediatric cataract surgery with acrylic hydrophobic posterior chamber lenses. Our study shown that the occurrence of PCO is more in age range 2-5 years because most of the patients 60% were in age group 2-5 years. Similar results were found in a study done by Lambert SR.[8]

Our study shows that the incidence of PCO is slightly higher in male children's as compare to female patients as majority of the patients were male (25).Similar results were found in a study done by Lambert SR and Knight Nanan D.[8,9]

Moreover the management of PCO in a child is difficult. The efficacy of Nd: YAG laser capsulotomy in the pediatric population, largely depends upon the density of the membrane and the cooperation of the child. Buckley EG[10] Complications like retinal detachment, cystoid macular edema and glaucoma, are known to occur in adults.[10] Longer follow up of pseudophakic children who have undergone Nd:YAG laser capsulotomy is required to evaluate the long term effects. Also, recurrence of opacification of visual axis has been noted following Nd: YAG capsulotomy in young children.[10]

Thus prevention of PCO is desirable. In children, modifications in the surgical technique have been described. These involve creating an opening in the PC and a limited Anterior vitrectomy or optic capture.[11] Posterior capsulorhexsis with anterior vitrectomy is associated with IOL dislocation (3-20%) and cystoid macular edema.[11] There is always a risk of retinal detachment if vitreous is incarcerated in the wound. A pars plana membranectomy may be needed, if the visual axis is occluded by secondary membranes.[12] Optic capture provides better IOL centration, but tends to predispose to an increased uveal inflammatory responses and is technically more demanding. Opacification of the visual axis has been reported following optic capture without anterior vitrectomy.[12]

The design of intraocular lens can reduce the incidence of PCO.[12,13] Similarly IOL manufacturing may play an important in reducing PCO. In a study by Tromans[14] 11.75% adult patients with acrylic lenses developed PCO, compared to 43.65% and 33.5% with PMMA and silicone lenses, respectively. Various other studies have shown that there is a significantly greater adhesion of the capsule to acrylic IOL. So far we don't know the exact mechanism by which the IOL material influences the behavior of these cells. Some studies have claimed that the acrylic IOL may have bioactive properties. [14]

Not many studies have been done in pediatric eyes to determine the visual acuity in children. Only 2 studies describe the outcome in children.[15] Incidence of PCO was higher with the PMMA lens, than with acrylic or the silicone IOL. Acrylic IOLs are therefore more biocompatible in pediatric eyes. Study conducted by NG DT and Plager DA[16,17] demonstrated that none of the patients with acrylic IOLs needed a Nd:YAG laser capsulotomy, compared to 26% with PMMA and 14% with silicone IOLs at 3 year follow up.

In our own study which compared PCO formation in acrylic hydrophobic lenses versus Polymethyl methacrylate group ,the incidence of clinically significant PCO was 11.53% in the group with acrylic IOLs.[23] In the group with PMMA IOLs, 11 (42.3%) eyes developed a PCO, which was obscuring vision. Kaplan Meier curves distinctly demonstrate that in patients with acrylic IOLs, the posterior capsule remained clearer for a greater period of time, compared to the group with PMMA IOLs. In patients over 4 years old, with more than 2 years follow up, the incidence of visually significant PCO following acrylic IOL implantation, was 50% (13 of 26 eyes).[11] In another study comparing 2 groups with acrylic and PMMA IOLs implanted, there were less complications in the group with acrylic IOLS, though there was no difference in the incidence of PCO between groups.[13] Our data show that in pediatric eyes with acrylic IOLs implanted have lower incidence of clinically significant PCO. Acrylic IOLs have a higher degree of biocompatibility in the eye, as evidenced by the lesser amount of cellular reaction on the IOL surface and may have a role to play in those patients with a breach in blood-aqueous barrier. A significant finding amongst our patients was that, none of the eyes with an acrylic IOL experienced any postoperative uveal inflammation. Thus the IOL biocompatibility, associated uveal inflammation and development of PCO, are inter-related. However, the long-term effects of acrylic IOLs in children whose life expectancy is much more, are yet to be assessed. In adults, acrylic IOLs have been in use for less than a decade. They appear to induce less inflammatory reaction in the eye, compared to PMMA IOLs.[15] Similar results have been reported earlier in children.[17] Thus, in those patients in whom the intra-ocular inflammation is expected to be greater, particularly in younger age group, acrylic lenses may be preferred.

It may be argued that the straight edge of the acrylic IOL optic may be responsible for the reduced incidence of PCO, since this is advantageous in IOLs of other materials too.[8] A comparative study between straight and rounded edge acrylic IOLs is needed to determine the effect of a difference in the IOL design. Some major limitations of this study was the small sample size, short duration of study follow up period and lack of randomization. However, the acrylic IOLs can be safely implanted in children undergoing cataract surgery with less incidence of PCO. Further studies are recommended in this regard.[11,16]

In the presence of a glare source, phakic eyes had less decrease in visual acuity ($P<0.05$). Although not as good as the phakic group, the results in the acrylic group were significantly better than the PMMA group ($P<0.05$). In the present study, PCO was more common in the PMMA IOL-implanted group, however, the difference was statistically insignificant ($P>0.05$). Similarly, acrylic lenses are reported to result in PCO, although less frequent than PMMA lenses, with a significant difference.[18,19,20] Although the difference for mild PCO was insignificant between the PMMA and acrylic IOL groups in this study, the high glare disability and contrast sensitivity in the PMMA group might be the result of this insignificant high incidence of mild PCOs. Campbell MJ et al[20] also suggested a correlation between the amount of PCO and glare score.

CONCLUSION

Our study shows that acrylic hydrophobic IOLs are safe in pediatric eyes can reduce statistically significant posterior capsular opacification. We have the opinion that close follow up is required in pediatric eyes undergoing cataract surgery to prevent amblyopia due to PCO which can be refractory to treatment.

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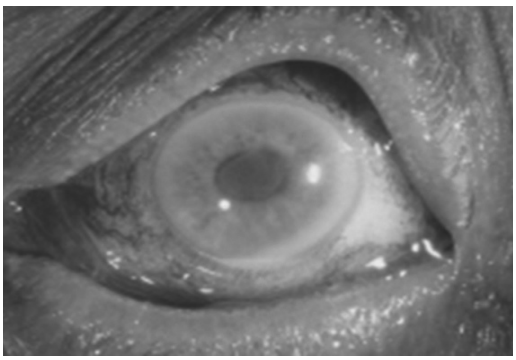
Toxic anterior segment syndrome (TASS)



Toxic anterior segment syndrome (TASS) is an acute postoperative inflammatory reaction in which a noninfectious substance enters the anterior segment and induces toxic damage to the intraocular tissues. Almost all cases occurred after uneventful cataract surgery, and, more recently, it has been reported after phakic intraocular lens implantation. Previously, this syndrome was defined by many names, such as sterile endophthalmitis or postoperative uveitis of unknown cause. Furthermore, a condition termed toxic endothelial cell destruction (TECD) syndrome has been described and is now believed to be a variant of TASS. Diffuse limbus-to-limbus corneal edema and anterior segment inflammation noted in a patient with toxic anterior segment syndrome (TASS).

(Newsnet-online)


Syed S. Hasnain

SHORT COMMUNICATION

Are we on Right Path in Glaucoma? Hypothesis of Modern Concept - A Discussion

Syed S. Hasnain MD[1], Sikandra Hasnain BA[2]

INTRODUCTION

Glaucoma is defined as an optic disc neuropathy, which is a broad umbrella term encompassing various optic disc neuropathies in which nerve fibers are atrophied. However, there are distinctive morphological and histological differences in glaucomatous disc and non-glaucomatous optic atrophies. In this case, we question why there are distinctive differences in the glaucomatous discs and non-glaucomatous optic atrophies such as that found in multiple sclerosis?

DISCUSSION

There are a few misconceptions that we would like to address in the context of two established facts in glaucoma. First, the nerve fibers in glaucoma are always destroyed in an orderly fashion, from peripheral to central, never haphazardly or other way around. Second, the histology of a normal optic disc is densely packed with nerve fibers in contrast to end-stage glaucomatous disc, which depicts an empty crater devoid of nerve fibers and vasculature. These two aforementioned facts would be the focus of our discussion in this article.

What is cupping of the optic disc?

Historical Background After the invention of the ophthalmoscope in 1851 by Helmholtz, the ophthalmologists found that the optic discs of simple glaucoma patients, most likely in their end-stage, had turned into the shape of a cup and were thus named as a ***cupped disc.***

In a way these ophthalmologists were correct as the optic discs, instead of being normally flat, had assumed the shape of a cup that they attributed to be resulting from the increased force of high IOP. To their credit, the ophthalmologists of 1850s were using candles to illuminate the fundus and the knowledge of glaucoma was in its infancy. The phenomenon of cupping was given by anatomist Heinrich Muller and endorsed by the prominent ophthalmologists of the time such as Von Graefe, Weber, Jaeger and others.[1]

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Instead of questioning the authenticity of cupping, the term cup/disc ratio was introduced which gave further credence to the cupping theory. Since then, the cup/disc ratio terminology has become the standard for diagnosing and documenting the progression of glaucoma across the globe. In this article we will discuss whether cupping is occurring or not in the glaucomatous disc and further evaluate what may be occurring.

What are the physiological cups of the optic disc?

Physiological cups of various sizes and shapes are produced due to varying degree of atrophy of Bergmeister's papilla, which supplies nutrition to the lens in fetal life.[2] This vestigial tissue is identified as central connective tissue meniscus (CCTM), lying superficially on the surface of the nerve fibers layer. The size of CCTM determines the base of physiological cups from 0.9 to none if no such vestigial tissue is present. Thus, the physiological cup is a remnant fibrous tissue, which is not an integral part of nervous tissue[3] and appears wrongly implicated in glaucoma.

Is the optic disc really cupping in glaucoma? Unlikely, according to the arrangement of nerve fibers in the retina and optic disc, the nerve fibers originating furthest from the optic disc lie deepest and exit closest to the scleral edge, whereas nerve fibers originating closest to the disc lie most superficial (closest to vitreous) and exit from the central most part of the disc.[4] If cupping were occurring, then the central most fibers, which are also most superficial, should be destroyed first, resulting in concentric enlargement of a blind spot followed soon by a total engulfment of the macular fibers and thus total loss of central vision (immediate blindness) and the peripheral vision fibers would be the last to go.

In actuality it is other way around as the peripheral fibers are destroyed first while the central fibers are destroyed last until the end-stage of glaucoma. In other words, the glaucomatous field defects contradict the phenomenon of cupping entirely. The aforementioned notion alone should be enough to reject the cupping theory.

Is the cupped area is empty of nerve fibers? Unlikely, it is widely published that the cupped area is empty and the nerve fibers are present only in "neuroretinal rim". It is hard to comprehend that in a 0.8 physiological cup,

a million or so nerve fibers would only be present in 20% of the neuroretinal rim and central 80% of disc/LC would have empty hole or filled with non-neuronal tissue. We believe this is a misconception as there is no histology available to support such a doughnut shaped arrangement of nerve fibers in any disc, glaucomatous or otherwise.

The so called "neuroretinal rim" is in fact the exposed area of the nerve fibers uncovered by the vestigial tissue. If we examine the histology of a normal disc we will find that nerve fibers are present underneath this vestigial tissue (CCTM) as well.[3] Some researchers believe that cup/disc ratio's are not accurate but instead recommend using rim/disc ratios. We believe both concepts are two faces of same coin. Either we can sell a doughnut by the size of its hole or by the width of its rim. Both scenarios convey the message of cupping that may not be occurring at all in the glaucoma.

Is the Lamina Cribrosa really bowing posteriorly (cupping) in glaucoma? Unlikely, it is commonly believed that the Lamina Cribrosa (LC) is bowing posteriorly, or in other words 'cupping,' due to raised IOP and even normal IOP in NTGs. If the central cupped area is an empty hole in LC, then how can a holed LC bow posteriorly? Moreover, it is difficult to convince that a multilayered rigid connective tissue sieved plate (LC) would start bowing posteriorly with a rise of only 10 or 15 mmHg of IOP above the upper limit of its normal range (10 to 21) yet LC wouldn't bow posteriorly in cases of acute glaucomas where IOP goes to 60mmHg and above? There is no acute cupping occurring in acute glaucoma. Most importantly, there is no histology available supporting the posterior bowing of LC in any glaucomatous stage, only the schematic diagrams of bowing LC presented textbooks.

Is the raised IOP/ischemia directly destroying the Nerve fibers? Unlikely, the million or so nerve fibers densely packed in the optic disc are always being destroyed in an orderly fashion from peripheral to central fibers. It is inconceivable that raised IOP, ischemia, neuro-degeneration or in fact any pathology acting directly will always destroy the nerve fibers or their RGCs from peripheral to central in an orderly fashion and not randomly.

Puzzling question:

If the raised IOP, ischemia, or any other pathology acting directly can't destroy the nerve fibers or their RGCs in an orderly fashion, then why are the nerve fibers always being destroyed in an orderly fashion in glaucoma?

We hypothesize that there has to be some *indirect* mechanism leading to the orderly destruction of nerve fibers even though that orderly mechanism may have resulted from raised IOP or due to some other pathology.

What may be the indirect mechanism? We propose that optic disc/LC is sinking in glaucoma due to atrophy of the border tissue of Elschnig (BT). BT is solely supplied with ciliary circulation, which is of lower pressure compared to the retinal circulation. Systemic circulatory pressure supplying the BT and IOP are opposing forces. Normally the circulatory pressure supplying the BT should be higher then the IOP for the proper perfusion and healthy maintenance of BT. However if this delicate balance is reversed, either due to raised IOP or due to decreased systemic pressure, even the normal level IOP can take the upper hand and thus slowly compress and chronically starve the circulation of the BT inducing chronic ischemia and its atrophy. Due to atrophy of the BT the LC will start sinking resulting in prelaminar nerve fibers being stretched then broken.

In addition to border tissue, the 360 degrees of nerve fibers also anchor the LC as roots anchor a tree. Thus, the severance of nerve fibers leads to further disc sinking. The cascade of severance of the nerve fibers and sinking disc would become self- propagated and continue until all the nerve fibers are severed.

Do we have proof for sinking disc? EDI-SD-OCT has revealed sliding posteriorly of LC from the initial stages of glaucoma[5,6] supporting the fact that LC has detached and exhibits sinking in the scleral canal.

Do we have proof for severance of nerve fiber? We believe there is ample evidence that the nerve fibers are severed and not atrophied in glaucoma in the following discussion.

Occurrence of excavation in the glaucomatous disc. The apparent 'cupping' of the disc is in fact excavation (empty spaces) occurring in the glaucomatous disc resulting from severance of the nerve fibers. Excavation of disc and severance of the nerve fibers are unique features of glaucoma. In the non-glaucomatous optic atrophies the disc remains flat (non-excavated) as the nerve fibers in such conditions are truly being atrophied, not severed. The fibrous physiological cups are not truly enlarging but being disintegrated due to excavation. Other supporting features are the production of notching in the glaucomatous disc and wedge shaped empty spaces in the retina due to severance and depletion of the arcuate fibers. Most importantly the histology of end-stage glaucomatous disc may not be a fully cupped LC but an empty crater left over after the severance of all nerve fibers.

Production of arcuate field defects in glaucoma? We

believe due to inherent temporal tilt of the disc, all the temporal fibers (macular, superior and inferior arcuate) are severed simultaneously. However, arcuate fibers being fewer in number compared to macular fibers would be depleted earlier resulting in arcuate/ring scotomas. It is a number game, not due to increased vulnerability or sensitivity of the arcuate fibers to IOP or its location.

Occurrence of splinter hemorrhages in the glaucomatous disc? We propose that splinter hemorrhages are due stretching and breaking of capillaries resulting from sinking of the LC - a fate similar met by nerve fibers.

Why are the nerve fibers being destroyed in an orderly fashion? Severance of the nerve fibers can explain the orderly destruction of nerve fibers in glaucoma. As the LC sinks, the peripheral fibers since being closest to the scleral edge are stretched and broken first. As a result the adjacent central fibers would move towards the periphery to occupy the space vacated by the preceding fibers and thus also get stretched and severed at the scleral edge. The movement of central fibers to the periphery would continue in an orderly fashion until the central most fiber is moved to the edge and severed. In nutshell, glaucoma may not be an optic disc neuropathy but an axotomy[7,8,9,10,11,12]

CONCLUSION

If fellow colleagues agree that cupping may not be occurring and the physiological cups are nothing more than vestigial tissue having no role in glaucoma, then it is our professional obligation to undo the mistake. The use of the terms cupping and cup/disc ratio is creating a conundrum in glaucoma diagnosis. Subjects born with large physiological cups and normal IOPs are being treated as NTGs whereas those born with small cups but high IOPs are being ignored treatment as ocular hypertension.

Even though many ophthalmologists don't agree with concept of cupping, they still fail to denounce the notion either. Such a failure is unfair to our profession and to our patients. We request glaucoma researchers to either definitively prove the occurrence of cupping or discard it altogether. We should be able to decide histologically in any case. If cupping is incorrect, then how can we ever solve the mystery of glaucoma when most of research is still centered on cupping paradigm? It is long overdue to re-examine the 'cupping' concept in glaucoma and necessary for the betterment of our profession.

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خدائے لم یزل کا دستِ قُدرت تُو، زباں تُو ہے
یقیں پیدا کر اے غافل کہ مغلوبِ گُماں تو ہے

اقبال


Prof. Marianne

REVIEW ARTICLE

Updates in Pharmacotherapy of Vaso-occlusive Retinopathy

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ABSTRACT:

Objective: Retinal vein occlusion as a vaso-occlusive disorder of the retinal vein is the most common visually disabling disease affecting the retina after diabetic retinopathy, and is a frequent cause of vision loss and even blindness. Although it is more common in the middle-aged and elderly population, no age group is immune to it. The retinal vein occlusion pathogenesis has varied systemic and local implications that make it difficult to elaborate treatment guidelines. In the past few years it was recognized that tissue hypoxia due to primary vascular occlusive disease is the most common driver of Vascular Endothelial Growth Factor (VEGF) synthesis and as retinal vein occlusion is associated with increased levels of VEGF, therapy by anti-angiogenics or vascular endothelial growth factor inhibitors (anti-VEGF) was proposed to be a promising strategy for retinal vein occlusion. Consequently, several anti-angiogenics have been developed for the treatment of vaso-occlusive disease of retinal vein and received approval. A flibercept (EYLEA (Regeneron Pharmaceuticals)) is the latest anti-VEGF agent received approval in several countries – US, European Union, Japan for the treatment of central retinal vein occlusion (CRVO) and submitted to FDA for use in branch retinal vein occlusion (BRVO). The objective of this review is to evaluate the efficacy of pharmacotherapy by VEGF inhibitor – Aflibercept, in vaso-occlusive disorder of retinal vein in evidence-based approach.

Key words: eye, central retinal vein, branch retinal vein, vaso-occlusion, vascular endothelial growth factor inhibitors, aflibercept

INTRODUCTION

Retinal vein occlusion (RVO) as a vasooclusive disorder of the retinal vein is the most common visually disabling disease affecting the retina after diabetic retinopathy, and is a frequent cause of vision loss and even blindness.[1] In a recent analysis of pooled data from population studies worldwide, the overall RVO prevalence was 0.52% (0.44% branch retinal vein occlusion (BRVO), 0.08% central retinal vein occlusion (CRVO), translating to approximately 16 million individuals worldwide affected by RVO.[2]

Depending on the location of the obstruction, the RVOs can be divided into central retinal vein occlusion and branch retinal vein occlusion. In CRVO the obstruction is located in the central vein, at the level of the optic nerve, so most of the retina is affected. Anatomic features make the central retinal vein vulnerable to occlusion at this location. As the optic nerve and the accompanying central retinal artery and vein pass through the sieve-like connective tissue of the lamina cribrosa, the central retinal vein normally narrows, and the dense connective tissue of the lamina cribrosa limits any expansion of the traversing optic nerve and vessels within. Any thickening of the central retinal artery, which shares a common fibrous tissue sheath with the vein, might easily compress the lumen of the adjacent central retinal vein and start in motion the sequence of events that lead to thrombus formation[3] In BRVO, the obstruction is located in one of the branches of the central vein, affecting only part of the posterior pole and the portion of the peripheral retina drained by occluded branch.[4]

The pathogenesis of RVO is multifactorial with both local factors and systemic diseases being etiologically important. Known risk factors for RVO include systemic vascular disease, hypertension, diabetes mellitus, hyperlipidemia, hyper coagulable states and glaucoma.

Despite being recognized at least as early as 1855.[5] its management is still controversial. Vascular retinopathy due to retinal vein occlusion causes retinal injury and loss of vision. The retina can also become "ischemic"(starved for oxygen), resulting in the growth of new, inappropriate blood vessels that can cause further vision loss and more serious complications. Release of vascular endothelial growth factor (VEGF) contributes to increased vascular permeability in the eye and inappropriate new vessel growth.VEGF contributes to increased permeability across both the blood-retinal and blood-brain barriers.

In CRVO there is increased intraluminal and interstitial pressure throughout the retina drained by the obstructed vessels, resulting in reduced arterial perfusion, which is exacerbated by pre-existent arterial insufficiency, and in variable amounts of retinal ischemia.

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Retinal ischemia causes increased production of vascular endothelial growth factor , which causes vascular leakage and macular edema. High levels of VEGF also promote retinal hemorrhages and exacerbate capillary non-perfusion.[6]

Human eyes with CRVO showed evidence of intra-retinal up regulated expression of VEGF mRNA.[7] Indeed, raised levels of VEGF have been reported in both the aqueous and vitreous fluid of patients with ischemic CRVO, and are responsible for the increase in vascular permeability that leads to macular edema (ME)[8] in CRVO and BRVO.[9]

Branch retinal vein occlusion also leads to retinal ischemia that induces the production of cytokines such as VEGF by retinal cells such as glial cells and vascular endothelial cells in the occluded region affected by anoxia. These cytokines interact with each other (cytokine network)and this results in impairment of the blood-retinal barrier and an increase of vascular permeability, considered important in the development of macular edema associated with BRVO.[10] Lee et al.[11] highligthed that ischemic insult may play a central role in the development of BRVO-ME.

Aqueous and vitreous levels of VEGF were significantly correlated with the severity of ME.[12,13] The logical consequence was a therapeutic regimen specifically targeting VEGF.

MATERIAL & METHODS

Therapy by Vascular Endothelial Growth Factor Inhibitors (anti-VEGF) is a clear break through, which has dramatically changed treatment and management of this sight-threatening retinal disease. In Shapiro et al.[14] and Hahn and Fekrat[15] opinions it is clear that anti-VEGF therapies may be only the beginning, since the therapeutic landscape for retinal disease is continually expanding with interesting developments in the near future. After 2 decades of extensive research into the VEGF families and receptors, specific molecules have been targeted for drug development, and several medications have received approval.

Aflibercept-EYLEA (Regeneron Pharmaceuticals) is the latest anti-VEGF agent received approval in several countries – US, European Union, Japan for the treatment of CRVO and submitted to FDA for use in BRVO. The objective of this review is to evaluate the efficacy of pharmacotherapy by VEGF inhibitor - Aflibercept in vaso-occlusive disorder of retinal vein in evidence-based approach.

Aflibercept

Aflibercept also known as VEGF-trap eye or EYLEA (Regeneron Pharmaceuticals, Inc., and Bayer Pharma AG, Berlin, Germany) is a recombinant fusion protein, consisting of portions of human VEGF receptors 1 and 2 extracellular domains fused to the Fc portion of human IgG1 and formulated as an iso-osmotic solution for intra-vitreal administration. EYLEA acts as a soluble decoy receptor that binds VEGF-A and placental growth factor (PlGF) and thereby can inhibit the binding and activation of these cognate VEGF receptors. Aflibercept is specially purified and contains iso-osmotic buffer concentrations, allowing for injection into the eye. Bayer HealthCare and Regeneron are collaborating on the global development of VEGF-Trap Eye for the treatment of the neo-vascular form of age related macular degeneration, CRVO and BRVO, diabetic macular edema and other eye diseases and disorders. Aflibercept (EYLEA, Regeneron) acts as a decoy receptor binding-free VEGF,[16] and binds all isoforms of VEGF-A with high affinity, and a markedly higher affinity than other anti-VEGF agents - ranibizumab or bevacizumab.[17] The vitreous half-life of aflibercept (18 days) is longer than ranibizumab (9 days).[18]

Aflibercept in central retinal vein occlusion

Aflibercept was approved by FDA for macular edema following CRVO in September 2012. Latter it was approved in European Union (EU), and recently (November 22, 2013) in Japan.[19]

RESULTS

The VEGF Trap-Eye is currently under evaluation in two phase III studies on CRVO (GALILEO and COPERNICUS Studies) with 6-monthly injections of drug or sham-controlled injections. The latest six-months results of the Phase 3 from COPERNICUS Study - multicenter, randomized, prospective, controlled trial[20,21] assessing the efficacy and safety of intravitreal Trap-Eye in one hundred eighty-nine eyes with macular edema secondary to central retinal vein occlusion (CRVO) randomized 3:2 to receive VEGF Trap-Eye 2 mg or sham injection monthly for 6 months evidenced that at week 24, 56.1% of VEGF Trap-Eye treated eyes gained 15 letters or more from baseline versus 12.3% of sham-treated eyes ($P<0.001$). The VEGF Trap-Eye treated eyes gained a mean of 17.3 letters versus sham-treated eyes, which lost 4.0 letters ($P<0.001$). Central retinal thickness decreased by 457.2 µm in eyes treated with VEGF Trap-Eye versus 144.8 µm in sham-treated eyes ($P<0.001$), and progression to any neovascularization occurred in 0 and 5 (6.8%) of eyes treated with VEGF Trap-Eye and sham-treated eyes, respectively ($P = 0.006$). Conjunctival hemorrhage, reduced visual acuity, and eye pain were the most common adverse events. Serious ocular complications were reported by 3.5% of VEGF Trap-Eye patients and 13.5% of sham patients. Incidences of non-ocular serious adverse events generally were well

balanced between both groups. The authors concluded that at 24 weeks, monthly intravitreal injection of VEGF Trap-Eye 2 mg in eyes with macular edema resulting from CRVO improved visual acuity and central retinal thickness, eliminated progression resulting from neovascularization, and was associated with a low rate of ocular adverse events related to treatment.

In 1-Year Results From the Phase 3 COPERNICUS Study Brown et al.[22] revealed a statistically significant improvement in visual acuity at week 24, which was largely maintained through week 52 with intravitreal aflibercept as needed (pro re nata -PRN) dosing. Intravitreal aflibercept injection was generally well tolerated.

In 2-Year Results From the Phase 3 COPERNICUS Study.[23] during weeks 52 to 100, patients were evaluated at least quarterly and received IAI PRN. The primary efficacy end point was the proportion of patients who gained ≥15 letters in best-corrected visual acuity (BCVA) from baseline to week 24. This study reports week 100 results. The proportion of patients gaining ≥15 letters was 56.1% versus 12.3% (P<0.001) at week 24, 413.0 versus 381.8 µm at week 52 (P = 0.546), and 390.0 versus 343.3 µm at week 100 (P = 0.366) in the IAI 2Q4 + PRN and sham + IAI PRN groups, respectively. The mean number (standard deviation) of PRN injections in the IAI 2Q4 + PRN and sham + IAI PRN groups was 2.7±1.7 versus 3.9±2.0 during weeks 24 to 52 and 3.3±2.1 versus 2.9±2.0 during weeks 52 to 100, respectively. The most frequent ocular serious adverse event from baseline to week 100 was vitreous hemorrhage (0.9% vs. 6.8% in the IAI 2Q4 + PRN and sham + IAI PRN groups, respectively). The visual and anatomic improvements after fixed dosing through week 24 and PRN dosing with monthly monitoring from weeks 24 to 52 were diminished after continued PRN dosing, with a reduced monitoring frequency from weeks 52 to 100.

Dr. Korobelnik presented the results on behalf of the GALILEO investigators at the annual meeting of the American Academy of Ophthalmology.[24,25] GALILEO is a double-masked study conducted at 62 centers in Europe and Asia. It randomly assigned 177 patients 3:2 to receive intravitreal aflibercept 2 mg or sham every 4 weeks until week 24.

Between week 24 and 52, patients continued monthly monitoring, but the aflibercept eyes received treatment as needed while the sham group continued to receive sham treatment every 4 weeks. From weeks 52 to 76, the inter-visit interval was extended to 8 weeks and sham patients were eligible for aflibercept. Nearly three-fourths of sham eyes and 85% of the aflibercept eyes completed 76 weeks of follow-up.

During the first 24 weeks of GALILEO, monthly aflibercept treatment resulted in rapid and sustained gains in best-corrected visual acuity. The improvement was largely maintained through week 52, but declined some between weeks 52 and 76. Similar temporal patterns were seen in analyses of changes in central retinal thickness (CRT) and proportion of eyes without retinal fluid in the aflibercept treatment group.

After becoming eligible for aflibercept, eyes in the sham group gained vision and had decreased CRT. However, outcomes at week 76 were superior in the eyes that had been treated with aflibercept since entry. Results from follow-up to 76 weeks in the phase III GALILEO study show that intravitreal injection of aflibercept (EYLEA, Regeneron Pharmaceuticals) provides marked improvement in visual acuity in treatment-naive eyes with macular edema secondary to central retinal vein occlusion. However, the data also suggest the value of close monitoring and early treatment.

In Evoy and Abel opinion[26] while efficacy and safety appear similar to other anti-VEGF treatments, the higher potency, binding affinity, and duration of action make EYLEA an appealing new option .

DISCUSSION

The results of GALILEO and COPERNICUS are encouraging for patients with central retinal vein occlusion. Almost uniformly all reviews[17,27-29] evaluating efficacy of different anti-VEGF drugs in treatment of CRVO reveal the efficacy of Aflibercept, despite the fact that long-term data are needed. The latest meta- analysis.[30] also obviate the need of future trials to evaluate the relative efficacy and safety of the anti-VEGF agents.

In Yang and McKeage[17] opinion more data are needed to confirm the optimal monitoring frequency for use with as required – PRN dosing, subsequent to initial monthly injections, in order to maintain long-term efficacy. Evidence from a recent first meta-analysis[31] suggests a similar finding, but at the same time it is recognized that aflibercept seemed to be most effective in improving visual acuity. In conclusion, effectiveness of Aflibercept in central retinal vein occlusion has a strong body of clinical evidence.

Aflibercept in branch retinal vein occlusion

A recent study assessing Aflibercept in BRVO treatment is the VIBRANT trial.[32] The Phase 3 VIBRANT trial was a double-masked, randomized, active-controlled study of 183 patients with macular edema following branch retinal vein occlusion. Patients received either intravitreal Aflibercept (EYLEA) 2 mg every four weeks or laser treatment, through week 24.

Laser patients were eligible to undergo rescue aflibercept injection at 12 weeks. The primary objective of the study was to evaluate the efficacy and safety of EYLEA in improving best-corrected visual acuity compared to laser treatment at week 24. The study is ongoing through week 52. Results from the Phase 3 VIBRANT trial were presented by Dr. Haller at Macula 2014,[33] by Dr. Clark,[34] by Dr. Boyer at the Association for Research in Vision and Ophthalmology 2014 Annual Meeting.[35]

The primary endpoint of this study was the percentage of patients who gained 3 lines (15 letters or more) of visual acuity. Secondary endpoints were the mean changes in best-corrected visual acuity (BCVA) and CRT measured on optical coherence tomography (OCT) images and the mean change in the National Eye Institute Visual Function Questionnaire-25 (VFQ-25) total score—all of which were assessed at week 24 of the study.

All patients were treatment-naive and had center-involved macular edema and visual acuity levels between 20/40 and 20/320. The treatment groups were well balanced at the start of the study. More than 90% of patients completed the week 24 evaluation. Patients in the aflibercept group received a mean 5.7 injections. Laser patients received a mean two injections. The trial is ongoing and patients continued in the study until week 52.

Currently available findings reveal that 53% of aflibercept patients and 27% of laser patients gained three or more letters at 24 weeks. The between-group difference was statistically significant. Visual acuities in the monthly injection group were significantly better than the laser followed by deferred rescue injections group. Mean change in best corrected visual acuity was 17 letters in the aflibercept group and 6.9 letters in the laser group. Central retinal thickness was reduced by a mean 280 μm in the aflibercept group and 128 μm in the laser group. Quality-of-life scores were slightly higher in the aflibercept group than in the laser group. The most common adverse events in the aflibercept group were typical of those commonly associated with intravitreal injections. Evidence from VIBRANT trial suggests that monthly intravitreal injections of aflibercept achieved superior gains in visual acuity and significant decrease in macular edema in patients with branch retinal vein occlusion after 24 weeks.

Based on the positive results from the Phase 3 VIBRANT trial (Regeneron Pharmaceuticals, Inc). announced in press release on Febr.24, 2014[3] that the U.S. FDA has accepted for standard review the Company's supplemental Biologics License Application (sBLA) for EYLEA® (aflibercept) Injection for the treatment of Macular Edema following Branch Retinal Vein Occlusion.

CONCLUSION

In conclusion, taken into account that trial is still ongoing at present, we have some open questions, which hopefully will be answered at the end of study. Therefore, it is important to know the long term efficacy and safety data of the therapy, tailoring treatment to the individual patient-6, initial injections are needed for all patients or three monthly injections followed by every-other-month injections of aflibercept or as needed, which will lead to a lower injection need.

Currently available evidence suggests that repeated early frequent treatment of CRVO and BRVO with the anti-VEGF agent aflibercept (EYLEA), gives the best chance of achieving and stabilizing both optimal anatomical and visual outcomes in the short to medium term. There is no standard protocol regarding the optimal timing of initial treatment with aflibercept and subsequent retreatment is yet to be formulated. Where multiple injections are likely to be required, the effectiveness and safety over longer periods has yet to be determined. With more research and experience into exploring the frequency and safety of currently available agent- EYLEA, it is also likely that clinicians would achieve the best protocol when dealing with patients suffering from vaso-occlusive disorder of the retinal vein.

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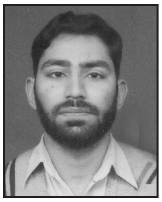
M. Idris

ORIGINAL ARTICLE

Demographic Features and Frequency of Astigmatism in Patients with Primary Pterygium (A study with a different angle)

Mohammad Idris FCPS[1], Farid Khan[2], Hasan Yaqoob FCPS, FRCS [3]
Naseer Ahmad DOMS[4], Sadia Ayaz MBBS[5]

ABSTRACT

Objective: To determine the demographic features and frequency of astigmatism in patients with primary Pterygium.

Introduction: Pterygium is a mixed soft tissue tumor that is strongly associated with non-ionizing ultraviolet radiation. Pterygium is a common ocular surface disease characterized by fibro vascular invasion of the cornea and is sight-threatening due to astigmatism, tear film disturbance, or occlusion of the visual axis.

Study design: descriptive case series

Methodology: This study was conducted at OPD, Eye Department, Lady Reading Hospital, Peshawar , from 4th April 2009 to 4th April 2010. Patients were examined after detailed history and important findings noted. Non probability purposive sampling technique was used.

Results: A total of 142 patients of primary Pterygium were included in the study. There were 88 (61.97%) were males and 54(38.03%) were females. Male to female ratio was 1.63:1. Average age of the patients was 49.09 years+15.99SD with range 20-78 years. The astigmatism in primary Pterygium was observed in 36(25.35%) while in 106(74.65%) patients show no astigmatism.

Conclusion: pterygium is responsible for inducing astigmatism and successful pterygium surgery reduces the pterygium-induced refractive astigmatism and improves the visual acuity.

Key words: Primary Pterygium, astigmatism, Ophthalmoscopy, Visual acuity

INTRODUCTION

Pterygium is a common ocular surface disease characterized by fibro vascular invasion of the cornea and is sight-threatening due to astigmatism, tear film disturbance, or occlusion of the visual axis. However, the mechanisms for formation and post-surgical recurrence of pterygium are not understood, and a valid animal model does not exist.[1]

Pterygium is a mixed soft tissue tumor that is strongly associated with non-ionizing ultraviolet radiation.[2] Pterygium extension and total area have a stronger correlation with corneal astigmatism than does width. Surgical intervention is indicated when pterygium extension exceeded 2.2 mm, width exceeded 5 mm, or total area exceeded 6.25 mm.[3]

Pterygium leads to a considerable effect on corneal refractive status which has been previously measured in various studies by refraction, keratometry and corneal topography. Pterygium leads to significant changes in corneal refractive status, which increases with the increase in the grade of pterygia and improve following pterygium excision.[4]

The prevalence of Pterygium in either eye is 19.6% and of bilateral Pterygium 8.0%. Pterygium leads to 0.8% of low vision in at least one eye. Pterygium is associated with 1.0% of visual impairment in at least one eye.[5] The proportion of corneal astigmatism was found 38% having average of 2mm or more than 2mm of Pterygium.[6]

Pterygium surgery produces improvements in visual acuity, decreases in refractive spherocylinder power, topographic irregularity, and topographic astigmatism.[7]

Considering its prevalence and the need to prevent visual morbidity, a study was conducted in Department of Ophthalmology, Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Lady Reading Hospital Peshawar, whose purpose was to assess the frequency of astigmatism in patients with primary Pterygium and to quantify the astigmatic changes associated with it.

METHODOLGY

The study was conducted at Out Patient Department, Eye Unit of Lady Reading Hospital, Peshawar. Using WHO software for sample size calculation, where confidence level=95%, proportion of corneal astigmatism in primary pterygium=38%, absolute precision =8%, making sample size of 142. This was a non-probability purposive sampling. It was a cross sectional observational study. An informed written consent was

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obtained from the patient. The patients were evaluated for inclusion and exclusion criteria. A special data collection proforma was filled for each patient having a detailed record of the disease including name, age, gender, address, duration of symptoms, like decreased visual acuity, itching, burning and slit lamp finding and any past history of treatment including surgery were assessed. Visual acuity was tested using standard Snellen visual acuity chart along with best corrected visual acuity using pin hole.

Ocular examination of type of pterygium, size including length and breadth of the pterygium was made with the help of slit lamp. Keratometry was done of both eyes to assess the amount of the astigmatism. Retinoscopy and power of cylindrical lens used for best corrected visual acuity was determined. The ***exclusion criteria*** were strictly followed to control confounder and bias in the study results.

All those patients who refuse to give consent for this study were excluded and refractive errors causing astigmatism other than pterygium, Like corneal surgery or ptosis of eye lid as well as patients with secondary or recurrent pterygium, psuedopterygium in which the tarsal conjunctiva abnormally adhere with bulbar conjunctiva or cornea were also excluded because these act as confounder and introduce bias in the result.The data was analyzed with SPSS 10.0.

RESULTS

A total of 142 patients of primary Pterygium were included in the study. There were 88 (61.97%) were males and 54(38.03%) were females. Male to female ratio was 1.63:1. (Figure 1). Average age of the patients was 49.09 years+15.99SD with range 20-78 years. Patient's age was divided in four categories, out of which most common age group for primary Pterygium was 20-40 years. There were 59(41.5%) patients which were of the age less than 40 years. Fourteen (9.9%) patients were in the age range of 41-55 years, 53 (37.3%) were of age range 56-70 years, 16(11.3%) presented at age more than 70 years of age. (Table 1)

The astigmatism in primary Pterygium was observed in 36(25.35%) while in 106(74.65%) patients show no astigmatism. (Figure 2) Age wise distribution of astigmatism shows that astigmatism in old age was little bit high as that of younger age. The patients having age less than or equal to 40 years of age have astigmatism 28.8% while no retinal detachment was 71.2%, age group 41-55 years contain 14.30% astigmatism and 85.7% shows no astigmatism, 56-70 years age groups gave 24.5% astigmatism with 85.7% no astigmatism and patients having more than 70 years of age have 31.2% astigmatism while 68.8% have non astigmatism in primary Pterygium patients. (Table 2)

Gender wise astigmatism in primary Pterygium shows that gender have minor role over astigmatism. There are 17% astigmatism in male and 83% have shows non astigmatism. On other hand 40.7% of male patients show astigmatism while 59.3% shows non astigmatism. (Table 3)

Occupation were divided in two categories (i.e. indoor and outdoor) and the occupation wise astigmatism in primary Pterygium shows that occupation have no role over astigmatism in our study. There are 24.4% astigmatism in indoor and 75.6% have shows non astigmatism. While 28.6% of indoor patient's shows astigmatism while 71.4% shows non astigmatism. (Table 4)

Figure-1: Gender wise distribution of the patients n=142

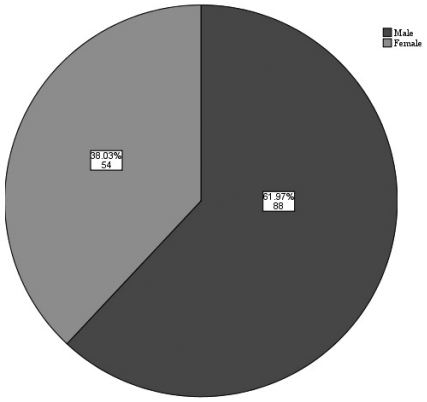

Table-1: Age wise distribution of the patients n=142

	Frequency	Percent	Cumulative Percent
20.00- 40.00	59	41.5	41.5
41.00 - 55.00	14	9.9	51.4
56.00 - 70.00	53	37.3	88.7
71.00+	16	11.3	100.0
Total	142	100.0	

Figure-2: Astigmatism in patients with primary pterygium n=142

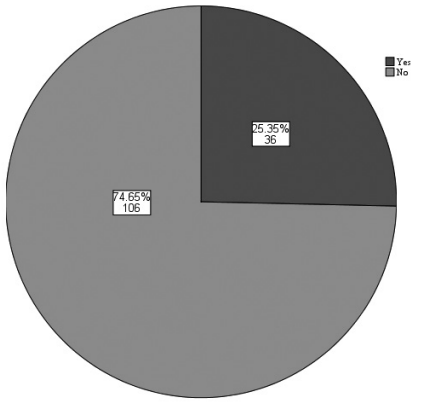

Table-2: Age wise distribution of astigmatismN=142

		Astigmatism		Total
		Yes	No	
Age (in years)	<= 40.00	17	42	59
		28.8%	71.2%	100.0%
	41.00 - 55.00	2	12	14
		14.3%	85.7%	100.0%
	56.00 - 70.00	13	40	53
		24.5%	75.5%	100.0%
	71.00+	5	11	16
		31.2%	68.8%	100.0%
Total		37	105	142
		26.1%	73.9%	100.0%

Table-3: Gender wise distribution of astigmatism N=142

			Astigmatism		Total
			Yes	No	
Gender	Male	Count	15	73	88
		% within Gender	17.0%	83.0%	100.0%
	Female	Count	22	32	54
		% within Gender	40.7%	59.3%	100.0%
Total		Count	37	105	142
		% within Gender	26.1%	73.9%	100.0%

Table-4: Occupation wise distribution of astigmatism N=142

			Astigmatism		Total
			Yes	No	
Occupation	Indoor	Count	21	65	86
		% within Occupation	24.4%	75.6%	100.0%
	Outdoor	Count	16	40	56
		% within Occupation	28.6%	71.4%	100.0%
Total		Count	37	105	142
		% within Occupation	26.1%	73.9%	100.0%

DISCUSSION

Pterygium is known to affect refractive astigmatism, which can have a significant impact on vision. Several mechanisms have been suggested to explain the induced astigmatism. Pterygium induced astigmatism can often be the cause of subjective visual complaints, which include decreased visual acuity or visual aberrations such as glare or diplopia. Previous studies have shown increased 'with the rule' astigmatism in patients with pterygia by both refraction and Keratometre.[9, 22]

Astigmatism can also be induced by other causes such as intra ocular surgery[10] but such patients were excluded from our study. Keratoscope images are formed by a reflection that occurs at the tear film layer. Tear film may not be problematic if it is uniform over the entire corneal surface, but it can create difficulties if the patient is tearing sufficiently to cause lacrimal lakes at the upper or lower lid margins or if focal tear film breaks up leads to digitization errors.[11,23-24] The cause of astigmatism in advanced pterygium appears to be an alteration of the tear film, rather than traction on the cornea by the pterygial lesion.[12]

Astigmatism of eyes with pterygium was found to be significantly greater than that of normal human controls.[9,13-14] Lin and Stern [13] recently also reported that pterygium extending to >45% of the corneal radius or within 3.2 mm of the visual axis produced increasing degrees of induced astigmatism. They concluded that since all of the visual and topographic indices were significantly improved by successful surgery, it should be considered when the pterygium begins to induce significant degrees of hemiastigmatism.[13, 25]

Pterygium-induced astigmatism can lead to visual complaints. Previous studies have shown pterygium induces with-the-rule astigmatism.[15,16] The astigmatism appears to be due to an alteration in the tear film caused by the lesion. As the head of the pterygium approaches the apex of cornea, a tear meniscus develops between the corneal apex and the elevated pterygium, causing an apparent flattening of normal corneal curvature.[17, 26] Patients older than 40 years have the highest prevalence of pterygia, while patients aged 20-40 years are reported to have the highest incidence of pterygia. Clinical history of the patients with pterygia present with a variety of complaints, ranging from no symptoms to significant redness, swelling, itching, irritation, and blurring of vision associated with elevated lesions of the conjunctiva and contiguous cornea in one or both eyes.[8]

Ashaye AO[18] in his study showed that there was a statistically significant association between refractive astigmatism and the presence of pterygium($P < 0.01$). Astigmatism was the rule in most patients. Surgical removal caused a reduction in refractive astigmatism. The change in refractive astigmatism was as high as 1.50DC. According to Lin A. and Stern G,[19] once pterygia reach a critical size, they induce visually significant central with-the-rule astigmatic changes that may not be apparent by subjective refraction. This finding helps to identify those patients who may benefit from surgical intervention. Maheshwari S. in his study verifies that as the size of pterygium increases, the amount of induced astigmatism increases in direct proportion. Successful pterygium surgery reduces the pterygium-induced refractive astigmatism and improves the visual acuity.[27-28] Significant astigmatism was found in 16.16% of 24 eyes with pterygium of 0.2 up to 1.0 mm in size, in 45.45% of 22 eyes with pterygium of 1.1 up to 3.0 mm in size ($P <$ or $= 0.0004$), and in 100% of 3 eyes with pterygium of 5.1 up to 6.7 mm in size ($P = 0.0005$). We found that visual acuity was decreased when topographic astigmatism was increased.[20]

The astigmatism seen in the patients represents both naturally occurring astigmatism and induced

astigmatism. It may be incorrect to label the entire astigmatism as "induced". We would like to believe that majority of the astigmatism seen in the study was caused by the pterygium itself since it was always "with-the-rule" whereas naturally occurring astigmatism can occur at any of the axis. The prevalence of Pterygium in either eye is 19.6% and of bilateral Pterygium 8.0%. Pterygium leads to 0.8% of low vision in at least one eye. Pterygium is associated with 1.0% of visual impairment in at least one eye.[5] the proportion of corneal astigmatism was found 38% having average of 2mm or more than 2mm of Pterygium[6, 29]

Lin et al[21] have reported that the pterygium begins to induce significant degrees of hemi astigmatism once it reaches up to 45% of the distance from the limbus to the visual axis or within 3.2mm of visual axis. Such an observation was made in the present series .One eye with double-headed pterygium had 7D of astigmatism; due to the increase in corneal involvement in double-headed pterygium, the induced astigmatism is higher.[30-31]

CONCLUSION

Pterygium is related to the amount of induced astigmatism. The relation is stronger in the pterygia of moderately severe degree (2.1-4mm) as in this group the pterygium starts encroaching on the visual axis. Corneal topography analysis is an important component for evaluating patients with pterygium, revealing significant abnormalities that indicate the need for surgical intervention. Pterygium is responsible for inducing astigmatism therefore successful pterygium surgery reduces the pterygium-induced refractive astigmatism and improves the visual acuity.

RECOMMENDATIONS

Pterygium is almost inevitable, if left unmanaged. Regular examinations have been shown to be effective. Timely and appropriate surgery reduces ocular morbidity, visual impairment and blindness associated with Pterygium. Therefore keeping these things in mind, we can prevent the sequelae of pterygium.

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Abid Halim

ORIGINAL ARTICLE

Comparison of Muscle Cutting and Muscle Sparing in Open Cholecystectomy

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ABSTRACT

Objective: Objective of the study was to determine the effectiveness of muscle cutting and muscle sparing in open cholecystectomy in terms of pain and hospital stay.

Materials and Methods: This randomized control study was done in surgical department, Khyber Teaching hospital, Peshawar from 4/01/2009 to 31 /2/2014 recruiting 135 patients with symptomatic Gall stones, divided into 2 groups; Group A (muscle cutting, 67 patients) and Group B (Muscle sparing, 68 patients). Patients were reassessed after 24 hours for pain measured by visual analogue score and hospital stay was recorded. Data was analyzed in software SPSS version16.0. T test was applied to compare the mean pain and hospital stay, keeping p value < 0.05 as significant.

Results: Mean age of patients in group A and group B were respectively 36.86 years+7.10 SD and 38.28 years+7.87 SD for male and 37.90 years+8.57 SD and 39.40 years+6.04 SD for female (P=0.396). Mean pain ± standard deviation after 24 hours in group A and group B respectively were; 6.7302 ± 0.6875SD and 5.0012 ± 0.2534SD (P=0.0001). Mean duration of hospital stay in group A and group B respectively were; 2.36 days ± 1.00 SD and 2.56 days ± 1.09 SD for male and 2.67 days ± 1.97 SD and 2.76 days ± 1.16 SD for female (P=0.541)

Conclusion: Cholecystectomy through muscle splitting technique by right subcostal incision is less painful and has shorter hospital stay.

Key words: Gall stones; Open cholecystectomy; Muscle Splitting; Muscle Cutting

INTRODUCTION

Stones are the concretions that can form in any part of the biliary tract, and when this involves the gall bladder, it is called choledolithiasis.[1] Gallstones are one of the most prevalent and most expensive gastroenterological diseases, leading to a great economic burden[2]. Approximately 80 percent of gallstones contain cholesterol (as cholesterol monohydrate crystals). The remaining 20 percent are pigment stones, which consist mainly of calcium bilirubinate.[3,4]

Known risk factors favoring lithogenesis include age, obesity, female gender, high blood triacylglycerol levels and multiparity.[5] Most serious factors include a high intake of oil oriented food (high calories in the form of Pakora, Samosa, Karahi) and high prevalence to obesity, diabetes and sedentary lifestyle are very popular in Pakistan.[6]

Ever since the emergence of laparoscopic cholecystectomy, which has become the gold standard for symptomatic gallstones,[7,8,9] the open technique has gone into the background. But, it is likely that up to 10% of patients require an open cholecystectomy whether owing to contraindications to the laparoscopic approach or because conversion to the open technique becomes necessary following laparoscopy. So the art of open surgery is still alive.[10,11]

In this randomized control study we aimed to find the effectiveness of muscle cutting and muscle splitting in open cholecystectomy in terms of pain control and hospital stay.

MATERIAL AND METHODS

This randomized control study was carried out at the department of general surgery, Khyber Teaching Hospital, Peshawar from 24/01/2009 to 31 /2/2014 recruiting 135 patients with symptomatic gall stones The patients of either sex with age from 21 to 60 were ***included*** in the study. Empyema gall bladder, known choledolithiasis, upper laparotomy or with hemorrhagic tendency due to any reason and known cirrhosis of the liver were excluded from the study. Patients not willing to give informed consent for open cholecystectomy and wishing to undergo laparoscopic cholecystectomy and patients who were converted to open cholecystectomy were also ***excluded*** from the study.

Prior permission from the hospital research and ethical committee was sought and patients with symptomatic gallstones were recruited from OPD of general surgery. The purpose and benefits of the research study were explained to the patients which is done purely for research and data publication and a written informed consent was obtained.

After inclusion in the study, patients were divided into two groups by lottery method; Group A (67 patients) and B (68 patients) underwent open cholecys-

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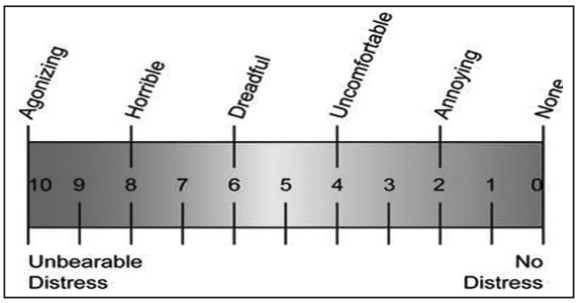
tectomy through muscle cutting and muscle splitting technique respectively. Right rectus muscle of the abdominal wall was not cut in muscle splitting subcostal incision while, in muscle cutting, the right rectus muscle of the abdominal wall was cut. All surgeries were performed by a single surgeon. A detailed history followed by detailed physical and systemic examination was done. The diagnosis was confirmed on ultrasonography (distended gall bladder with calculi). Routine investigation like full blood count, blood urea and sugar, serum electrolytes and investigations for anaesthesia fitness like chest X-ray, ECG and liver function tests were performed.

All patients were operated through right Kocher's incision under general anaesthesia. In group A, muscle cutting was done while in group B muscle splitting technique was adopted. All patients were given an IV injection of cefuroxime 1.5 gm at induction of anaesthesia and 2 doses of the same were repeated postoperatively. Gall bladder was removed after ligation and cutting of the cystic artery and duct. Abdomen was closed in layers in reverse fashion. Drain in gall bladder bed was placed where needed.

Patients were re-assessed after 24 hours to determine intervention effectiveness in terms of comparing mean pain. Pain was assessed by visual analogue score (VAS) using a 10cm line labeled at "0" with "no pain" and "10" with "worst pain" as shown below.



The patients started oral feeding 8 hours postoperatively. Abdominal ultrasound was done for all the patients in both groups on the third day before discharge to show any collection or free fluid in the abdomen. The patients were discharged after removal of drain, and when the patients had no complaints. Duration of hospital stay was recorded.

All the above mentioned information including name, age, gender, address were recorded in a predesigned proforma. Exclusion criteria were followed strictly to control confounding variables and bias in the study results.

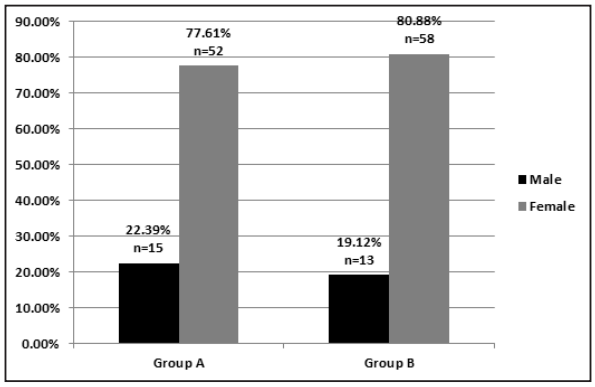
Data was entered in software SPSS version 10. Descriptive statistics was used to calculate mean and standard deviation of age and duration of hospital stay of patients in both groups. Frequency and percentage were calculated for gender and effectiveness of both techniques. The results were presented as tables and graphs and p value ≤ 0.05 as significant (in case of comparative study).

RESULTS

There were 67 patients in group A and 68 patients in group B. In Group A (muscle cutting), there were 15 (22.39%) males and 52 (77.61%) females. In Group B (muscle sparing), there were 13 (19.12%) males and 55 (80.88%) females. P value equals 0.6759 and it is considered to be statistically insignificant. The male to female ratio in Group A and B was 1:3.46 and 1:4.23.(Graph no. 1)

Mean age of patients in group A and group B were respectively 36.86 years$\pm$7.10 SD and 38.28 years$\pm$7.87 SD for male and 37.90 years$\pm$8.57 SD and 39.40 years$\pm$6.04 SD for female. P value is 0.396 which is insignificant. Mean pain ± standard deviation after 24 hours in group A and group B respectively were; 6.7302 ± 0.6875SD and 5.0012 ± 0.2534SD. The P value was 0.0001 and this difference is considered to be extremely statistically significant. Mean duration of hospital stay in group A and group B respectively were; 2.36 days ± 1.00 SD and 2.56 days ± 1.09 SD for male and 2.67 days ± 1.97 SD and 2.76 days ± 1.16 SD for female. P value is 0.541 and is insignificant statistically.

Graph No-1



DISCUSSION

First cholecystectomy was performed by Carl-Langenbuchon 15th July 1882 through T shaped incision; the horizontal limb of the incision was parallel to the liver edge and longitudinal limb ran along the lateral border of rectus muscle.[12]

In our study, there was female predominance and it has been documented by the other studies as well.[13,14] Reduction of abdominal wall trauma by use of short incision should be accompanied by rapid recovery and short hospital stay for patients.[15,16] The mean pain in the muscle splitting group was significantly low as

compared to in muscle cutting group (P=0.0001). Mean duration of hospital stay in muscle splitting group was also significantly short than muscle cutting group (P=0.541) Cholecystectomy done through muscle splitting technique is an attractive procedure with well-established superiorities irrespective of the enthusiasm for laparoscopic accomplishment. In addition no special equipment or training is required. We had no technical difficulties in doing muscle splitting nor there was any significant postoperative problem noticed.

In a local study by Saeed N, et al[13] reported that a shorter hospital stay of 2 days and few complications and there were no bile duct injury or mortality. In another local study by Khan N, et al,[17] the average hospital stay was 3 days noted and only 3 patients developed complications out of 100 patients. Seale and Ledet,[18] by preserving the rectus muscle as much as possible in patients, reported that 89% were discharged in less than 12 hours after operation. They reported a low complication rate 0.2% and only 0.3% of the day surgery patients were re-admitted. Thomas et al,[19] by preserving right rectus muscle in 30 consecutive patients discharged 73.35% of patients to home on the operating day. They noticed neither complications nor re-admission occurred in this study.

To our knowledge, this was the first comparative study conducted on muscle splitting and muscle cutting subcostal incision for cholecystectomy in our set up. We performed the study in a community setting with patients of various socioeconomic classes. Participants' compliance was high and our surgeon was familiar in performing both techniques. In our study, statistical analyses were straight forward, and missing data analysis was not required. However, our technique was not without limitations. As with any surgical procedure, duration of surgery may vary depending on the operator and patient physique and anatomy of hepatobilliary system.[20] This was a pilot study and further research is required to elaborate this technique of providing the most beneficial technique for open cholecystectomy in terms of postoperative pain, duration of operation, length of hospital stay, and post- operative morbidity. The lack of facilities and training in laparoscopic techniques and also conversion of laparoscopic cholecystectomy to open procedure constantly give us message that open cholecystectomy should be modified in a way that the diseased gall bladder should be removed safely with little trauma and pain, early recovery with short hospital stay.

CONCLUSION

Cholecystectomy through muscle splitting technique in right subcostal incision is a safe procedure with less pain, fewer complications, better prognosis, and less of postoperative hospital stay. More effort should be put in, to improve this technique rather than by-pass it as it may be recommended as a procedure of choice where laparoscopic facilities are not available or converted to open surgeries.

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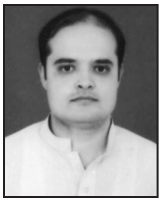
M. Imran Khan

ORIGINAL ARTICLE

Outcome of Surgical Decompression of Carpal Tunnel in Carpal Tunnel Syndrome

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Muhammad Ayaz Khan FCPS[4]

ABSTRACT

Objective: The purpose of this study was to evaluate the outcome of carpal tunnel release via small palmer incision (mid palmar-incision technique) in patients with carpal tunnel syndrome.

Settings and Designs: Prospective study.

Materials and Methods: This prospective clinical study was carried out from May 2012 to May 2013 at out-patient department of Agency Headquarter Hospital Landikotal. A total of 50 patients who were regularly followed up completed the study. All the patients were followed at 2 weeks, 2 months and 4 months for the evaluation of outcome of release. The self-administered Boston Questionnaire13 was used to assess the severity of patients' symptoms and their functional status, both before and after the surgical intervention and at their final follow-up.

Results: The FSS scores had a high correlation with scores of the symptom severity scale indicating that patients who had severe symptoms had major functional limitations. There was a significant decrease in the Boston Carpal Tunnel Questionnaire scores for the symptom severity scale (SSS) and the functional status scale (FSS) of patients in both groups, pre-operatively and post-operatively at two months. A statistically significant decrease was found in the SSS and FSS scores of patients in both groups, pre-operatively and at final follow-up of 4 months ($p < 0.001$) (table-2). Conclusion: Release of carpal tunnel through small palmer incision is an easy, cost effective and less tissue damaging technique of decompression. It has excellent patient outcome and low complication rate.

Key words: Carpal tunnel syndrome, Boston questionnaire, decompression.

INTRODUCTION

This peripheral entrapment neuropathy affects 1-3% of general population, 10% of high risk individuals and is notorious for being the most common neuropathy in health care.[1,2] The carpal tunnel or carpal canal is the passage way on the palmar side of the wrist that connects the forearm to the middle compartment of the deep plane of the palm.[3] The tunnel consists of bones and connective tissue. Several tendons and the median nerve pass through it. The canal is narrow and when any of the nine long flexor tendons passing through it swells or degenerates, the narrowing of the canal often results in the median nerve becoming entrapped or compressed, a medical condition known as carpal tunnel syndrome.[4] The main symptom of CTS is intermittent numbness of the thumb, index, long and radial half of the ring finger.[4] The numbness often occurs at night, with the hypothesis that the wrists are held flexed during sleep.[5]

In mild to moderate CTS, conservative treatment in the form of wrists splints, oral corticosteroids, judicious steroid injections, ultrasound and physiotherapy are given. But as condition gets worsen or when the response to conservative treatment is not encouraging then surgical decompression is recommended.[6] The technique of surgical decompression has modified quite a bit since the initial description in 1924. Now a days, decompression of carpal tunnel can be done via various surgical techniques which broadly categorized in to endoscopic and non-endoscopic methods. Nonendoscopic methods include (1) a standard open technique using a long palmar skin incision to transect the transverse carpal ligament (TCL) under full direct visualization, (2) a wrist-incision technique to blindly transect the TCL proximally to distally, and (3) a mid-palmar-incision technique to transect the TCL distally to proximally.[7-11]

The purpose of this study was to evaluate the outcome of carpal tunnel release via small palmer incision (midpalmar-incision technique) in patients with carpal tunnel syndrome.

MATERIALS AND METHODS

This prospective clinical study was carried out from May 2012 to May 2013 at out-patient department of Agency Headquarter Hospital Landikotal. A total of 52 patients were eligible for the study. No patient chose to withdraw; however, 2 patients who did not regularly attend the follow-up visits were omitted from the study. A total of 50 patients who were regularly followed up completed the study. The diagnostic criteria

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were;

1. Typical history of numbness and paresthesia in the distribution of median nerve, particularly at night.
2. Positive compression test-which consists of applying focal pressure over the volar aspect of the carpal tunnel to induce sensory symptoms in the distribution of the median nerve.
3. Positive electrophysiological studies.

The exclusion criteria were

1. a previous history of acute trauma,
2. wrist fracture,
3. steroid injection
4. pregnancy
5. rheumatoid arthritis.
6. Cervical pathologies

All patients were informed about the nature of the disease and plan of treatment. Written informed consents were given by all patients. All patients were operated on in an outpatient setting on local anaesthesia under tourniquet control. Skin preparation and sterilization was performed as usual. A longitudinal skin incision of about 2.0cm was created in the palm with its distal end about 0.5 to 1.0 cm proximal to the kaplan's cardinal line.[12] The wound was then deepened. The TCL was longitudinally divided using a number 15 blade and small blunt-end scissors under direct visualization. The wound was closed with prolene 4/0. The wound was then dressed and bandaged. The tourniquet pressure was released. No splint was used. Non-steroidal anti-inflammatory drugs and oral antibiotics were given for one week. The patients were instructed to move their fingers after the operation.

All the patients were followed at 2 weeks, 2 months and 4 months for the evaluation of outcome of release. The self-administered Boston Questionnaire[13] was used to assess the severity of patients' symptoms and their functional status, both before and after the surgical intervention and at their final follow-up. The Boston Questionnaire consists of 11 items for symptom severity scores (SSS) and eight items for functional severity scores (FSS). The result was calculated by adding the scores, from 1 to 5, then dividing this sum by the number of questions (table-1). The data analysis was performed using SPSS statistical software. The significance level was considered at 0.05 p-Values.

Table-1: Boston Questionnaire13 Symptoms Severity Score (SSS)

(Choose one answer in each question)	
1) How strong is the pain on your hand or wrist at night?	
1-	I feel no pain on hand or wrist at night.
2-	little pain
3-	moderate pain
4-	intense pain
5-	severe pain
2) How many times did your hand or wrist pain wake you up in a typical	
night for the last two weeks?	
1-	never
2-	once
3-	twice or three times
4-	four to five times
5-	more than five times
3) Do you usually feel hand or wrist pain during the day?	
1-	I never feel pain during the day
2-	I feel little pain during the day
3-	I feel moderate pain during the day
4-	I feel intense pain during the day
5-	I feel severe pain during the day
4) How often do you feel hand or wrist pain during the day?	
1-	never
2-	once or twice a day
3-	three to five times a day
4-	more than five times a day
5-	constant pain
5) In average, how long do daytime pain episodes last?	
1-	I never feel pain during the day
2-	less than 10 minutes
3-	from 10 to 60 minutes
4-	more than 60 minutes
5-	I feel constant pain during the day
6) Do you feel your hand dormant (lost sensitiveness)?	
1-	no
2-	I feel little dormancy
3-	I feel moderate dormancy
4-	I feel intense dormancy
5-	I feel severe dormancy
7) Do you feel weakness on your hand or wrist?	
1-	no weakness
2-	little weakness
3-	moderate weakness
4-	intense weakness
5-	severe weakness
8) Do you feel a tingling sensation on your hand?	
1-	no tingling sensation
2-	little tingling sensation
3-	moderate tingling sensation
4-	intense tingling sensation
5-	severe tingling sensation
9) How strong is dormancy (lost sensitivity) or tingling sensation at night?	
1-	I never feel dormancy or tingling sensation at night
2-	little
3-	moderate
4-	intense

5-	severe
10) How often did dormancy or tingling sensation wake you up during a typical night for the last two weeks?	
1-	never
2-	once
3-	twice to three times
4-	four to five times
5-	more than five times
11) How difficult do you feel in taking and using small objects, such as	
keys or pens?	
1-	not difficult
2-	a little difficult
3-	moderately difficult
4-	very difficult
5-	severely difficult

Functional Severity Score (FSS)

ACTIVITY LEVEL OF DIFFICULTY	
Writing 1 2 3 4 5	
Buttoning clothes 1 2 3 4 5	
Holding a book while reading 1 2 3 4 5	
Holding the telephone hang 1 2 3 4 5	
Housekeeping 1 2 3 4 5	
Opening a glass vial cap 1 2 3 4 5	
Carrying market bags 1 2 3 4 5	
Bathing and dressing 1 2 3 4 5	
No difficulty	1
Little difficulty	2
Moderate difficulty	3
Intense difficulty	4
Cannot perform the activity at all due to hands and wrists symptoms	5

RESULTS

At the end of this study, 2 hands were lost to follow-up. Therefore, we analyzed the outcome of 50 hands. The average follow-up period for the 50 hands was 4.2 months (range, 3 to 5 months). The number of consecutive patients with only idiopathic CTS was 50,(43 female, 7 male), mean age 44.1 years (range 22-67), median duration of symptoms 18 months (range 4-22 months). Patients completed the questionnaire with no difficulty and described the Boston Questionnaire to be simple and easy to understand. The FSS scores had a high correlation with scores of the symptom severity scale indicating that patients who had severe symptoms had major functional limitations. There was a significant decrease in the Boston Carpal Tunnel Questionnaire scores for the symptom severity scale (SSS) and the functional status scale (FSS) of patients in both groups, pre-operatively and post-operatively at two months. A statistically significant decrease was found in the SSS and FSS scores of patients in both groups, pre-operatively and at final follow-up of 4 months ($p < 0.001$) (table-2).

Table-2: Patients' results of Boston carpal tunnel questionnaire scores

Boston quest	Pre-op	Post-op 2 month	Post-op 4 months
SSS	3.27	2.41	1.41
FSS	3.10	2.14	1.59

DISCUSSION

Division of the flexor retinaculum under direct vision is widely practiced, safe and predictable procedure with low incidence of complications. It is believed that pain, tenderness and skin sensitivity of the carpal can be reduced dramatically by reducing the size of incision and removing it from the middle of the palm.[14] In the present study, our patients had postoperative incidence of scar pain of 7%, which was close to that of the endoscopic techniques and other minimal palmar incision techniques.[15, 16] The reduction in the destruction of skin, subcutaneous tissue, and palmar fascia and the preservation of the important fascia convergence between the thenar and hypothenar muscles is believed to have contributed to the lower morbidity observed with endoscopic and minimal palmar incision techniques.[17]

In this study, ages ranged from 22 to 67 years old, with an average of 44.1 years which is very much comparable to other studies in the literature.[18,19,20,13] In our study, the incidence of females is higher, as reported in other studies.[18,20] Postoperative follow-up time using the Boston questionnaire as an evaluation instrument was 1 – 6 months in one study[20] and 3 – 6 months in another study.[18] Our followup range was up to 4 months.

We performed all the cases on local anaesthesia under tourniquet control. The tourniquet pressure was kept to a minimum to lessen the amount of pain and agony experienced by the patient. Patel et al[21] compared two different techniques of local anaesthesia in his study. We performed the procedures via small palmer incision, keeping the subcutaneous dissection to a minimum. Tzaan et al[22] performed decompression through the same incision producing excellent relief of symptoms (90%-to-complete improvement), nine (9%) had good relief of symptoms. (70%-or-greater improvement), four (4%) had fair relief of symptoms (50%-or-

greater improvement), and five (5%) had only minimal improvement or no change in their symptoms. We observed comparable results to those produced by Tzaan. Similarly Ucar et al,[23] Broomley et al[24] and Avci and Sayli[25] observed similar type of results using same min-incision technique.

CONCLUSION

Release of carpal tunnel through small palmer incision is an easy, cost effective and less tissue damaging technique of decompression. It has excellent patient outcome and low complication rate.

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اگر عثمانیوں پر کوہِ غم ٹوٹا تو کیا غم ہے
کہ خونِ صد ہزار انجم سے ہوتی ہے سحَر پیدا

اقبال

Yousaf Jan

ORIGINAL ARTICLE

Diagnostic Value of Modified Alvarado Scoring System in the Diagnosis of Acute Appendicitis and its Correlation with Histopathology

Yousaf Jan FCPS (Gen. Surgery)[1], Waqas MBBS[2], Shaukat Hussain MBBS[3]

ABSTRACT

Background: Acute appendicitis is a common surgical emergency and approximately 7% of the population will have appendicitis in their life time. Early diagnosis and prompt surgical treatment is necessary to prevent complications. The diagnosis of acute appendicitis is still based primarily on the clinical history examination, and the accuracy of clinical examination has been reported from 71 % to 97 %. The treatment being surgical, and various scoring systems are available for diagnosis to prevent the increasing negative appendectomy rate.

Objective: The aim was to evaluate the Modified Alvarado Scoring Systems in clinical practice for the diagnosis of acute appendicitis and its correlation by histopathology.

Material and Methods: This randomized controlled study was conducted in Agency Headquarter Hospital Landikotal from October 2012 to July 2013. 160 patients with suspected acute appendicitis were admitted in the ward and were evaluated on the basis of Modified Alvarado Scoring System. Decision regarding surgical intervention was made on the basis of change in the score.

Results: A total of 160 patients were included in the study. Among them, 105 (65.62%) were males and 55 (34.37%) were females. Age ranged from 11-60 years. Twelve patients had MASS of 1-4 and two out of them required surgery. Twenty two patients were in the score of 5-7, and fourteen out of them required surgery. One hundred and twenty six had score 8 and above , all of them underwent surgery. Out of 142 patients who required surgery, 132 patients had appendicitis on histopathology, yielding a positive predictive value of 92.95 %, while the rate of negative appendectomy was 7.05 %.

Conclusion: The study shows that use of modified Alvarado scoring system is a good diagnostic indicator in the diagnosis of suspected appendicitis as compared to simple clinical assessment and helps in minimizing negative appendectomy rates.

Key Words: Appendectomy, modified Alvarado scoring system (MASS).

INTRODUCTION

Acute appendicitis is one of the most common and challenging surgical emergencies, and can lead to appendicular perforation and peritonitis, which are concomitant with high morbidity and mortality.[1] In a lifetime 8.6% males and 6.7% females can be expected to develop acute appendicitis.[2]

The classical signs and symptoms of right lower abdominal pain, nausea and vomiting, having tenderness and guarding in right iliac fossa on examination were first reported by Fitz in 1886.[3] The diagnosis of acute appendicitis is primarily clinical, including history and physical findings, with additional help from laboratory tests.[4] However these signs and symptoms are not very specific for acute appendicitis and can mimic other acute abdominal emergencies.[5]

Early diagnosis and prompt operative treatment is the key for successful management of acute appendicitis. However the diagnosis of appendicitis in some cases may not be typical leading to delay in surgery and increasing complications rates like perforation and finally peritonitis.[6] A negative appendectomy rate of 20-40% has been reported in literature and many surgeons advocate early surgical intervention to avoid perforation, accepting a negative appendectomy rate of about 15-20%.[7] About 0.5-1% of appendectomy patients will later require surgery for intestinal obstruction caused by post appendectomy adhesions, and according to some studies the incidence of such adhesions may even be greater if the excised appendix is normal. Conversely the commonest cause of intra-abdominal adhesions in operated patients with intestinal obstruction is appendicectomy.[8]

Several diagnostic aids have been developed to improve diagnosis in suspected appendicitis and thus to avoid negative appendectomy rate.[9] The various methods to assist in the diagnosis of appendicitis include laparoscopy, ultrasonography, computed tomography, magnetic resonance imaging and scoring systems, but definitive diagnosis can however be reached at surgery and after histopathology. Graded compression Ultrasonography has been reported to have an accuracy of 71-95%, but it has been argued that findings at ultrasonography should not supersede clinical judgment in patients with a high probability of appendicitis.[10]

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Many scoring systems for the acute appendicitis diagnosis have been used, but most of them are not feasible in emergency due to complexity of the scoring system.[11] The Alvarado scoring system is based on history, physical examination and a few laboratory tests and is very simple, cheap, cost effective and easy to apply in emergency setup.[12] The Alvarado score was first described by Alfredo Alvarado in 1986, and was modified by Kalan et al by excluding one laboratory finding shift to left of neutrophil maturation.[13] In this study we assesses the diagnostic value of the Modified Alvarado Scoring System(MASS) for the diagnosis of the appendicitis in our local set up, comparing with the gold standard of histopathology and its usefulness in preventing negative appendectomies.

This study was conducted to evaluate the Modified Alvarado Scoring Systems in clinical practice for the diagnosis of acute appendicitis and its correlation by histopathology.

MATERIAL AND METHODS

This prospective randomized controlled study was conducted at Agency Headquarter Hospital Landikotal from October 2012 to July 2013. A total of 160 patients with suspected clinical acute appendicitis were included in the study after informed consent, including both males and females, with the age ranges of 11 – 60 years.

Inclusion Criteria: The followings were included in the study,

1: patients with clinically acute appendicitis
2: age ranged from 11 to 60 years.
3: Both males and females.

***Exclusion Criteria*:** The followings were excluded from the study,

1: mass in the right iliac fossa.
2: patients unwilling for surgery.
3: clinically urologic or gynaecological symptoms.
4: patients who had no pathological results.

All patients included in the study were assessed in the OPD and emergency department and a full detailed history and complete physical examination were performed. Routine set of investigations were sent including total and differential leukocyte count and random blood sugar. All patients were scored by modified Alvarado scoring system (Table 1) before admission and were placed into the following 3 groups based upon their scores.

Group-1: **(MASS 1-4):** These were discharged after initial assessment, with the advice to come back if symptoms persists or recur.

Group-2: **(MASS 5-7):** These were kept under strict observation and reassessed at 4-6 hourly intervals till the next 24-48 hours. If the score dropped to < 4, these were treated as in group 1, and if the score rose up to 8 or more they were operated.

Group-3: **(MASS 8-9):** All patients in this group underwent surgery.

All patients who needed surgery, after informed written consent underwent open appendectomy.A single dose of injection 1 gram ceftriaxone and a single 100ml Flagyl infusion were given 30 minutes before surgery. Grid iron incision was employed in majority of cases. Post operatively patients were kept nothing orally till 6 hours, with 2 more doses of injection ceftriaxone 1gram and 100 ml Flagyl in simple cases, and both were given for 5 days in gangrenous and perforated cases. Uncomplicated patients were discharged on 2nd postoperative day while those with complicated cases were kept till full recovery. All operated patient specimens were sent to histopathology for confirmation, and finally the scores were correlated with clinical, operative and histopathological findings of the removed appendix.

RESULTS

A total of 160 patients were included in the study. Among them, 105 (65.62%) were males and 55 (34.37%) were females. Age ranged from 11-60 years. 90 patients (56.25%) were in the age group of 11-20 years and 35 patients (21.87%) from 20-25 years in our study (Table-2). The symptoms and signs at presentation included pain in right iliac fossa (81.48%), nausea and vomiting (59.3%), anorexia (68.7%), rebound tenderness right iliac fossa (81.25%), elevated temperature in (65.62%), positive Rovsing sign (70.98%), positive obturator sign in (28.12%) cases. Regarding investigations, TLC was raised in 112 (70%) cases.

For the study, the patients were divided into three groups according to MASS; viz Group 1 (1-4), Group 2 (5-7) and Group 3 (8-9) score. Out of the 160 patients, twelve patients (7.5%) had MASS of 1-4, among them 8 (66.6%) were males and 4 (33.3%)females and two (16.6%) out of them required surgery. Of the operated patients one patient had normal appendix on histopathology report, yielding a negative appendectomy rate of 50%. Twenty two patients (13.75%) were in the score of 5-7, were admitted for observation and evaluation. Of these 15 (68.18%) were males and 7(31.81%) females. Fourteen (63.63%) out of them required surgery. Of operated patients, three (21.42%) out of 14 had normal appendix on histopathology report, yielding a negative appendectomy rate of 21.42% and 8 (36.36%) were discharged after 24 hours of observations. Out of 160 patients, one hundred and twenty six had score 8 and above, all of them underwent surgery. Of the 126 pa-

tients, 82 (65.07%) were males and 44 (34.92%) females. In group 3, out of 126 patients who underwent surgery, 120 patients (95.23%) had appendicitis confirmed by operative and histopathology report, and 6 (4.76%) had normal appendix on histopathology report, 4 were females and 2 were males, yielding a negative appendectomy rate of 4.76% in Group 3.Out of 142 operated patients, 10 patients had normal appendix on histopathology report, thus yielding a positive predictive value of 92.95% and negative appendectomy rate of 7.04 % in our study.

Mean hospital stay was 3.4 days (ranging from 1-10 days). All the patients who underwent surgery, the operated findings were inflamed appendix in 110 (77.46%), perforated appendix5 (3.52%), gangrenous appendix 7 (4.92%), and normal appendix in 20 (14.08%) cases (Table-3). Out of these 20 normal appendix on operative findings, 10 had histopathology confirmed appendicitis(Table 3). The underlying pathology in 10 patients with histopathology confirmed negative appendectomy included mesenteric adenitis in three patients, ruptured ovarian cyst in two patients, ovarian torsion in two cases, and no pathology was found in three cases (Table-3).

Table-1: Modified Alvarado scoring system (MASS)

Parameters	Manifestations	Score
Symptoms	Migratory pain Anorexia Nausea/vomiting	1 1 1
Signs	RIF tenderness Rebound tenderness Elevated temperature	2 1 1
Lab values	Leucocytosis	2

Table-2: Age and Sex distribution

Number of patients	Total (160)
Age in years	11-60
11-20	90(56.25%)
20-25	35(21.87%)
30-40	20(12.5%)
>40	15(9.37%)
Male	105(65.63%)
Female	55(34.37%)

Table-3: Operative Findings

Operative findings	Frequency	Percentage
Inflamed appendix	110	77.46%
Perforated appendix	5	3.52%
Gangrenous appendix	7	4.92%
Normal appendix	20	14.08%

Table-4: Histological findings

Histological findings	Frequency	Percentage
Normal appendix	10	7.04%
Acute appendicitis	120	84.50%
Chronic non specific Appendicitis	12	8.45%

Table-6: MASS versus Histological findings

MASS	Histological report		Total
	Appendicitis	Non appendicitis	
>7	120	6	126
<7	12	4	16
Total	132	10	142

DISCUSSION

Acute appendicitis remains a common abdominal emergency throughout the world. It causes a problem when the patient presents with right iliac fossa pain with equivocal signs. Decision making in acute appendicitis cases poses a clinical challenge in developing countries where advance radiological investigations do not appear cost effective, so clinical parameters remains mainstay of diagnosis, but misdiagnosis and negative appendectomy still do occur at quite a high rate.[14] Acute appendicitis may occur at any age, although it is relatively rare at the extremes of age, and the maximum incidence occurs in the second decade, as also shown in our study Table-2.

The decision to operate or not is very important as negative appendectomy has a mortality and morbidity of 10%.[15] None of the investigations like USG, CT, MRI can give a confirmatory diagnosis of acute appendicitis.[16] So a thorough clinical examination with basic investigations is one of the best diagnostic tools for acute appendicitis. For this reason surgeons and physicians have adopted different scoring systems in order to decrease negative appendectomy rates.

Table-5: Results of Alvarado Score in reference with sex, histo-pathological report

Alvarado score	Acute appendicitis		Non acute appendicitis		Other findings	
	M	F	M	F	M	F
1-4	1(50%)	0	0	1 (50%)	0	0
5-7	6(40%)	5(71.42%)	2(13.33%)	1(14.28%)	2	2
8-9	80(97.56%)	40(90.90%)	2(2.43%)	4(9.09%)	2	1
Total	87 (82.85%)	45(81.81%)	4(3.80%)	6(10.90%)	4	1

For this reason many scoring systems for the acute appendicitis diagnosis have been used, but most of them are not feasible in emergency due to complexity of the scoring system.[11] The Alvarado scoring system is based on history, physical examination and a few laboratory tests and is very simple, cheap, cost effective and easy to apply in emergency setup.[12] The Alvarado score was first described by Alfredo Alvarado in 1986, and was modified by Kalan et al by excluding one laboratory finding shift to left of neutrophil maturation.[13] The use of MASS in the diagnosis of appendicitis has been reported to improve the diagnostic accuracy and thus reduces negative appendectomy and complication rates.[11,17]

In this study we assesses the diagnostic value of the Modified Alvarado Scoring System (MASS) for the diagnosis of the appendicitis in our set up, comparing with the gold standard of histopathology and its us fulness in preventing negative appendectomies.In this study 160 patients were included, with 105 males and 55 females with age range of 11-60 years. In our study, appendectomy was decided on the basis of MASS criteria. According to MASS, patients with suspected appendicitis were divided into three groups with Group 1 (MASS 1-4), Group 2 (MASS 5-7), Group 3 (MASS 8-9). Group 1 included 12 patients and 2 of them underwent surgery, but only one of them had histo-pathologically confirmed appendix with negative appendectomy rate of 50%. In Group 2, out of total 22 patients only 14 needed appendectomy, but histopathology confirmed only 11 cases with 3 normal pathology report. The negative appendectomy rate in Group 2 was 21.42%. Group 3 included 126 patients and all underwent surgery with histopathology showed normal appendix in 6 patients, so negative appendectomy rate of 4.76%.Our study showed that patients with suspected appendicitis having MASS of 4 or less, have almost no appendicitis and thus no surgical intervention is required. While patients with score from 5-7 required observation and probably surgical intervention in most cases. Patients with score above 7, always required surgical intervention to decrease chances of complications like perforations.

Out of 142 operated patients, 10 patients had normal appendix on histopathology report in our study, yielding a positive predictive value of 92.95% and overall negative appendectomy rate of 7.04%. In one study Arain et al[18] recorded a positive predictive value of 85.5% comparable to my own study. Other studies,[19,11,20] also showed positive predictive value of 89.8%, 72% and 89.66% comparable to our own study. The negative appendectomy rate of 7.04% in this study is comparable to the result shown by various authors in their studies e.g., Arain et al[18] (14.3%), Ijaz et al[21] (16%), Haider et al[20] (10.34%), Harsha et al[22] (7.6%), Caren et al[23] (12%) respectively.

Mean hospital stay was 3.4 days (ranging from 1-10 days). All the patients who underwent surgery, the operated findings were inflamed appendix in 110 (77.46%), perforated appendix 5 (3.52%), gangrenous appendix 7 (4.92%), and normal appendix in 20 (14.08%) cases. Out of these 20 normal appendix on operative findings, 10 had histopathology confirmed appendicitis. The underlying pathology in 10 patients with histopathology confirmed negative appendectomy included mesenteric adenitis in three patients, ruptured ovarian cyst in two patients, ovarian torsion in three cases, and no pathology was found in two cases.

Limitations of our study is that no trained sinologist is available in Landikotal (rural area) as well as computed tomography, therefore we did not use these diagnostic tools in equivocal cases especially in females to exclude adnexal pathologies (5 cases in our study), which could be prevented by good ultrasound study. As no histopathologist is available in Landikotal, we sent all the specimens to the Shaukat Khanum laboratory Peshawar for confirmation.

In our present study, the usefulness of the MASS was demonstrated beyond doubt by correctly diagnosing acute appendicitis and by reducing the negative appendectomy rate and complications.

CONCLUSION

This study showed that Modified Alvarado scoring system is a good diagnostic indicator for acute appendicitis. It is easy, cost effective and quick to apply and helps in reducing the negative appendectomy rate. Therefore this scoring system may routinely be adopted to get help in the diagnosis of acute appendicitis especially in areas where other diagnostic tools like USG , CT scan are not available or cost effective in equivocal cases.

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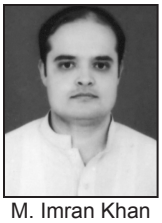
M. Imran Khan

ORIGINAL ARTICLE

Adhesive Capsulitis Shoulder: Role of Manipulation under General Anesthesia along with Intra-articular Steroid Injection

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Muhammad Saqib MBBS[3], Kamran Alamgir MBBS[4]

ABSTRACT

Objective: To observe the affects of manipulation under general anaesthesia (MUA) plus intra-articular steroid injection in patients with primary frozen shoulder.

Material and Methods: Fifty patients with idiopathic (primary) frozen shoulder, with unilateral involvement with minimum duration of six months were selected for this prospective study. The solution injected contained 5cc of 2% lidocaine HCl (xylocain) and 2cc (80 mg) methyl prednisolone acetate (depomedrol). All patients were injected once after manipulation under general anaesthesia. After the inra-articular injection, patients were advised to perform range of movements exercise within the limits of pain daily for as long as possible. They were asked to revisit out-patient department for follow-up at 1 week, 4 weeks and then at 12 weeks so that the outcome of treatment could be determined and recorded. Range of motions of the shoulder joint and pain at rest and during motion was taken in to account for diagnosis and follow up.

Results: Total of 50 patients ranging from 40 years to 60 years (mean 48.38) was evaluated, out of which 32% were female and 18% were male. All the active range of motion of the shoulder joints, pain at rest as well as during motion improved considerable as compared to before the procedure.

Conclusion: In patients with frozen shoulder, single MUA plus intra-articular injection of corticosteroid injection is effective in improving shoulder pain and disability.

Key Words: Frozen shoulder, Adhesive capsulitis, intra-articular steroid injection

INTRODUCTION

Adhesive capsulitis is a condition characterized by insidious pain and limitation of all the movements of the shoulder joint.[1] Duplay described it first in 1872, when he called it "périarthrite scapulo-humérale" a painful, stiffening condition of the shoulder. He suggested manipulation under anaesthesia as its treatment.[2] It was labeled as "frozen shoulder" by Codman in 1934 and he defined it a condition characterized by insidious onset, pain near the insertion of the deltoid, inability to sleep on the affected side, painful and restricted elevation and external rotation, but normal radiological appearance.[3] Later in 1945, Neviaser coined the term "adhesive capsulitis" based upon his findings of synovial changes in the glenohumeral joint.[4] The causes are largely unknown.[5] But the recognized risk factors for the disease are patients having diabetes mellitus, hyper or hypothyroidism, Parkinson's disease, cardiovascular illness and those whose shoulder is immobilized for prolonged period due to trauma.[6, 7]

Primary frozen shoulder has three clinical phases: (1) Painful phase, (2) Stiffening or frozen phase, (3) Thawing phase.[8] Etiology and the most suitable treatment of this condition are still not clear but various different modalities of treatments have been recommended and a large number of studies have demonstrated successful results. Types of treatment include supervised neglect, oral steroids, intra-articular injections, physiotherapy programmes, manipulation under anesthesia arthroscopic capsular release and open surgical release.[9]

This study has been conducted to evaluate the effectiveness of manipulation under anaesthesia followed by intra-articular corticosteroid (methylprednisolone) injection in the treatment of idiopathic frozen shoulder.

MATERIALS AND METHODS

This prospective study was carried out in Agency Headquarter Hospital Landikotal from May 2012 to May 2013. ***Inclusion*** criteria were;

1. No history of previous trauma to the shoulder
2. Age above 40 years
3. Normal blood sugar level
4. Unilateral involvement and cotra-lateral normal shoulder
5. Normal x-ray of the shoulder.
6. Duration of symptoms between 3-6 months

The patients were admitted via out-patient department in to orthopaedic unit. X-rays and baseline investigations were performed. Restriction of abduction, internal and external rotation and pain at rest and dur-

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ing motion were taken in to account for the diagnosis of frozen shoulder. Range of motion of the shoulder was measured with the goniometer in degrees except passive internal rotation of the shoulder which was assessed by bringing the hand behind and determining the vertebrae level that they could reach by the thumb. If the thumb reaches to hip joint then the score is 1, at S1 level it is 2, at L5 it is 3 and so on. Pain at rest and at extreme shoulder movements were evaluated using Visual Analogue Scale (VAS) in which '0' means no pain and at the other end '10' which means severe unbearable pain. These readings were taken before the treatment, at 1,4 and 12 weeks after the procedure. Shoulders were manipulated under general anaesthesia followed by intra-articular injection of a mixture of 2ml (80mg) methylprednisolone and 5ml lignocaine 2%. The patients were discharged next day and advised range of motion exercises. They were asked to revisit out-patient department for follow-up at 1 week, 4 weeks and then at 12 weeks so that the outcome of treatment could be determined and recorded. All the data were processed using SPSS. P value <0.05 was considered as level of significance.

RESULTS

A total of 58 patients were enrolled. Eight patients were lost to follow up at 4 weeks time and excluded. Total of 50 patients ranging from 40 years to 60 years (mean 48.38) were evaluated, out of which 32% were female and 18% were male. All the active range of motion of the shoulder joints improved considerably as compared to before the procedure at one week follow up. Pain at rest was also decreased in intensity but pain at activity did not decrease significantly. After 4 weeks all the movements of the shoulder joint, pain at rest as well as during activity improved markedly. Following the procedure with the home exercise program range of motion as well as reduction in the pain score improved even further at 12 weeks period (Table-I).

DISCUSSION

Frozen shoulder is one of the most common self limiting conditions seen in the out-patient department manifested by symptoms like pain and stiffness of the shoulder joint.[10] The term "Adhesive capsulitis" was reported by Neviaser in 1945 during surgery.[4]

Carette et al compared four treatments: intra-articular corticosteroid injection (under fluoroscopic control) plus physiotherapy, corticosteroid injection alone, saline injection plus physiotherapy, and saline injection alone. The authors concluded that intra-articular corticosteroids (with or without physiotherapy) significantly improved pain and disability at 6 weeks compared to saline injection plus physiotherapy or saline injection alone.[14]

Continuous passive motion and stretching exercises has shown more promising results as compared to this traditional practice.[12] Most noninvasive therapeutic strategies are based on stretching or rupturing the tight capsule by manipulative physical therapy with success rate for achieving good to fair results nearing 100.0%.[15] The good result of physical therapy with intra-articular corticosteroid injections, with or without hydraulic distension, ranges from 44.0% to 80.0%.[16] Khan et al[17] used a combined approach (Intra-articular injection of local anesthesia with corticosteroid plus coraco-humeral infiltration plus supra-scapular nerve block plus gentle manipulation and active assisted range of motion exercises) in the management of frozen shoulder. They have achieved significant improvements in the range of motion as well as relief of pain in patients. Ahmad I et al[18] in an another study observed an average improvement in pain as per VAS of 4.5 (from 7.5 to 3) in twelve weeks follow-up time. The range of motion similarly improved; abduction from 60 degrees to 95 degrees (average gain 35 degrees) and internal rotation from 20 degrees to 40 degrees (average gain 20 degrees). All these studies produce comparable results to our study. These studies have pointed out that intra-articular steroid injection is an effective mode of therapy in frozen shoulder, given with or without physiotherapy.[14,16,18]

Intra-articular steroid injection is quite effective in FS in short term follow-ups as obvious from the literature but whether its effect persist in the long term is yet to be established.[11] Very few studies on the long term effect of this mode of treatment are available like the one of Dudkiewicz I et. al (2004).[13] In their study of 54 patients, with mean follow up of 9.2 years, claimed that conservative primary treatment for frozen shoulder i.e., physiotherapy and intra-articular steroid injection was an effective long term treatment method.[13]

CONCLUSION

Manipulation under anaesthesia and Intra-articu-

Table-I: Final outcome of the study

Time	Abduction	Int. rotation	Ext. rotation	Pain at rest	Pain at motion
Pre-procedure	45.45	2.79	13.30	6.65	7.22
1 week	140.50	5.58	39.77	5.58	7.31
4 weeks	160.85	7.95	55.49	1.1	2.12
12 weeks	163.35	11.85	61.33	0.7	0.95

lar steroid plus local anaesthetic injection is a useful option in patients with frozen shoulder, at least in the short term. Studies with large sample size and of long duration are required to find out the effectiveness of this mode of treatment in long term basis. Moreover comparative studies among local anaesthetic, steroid injection and manipulation under anaesthesia are also required to see which one among these three is most effective in frozen shoulder.

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Siddique Ahmad

ORIGINAL ARTICLE

Management of Duodenal Injuries: Our Experience at a Tertiary Care Hospital

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ABSTRACT:

Background: Duodenal injury is an uncommon finding, accounting for about 3-5% of abdominal trauma, mainly resulting from both penetrating and blunt trauma, and is associated with significant mortality (6-25%) and morbidity (30-60%).

Objective: The aim of this study was to report our experience with duodenal injuries management and outcome of different procedures performed for both penetrating and blunt duodenal trauma.

Material and Methods: This study was conducted in Hayatabad Medical Complex Peshawar, Pakistan from February 2008 to August 2012 after obtaining permission from local research and ethical committee. Fifty five patients who underwent surgery for duodenal injuries were included. Management of duodenal injury was classified as primary repair, tube decompression and more complex procedures like pyloric exclusion and Roux-en-Y duodeno-jejunostomy.

Results: During the study period, out of 55 patients, 38 (69%) were injured by penetrating trauma (33 gunshot wounds, 5 stab wounds) and 17 (31%) by blunt trauma. There were 42 males and 13 females with M:F ratio of 3.2:1 as shown in (Table 1). 27 patients (49%) presented in hypovolemic shock. The most common injury site was in the second part of the duodenum (20 of 55, 36.4%). The remaining injuries were distributed anatomically as follows: first part, 16 patients (29%), third part, 13 patients (23.7%) and fourth part, 6 patients (10.9%). None of these wound involve the ampullary complex.

Twenty eight patients (50.9%) suffered grade II duodenal injuries, fourteen patients (25.4%) grade 111 duodenal injuries, nine patients (16.4%) grade 1V injuries and four patients (7.3%) had grade 1 injuries respectively. No grade V injury was noted. Out of 55 patients, 8 (14.5%) suffered combined pancreatico-duodenal injuries. Five patients (9%) had duodenal leak with fistula postoperatively, 2 with grade 111 injuries and 2 with grade 1V injuries. Two patients (3.6%) with combined pancreatico-duodenal injuries had pancreatic fistula postoperatively which were managed conservatively. Four patients (7.2%) developed sepsis, of which two were recovered completely. Five patients (9%) died postoperatively, 2 with duodenal leak, 2 with sepsis and one with associated major injuries.

Conclusion: The surgical management of duodenal injury is complex but majority of duodenal injuries is suitable for primary repair. Associated organ injuries and delayed presentation to hospital are the main determinants of increased morbidity and mortality in duodenal injury.

Keywords: duodenal injury, abdominal trauma, primary repair.

INTRODUCTION

Duodenal injuries are seen with much greater frequency compared to 40 years ago due to the increased incidence of automobile accidents and violent assaults.[1] Patients with duodenal injuries represents approximately 3-5% of all patients with abdominal injuries form blunt trauma, usually resulting from motor vehicle accidents, which accounts for 22% of all patients with duodenal injuries.[2] In contrast to 70% injuries to duodenum in adults are penetrating, majority of child duodenal injuries are secondary to blunt trauma.[3]

Isolated duodenal injuries are very rare due to the deep and relatively well protected anatomical site of the duodenum. The majority of duodenal injuries are caused by penetrating trauma, however blunt injuries though infrequent are difficult to diagnose because patients may have subtle findings on admission. Most duodenal injuries are accompanied by other intra-abdominal injuries because of the close anatomic relationship of the duodenum with other solid organs and major vessels.[4] Duodenum related morbidity ranges from 12% to 63%and the mortality rates range from 6% to 23%.[5] Most patients with duodenal injuries may exhibit epigastrium/right upper quadrant pain, progressive tachycardia and vomiting, but peritoneal signs are often delayed several hours as duodenal contents slowly seep into the peritoneal cavity.

Several imaging modalities have been demonstrated to be helpful in diagnosing blunt duodenal injury, including abdominal plain films, ultrasound and computed tomography (CT) imaging with oral and intravenous contrast. Classic signs of duodenal injury on plain films include retroperitoneal air outlining the lateral duodenum and right kidney, a partially obscured upper portion of the right psoas muscle, and lumbar spinal scoliosis to the left. However CT scan with contrast has more recently become a widely used modality in diagnosing and assessing the severity of blunt duodenal injuries. Shilyanskyet al[6], demonstrated the abil-

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ity of contrast enhanced CT scan to differentiate duodenal haematoma and from perforation.

As the diagnosis of a patient with blunt duodenal injury is difficult, and even though there are many laboratory tests and radiological studies available, laparotomy with exploration of the retroperitoneal space remains the decisive diagnostic procedure.[7] Appropriate treatment of such injuries is hampered both by potential delay in diagnosis and by the controversial nature of optimal surgical management. An array of surgical techniques has been developed for the management of patients with duodenal injuries. The surgeon should choose the most efficient technique according to the type and conditions of the patient's injury.[2]

The management of more complex duodenal injuries is controversial. Debridement and primary repair or resection and anastomosis are suitable for the majority of duodenal injuries especially for penetrating injuries.[8] However, duodenal fistulisation and increased morbidity related to complex duodenal injuries have prompted surgeons to protect the duodenal suture line[1].Various methods of staging duodenal injuries have historically been proposed to assist with this decision, including the duodenal Injury Severity Scale proposed by Moore et al,[9] as shown in Table 1.

We are going to present our experience of both penetrating and blunt duodenal injuries and their management admitted to our institution during the above period.

Table-1: Duodenal Injury Scale[9]

Grade	Injury
1.	**Hematoma:** involving single portion of the duodenum **Laceration:** partial thickness, no perforation
11.	**Hematoma:** involving more than one portion **Laceration:** disruption <50% of the circumference
111.	**Laceration:** disruption 50%-75% of the circumference of D2 disruption 50%-100% of the circumference of D1, D3, D4
1V.	**Laceration:** disruption >75% of the circumference of the D2 Involving the ampulla or distal common bile duct
V.	**Laceration:** Massive disruption of the duodenopancreatic complex **Vascular:** Devascularisation of the duodenum

MATERIAL AND METHODS

After having permission from the Ethical committee of the hospital, this prospective study was conducted at Hayatabad Medical Complex Peshawar from February 2008 to August 2012. A total of fifty five patients with duodenal injuries from both penetrating and blunt traumas needed surgical intervention that aged between 8 to 70 years and both genders were included. Duodenal hematoma that did not require intervention was excluded.

All patients were admitted in the ward through an Accident and Emergency Department and were initially stabilized in the ward. Data were collected regarding patient characteristics, type of injury (blunt/ penetrating),presence of shock during admission (systolic blood pressure ≤90mmHg) transfused blood units within first 24 hours, length of hospital stay and outcome

All patients underwent immediate laparotomy after stabilization. A single dose injection ceftriaxone was given at the time of anaesthesia induction. Details were collected regarding injury severity [defined by the Injury Severity Score (ISS and Revised Trauma Score (RTS)], number of associated intra and extra abdominal organ injuries, operative findings including details about the grade and site of duodenal injury and surgical intervention. Pancreatic injury was graded according to the Organ Injury Scaling (OIS) Committee of the AAST9. Antibiotics were continued in the postoperative period. All patients had peritoneal drainage by a drain placed in the vicinity of the duodenal suture line.

Duodenal injuries were diagnosed and graded during laparotomy in all patients. Operative repair was dictated by surgeon preference. Management of duodenal injuries was classified as either primary repair (debridement with simple closure and resection with anastomosis) or tube decompression (ante grade or retrograde tube duodenostomy). Duodenal injuries suitable for primary repair were closed in two layer suture. Complete transactions, large lacerations or injuries involving loss of a portion of the duodenal wall were treated with resection and primary anastomosis in two layers. Tube duodenostomy was inserted where needed with primary repair. A duodenal fistula was defined as drainage with both an amylase and bilirubin content greater than that of serum. A pancreatic fistula was defined as being >50ml of high amylase containing fluid per day. Postoperatively patients were followed in the ward and out-patient department after discharge for six weeks for any complications. Data was analysed using SPSS version 11 for windows. Statistical analysis was performed by using the unpaired Student's t-test.

RESULTS

During the study period, out of 55 patients, 38 were injured by penetrating trauma (33 gunshot wounds, 5 stab wounds), and 17 by blunt trauma. There were 42 males and 13 females with M:F ratio of 3.2:1 as shown in (Table 2). 27 patients (49%) presented in hypovolemic shock, as defined by a systolic blood pressure of less than 90mmHg (Table 2).

The most common injury site was in the second part of the duodenum (20 of 55, 36.4%). The remaining

injuries were distributed anatomically as follows: first part, 16 patients (29%), third part, 13 patients (23.7%) and fourth part, 6 patients (10.9%). None of these wound involve the ampullary complex as shown in (Table 2).

Table-2: Characteristics of patients with duodenal injury

Gender	Male Female	42 (76.3%) 13 (23.7%)
Mechanism of injury	Penetrating Blunt	38 (69%) 17 (31%)
Hypovolemic shock	Present Absent	27 (49%) 28 (51%)
Duodenal injury site	D1 D2 D3 D4	16 (29%) 20 (36.4%) 13 (23.7%) 6 (10.9%)

Table-3: Associated intra-abdominal organ injuries

Organ damaged	Percentage
Liver	32 (58.1%)
Colon	24 (41.3%)
Stomach	20 (36.2%)
Small bowel	19 (34.5%)
Pancreas	8 (14.5%)
Kidney	7 (12%)
Gallbladder	4 (7.2%)

Table-4: Complications and outcomes of duodenal surgery

Complications	Percentage
Duodenal fistula	5 (9%)
Pancreatic fistula	2 (3.6%)
Sepsis	4 (7.2%)
Mortality	5 (9%)

We observed that epigastric pain and vomiting was the key presentation in this series occurring in 100% of patients, whereas back pain 24 (43.6%), distension of abdomen 21 (38.1%), and peritonitis in 19 (34.5%) patients.Concomitant intra-abdominal injuries were present in all the patients.The Liver (58.1%) was the most commonly injured organ, followed by colon (41.3%), stomach (36.2%), small bowel (34.5%), pancreas (14.5%), kidney (12%) and gallbladder (7.2%) as shown in (Table 3). Out of 55, 44 patients (80%) presented within 24 hours of trauma and 11 (20%) after 24 hours of trauma.

Twenty eight patients (50.9%) suffered grade 11 duodenal injuries, fourteen patients (25.4%) grade 111 duodenal injuries, nine (16.4%)grad 1V injuries and four patients (7.3%) had grade 1 injuries. No grad V injury was noted. Out of 55 patients, 8 (14.5%) suffered combined pancreaticoduodenal injuries. So out of total 55 patients, 41 (74.5%) underwent primary repair, 8 (14.5%) primary repair with tube duodenostomy, 3 (5.4%) pyloric exclusion and 1 (1.8%) Roux-en-Y duodenojejunostomy.

Five patients (9%) had duodenal leak with fistula postoperatively, 2 with grade 111 injuries and 2 with grade 1V injuries. Two patients (3.6%) with combined pancreaticoduodenal injuries had pancreatic fistula postoperatively which were managed conservatively. Four patients (7.2%) developed sepsis, of which two were recovered completely. Five patients (9%) died postoperatively, 2 with duodenal leak, 2 with sepsis and one with associated major injuries. The average length of the hospital stay for the series was 8 days.

DISCUSSION

Historically, duodenal injuries were often treated aggressively with such technically complex procedures as duodenal diverticulization which was first described by Donovan and Hagan,[10] in 1966 for higher grade lesions. More modern trends in operative repair demonstrated value in simpler options, including pyloric exclusion and gastrojejunostomy, or primary repair with or without tube duodenostomy.[11] The current literature showed that Grade 1 injuries may be treated without surgical intervention unless laparotomy is indicated for other indication.[11,12] Higher grade injuries are increasingly being treated with primary repair, rather than more complex methods of diversion.

Duodenal injury management is a challenging problem in acute surgery because of the complex treatment and infrequent occurrences. Duodenal injury is the indication for 3.7% of all laparotomies for trauma and is rarely an isolated injury.[13] The treatment of duodenal injuries is based on the underlying aetiology, severity of the injury, associated injuries to the intra and extra abdominal organs, and time of presentation after trauma.[14]

Out of 55 patients, 38 (69%) were injured by penetrating trauma (33 gunshot wounds, 5 stab wounds), and 17 (31%) by blunt trauma, as compared to 57% and 43% incidence of duodenal injuries by penetrating and blunt trauma in a study by Panday S, et al.[15] There were 42 males (76.3%) and 13 females (23.7%) with M:F ratio of 3.2:1 in our study as shown in (Table 1) as compared to M:F ratio of 5:1 by Girgin S, et al in his study.[16] 27 patients (49%) presented in hypovolemic shock, as defined by a systolic blood pressure of less than 90mmHg (Table 2), as compared to 33% patients presented in hypovolemic shock with duodenal injuries.[16] The second part of the duodenum D2 (20 of 55, 36.4%) was the most common site of injury, followed by first part (D1) 16 (29%), third part (D3) 13 (23.7%) and fourth part (D4) in 6 patients (10.9%). None of these wounds involve

the ampullary complex. In comparison second part of duodenum (D2) was involved in 58%[15] and 34%[16] of patients respectively.

In our study concomitant intra-abdominal injuries were present in all the patients. The Liver (58.1%) was the most common associated injured organ, followed by colon (41.3%), stomach (36.2%), small bowel (34.5%), pancreas (14.5%), kidney (12%) and gallbladder (7.2%). Liver was also the most common organ injured in their studies by Girgin. Et al[16] (55%) and Panday S, et al[15] (57%) comparable to our current study. Out of 55, 44 patients (80%) presented within 24 hours of trauma and 11 (20%) after 24 hours of trauma.

Regarding grading of duodenal injury, twenty eight patients (50.9%) had grade 11 duodenal injuries, fourteen patients (25.4%) grade 111 duodenal injuries, nine patients (16.4%) grad 1V injuries and four patients (7.3%) had grade 1 injuries. No grad V injury was noted. Out of 55 patients, eight (14.5%) suffered combined pancreaticoduodenal injuries. In a study by Girgin S, et al[16], 43% suffered grade 11 injuries, 45% grade 111 injuries, 15% grade 1V injuries and 29.8% combined pancreaticoduodenal injuries respectively. No isolated duodenal injury occurred in our study.

Regarding management of duodenal injuries, 25 out of 28 patients with grade 11 injuries, primary repair was done without any tube duodenostomy. In remaining 3 patients tube decompression were done along with primary repair due to friable duodenum wall. Regarding grade 111 injuries, 9 out of 14 patients had primary repair without tube decompression, 3 needed tube duodenostomy along with primary repair and in 2 patient's pyloric exclusion were done due to tissue inflammation and technical difficulty in suturing the friable tissues. In grade 1V injuries, 5 out of 9 patients underwent primary repair successfully, 2 needed tube decompression along with primary repair, one had pyloric exclusion and one patient underwent Roux-en-Y duodenojejonostomy. In patients with grade 1 injuries, 2 out of 4 patients did not responded to conservative measures and underwent primary repair successfully. No grade V injury was noted in our study.

Regarding combined pancreaticoduodenal injuries, 5 out of 8 patients had primary duodenal repair while 3 needed tube decompression along with primary repair. Head of pancreas alone was injured in 5 cases, body alone in 2 cases and whole pancreas in one case with no pancreatic duct disruption in any case. Retroperitoneal oedema and hematoma were present around the pancreas and duodenum in 6 out of 8 pancreaticoduodenal injuries. Pancreatic injuries were repaired primarily after removing non -viable portion of pancreas. All 55 patients had duodenal area drained with tube postoperatively.

Morbidity and mortality rates following trauma to the duodenum continue to be higher and approximately 80% of the duodenal injuries can be safely repaired primarily and the remaining 20% of severe injuries needed more complex procedure.[13] Pylorus exclusion is the operation of choice in delayed surgical treatment due to tissue inflammation, technical difficulty in suturing of perforations and lacerations or resection, and possibility of extensive retroperitoneal abscess formation[17]. In our study 3 patients (5.1%) underwent pyloric exclusion, as compared to 6% patients in a study by GirginS,et al.[16] Carrillo et al,[11] reported that Roux-en-Y duodenojejunostomy provides an acceptable alternative for Grade 111 lesions, creating a mucosa to mucosa anastomosis that functions especially well in repairing larger defects in the D2 segment. One patient in our study had Roux-en-Y duodenojejonostomy for grade 1V injury.

Complications such as fistula formation and postoperative chest infection, are most common after the repair of duodenal injuries (2-14%).[14] In our study five patients (9%) had duodenal leak with fistula postoperatively, 2 with grade 111 injuries and 2 with grade 1V injuries. Two patients (3.6%) with combined pancreaticoduodenal injuries had pancreatic fistula postoperatively which were managed conservatively. Eight patients (14.5%) developed postoperative chest problems, 5 atelectasis, 2 pneumonia and 1 pleural effusion respectively. Four patients (6.8%) developed sepsis, of which two were recovered completely. Five patients (9%) died postoperatively, 2 with duodenal leak, 2 with sepsis and one with associated major injuries. In a study by Girgin S etal,[16] 13.4% patients developed duodenal fistulas, 7.4% had pancreatic fistulas and 10.4% died postoperatively. The average length of the hospital stay for the series was 8 days, as compared to average length of hospital stay in their studies by Panday S,et al[15] and Smiley K, et al[18] of 10-14 days and 11 days respectively. The post-operative complications and increased length of hospital stay were more in the patients who had presented in the hospital after 24 hours and had associated other organ injuries.

CONCLUSION

The surgical management of duodenal injury is complex but majority of duodenal injuries is suitable for primary repair. Associated organ injuries and delayed presentation to hospital are the main determinants of increased morbidity and mortality in duodenal injury.

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Waheedullah

ORIGINAL ARTICLE

Validity of "Model for End Stage Liver Disease" (MELD-Na) Scores in Predicting 3 Months Mortality following Acute Variceal Bleeding in Patients having Cirrhosis due to Hepatitis causing Mortality after 3 months as a Gold Standard

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ABSTRACT:

Objective: To determine the frequency of high model for end stage liver disease score and its three months mortality among patients presenting with variceal bleeding due to liver cirrhosis with hepatitis C. In Pakistan limited work has been done on MELD and MELD-Na score. We therefore aim to apply MELD-Na scoring system as predictor of short term outcome in patients who are having end stage liver disease secondary to chronic hepatitis C and presenting with acute variceal haemorrhage.

Study design: Descriptive case series.

Duration: The duration of study was six months after approval of synopsis.

Settings: Department of Gastroenterology and Hepatology Hayatabad Medical Complex Peshawar.

Material & Methods: This study was conducted on 151 patients. All of them had end stage liver disease secondary to chronic hepatitis C and presented to the department of gastroenterology and hepatalogy with acute variceal hemorrhage Patients were admitted through emergency and outpatient department. MELD Na score was calculated at the time of arrival and these patients were contacted either by phone or advised followed up after 3 months. The outcome (survival or death) of each patient with chronic severe hepatitis C was recorded. The end point of observation was 3 months. The inclusion and exclusion criteria's were strictly observed. This study was in accord with current ethical guidelines and hospital ethical committee.

Results: This study was conducted in Department of Gastroenterology and hepatology Hayatabad Medical Complex, Peshawar. A total of 151 patients were included. All of them had end stage liver disease secondary to chronic Hepatitis C. Mean MELD - Na score in my study was 35±8. Of the 151 patients 92 (61%) were males and 59 (39%) were female. Out of 92 males, 69 (75%) died while out of 59 female 44 (64%) died within the study period. High MELD - Na Score was observed in 121 (80.1%) patients while 30 (19.9%) patients had low MELD - Na score. Out of 151 total patients 113 (74.8%) died within the study time period, most of the death occurred in those who has a MELD-Na score of 30 and above and who had age of 60±5 years.

Conclusion: In conclusion, it has been proven that MELD Na Score, which is an accurate and objective measure of liver disease severity, is also a significant and strong predictor of short-term mortality after an AVH.

Key words: HCV, Cirrhosis, Acute variceal hemorrhage, MELD Na Score.

INTRODUCTION

Viral hepatitis is a major public health problem.[1] Up till now about 8 strains of viral hepatitis have been discovered. A, B, C, D, E, F, G, H. Hepatitis C is the commonest among these in all over the world particularly in Pakistan. It is estimated that about 3% of the world's population has been infected by HCV. The prevalence of HCV in Pakistan is 4-6%.[2]

It is transmitted primarily by blood and blood products. Widespread use of injectable therapies and injection drug use are important risk factors for HCV infection. Progression to chronic liver disease, cirrhosis and hepatocellular carcinoma are frequent in HCV infected person.[3] Cirrhosis is characterized by replacement of liver tissue by fibrosis, scar tissue and regenerative nodules, 20% to 30% patients of chronic hepatitis C develop cirrhosis. Its common complication are ascitis, esophageal varices, upper GI bleeding and hepatic encephalopathy.[4]

Variceal hemorrhage occurs in 15-35% of patients with cirrhosis. The majority of bleeding episodes occurs within the first year of diagnosis of cirrhosis. Bleeding from esophageal varices is associated with 15-20% early mortality and accounts for one third of all deaths.[5]

Model for end stage liver disease (MELD) is a scoring system that is used to predict survival in patients with cirrhosis.[6] Model for End-Stage Liver Disease (MELD), originally developed in a cohort of cirrhotic patients undergoing non-emergent Tran jugular Intrahepatic Porto systemic Shunt (TIPS), is a commonly applied risk prediction tool as it effectively predicts short-term mortality.[7] Multiple studies have shown that addition of serum sodium concentration improved the

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predictive accuracy or MELD in hyponatremic patients with low MELD scores.[8,9,10,11]

The 3-month mortality of the MELD scores groups, 25–30, 31–34 and ≥35 were 15.7%, 50.0% and 77.1% respectively. High MELD Na score has a frequency of 23.23% among patients with variceal bleed due to liver cirrhosis. The MELD score has the advantage over the traditional child pugh score, based on objective and readily available variables (serum bilirubin, INR of prothrombin time and serum creatinine) rather than on subjective assessment of the degree of clinical abnormalities, without universally accepted definitions.[12]

Both the chronic hepatitis C and liver cirrhosis is quite common in our population and lack of essential health facilities puts these patients to a threat of complications like variceal bleed. The current study is designed to determine the high MELD score and its three months mortality among patients with acute variceal bleed due to liver cirrhosis.

This type of study is never attempted before in our local population and the results of this study will provide us with local statistics about high MELD score and its mortality. The results of this study will be compared with already available literature, studies and also shared with other health professionals and if found to be significant we will advice further research work into the MELD scoring system and its outcome.

MATERIALS AND METHODS

Setting of Study: Department of Gastroenterology and Hepatology Hayatabad
Medical Complex, Peshawar.

Study Design: Descriptive case series.

Duration of study: 6 Months.

Sample Size: Sample size was 151 using 50% proportion of mortality among patients with MELD score of 31-35[5,] 95% confidence level and 8%margin of error under WHO software for sample size determination.

Sampling technique: Non-probability consecutive sampling.

Sample Selection

Inclusion Criteria

- All patients who are aged 13 years or above of either gender.
- Patients have cirrhosis due to hepatitis C manifesting as acute variceal bleeding.

Exclusion Criteria

- Liver cirrhosis due to other causes like chronic hepatitis B, primary biliary cirrhosis, autoimmune hepatitis, Wilson's disease, hemochromatosis and alcoholic liver disease.
- Patients with a history of diarrhea, vomiting, diuretics use, heart failure, syndrome of inappropriate anti diuretic hormone secretion (SIADH), hypothyroidism, and acute or chronic renal failure. (diagnosed on history and medical records)

The above mentioned conditions act as confounders and if included will introduce bias in the study results.

RESULTS

This study was conducted in Department of Gastroenterology and hepatology Hayatabad Medical Complex, Peshawar. A total of 151 patients were included. All of them had end stage liver disease secondary to chronic Hepatitis C. Mean MELD - Na score in my study was 35±8. Of the 151 patients 92 (61%) were male and 59 (39%) were female.

Out of 92 males 69 (75%) died while out of 59 female 44 (64%) died within the study period. High MELD - Na Score was observed in 121 (80.1%) patients while 30 (19.9%) patients had low MELD - Na score. Out of 121 patients of high MELD score 83 (69.59%) died within the study time period, Most of the death occurred in who has a MELD Na score of 30 and above and who has age of 60±5 years.

Table-1: mean and standard deviation of age(n=151)

		age
No	Valid	151
	Missing	0
Mean		47.9073
Std. Deviation		1.36124E1
Minimum		19.00

Table-2: age distribution (n=151)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<= 30.00	25	16.6	16.6	16.6
	31.00 - 45.00	25	16.6	16.6	33.1
	46.00 - 60.00	75	49.7	49.7	82.8
	61.00+	26	17.2	17.2	100.0
	Total	151	100.0	100.0	

Table-3: gender distribution (n=151)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	92	60.9	60.9	60.9
	Female	59	39.1	39.1	100.0
	Total	151	100.0	100.0	

Table-4: high meld score (n=151)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	121	80.1	80.1	80.1
	No	30	19.9	19.9	100.0
	Total	151	100.0	100.0	

Table-5 : frequency of mortality (n=151)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	113	74.8	74.8	74.8
	No	38	25.2	25.2	100.0
	Total	151	100.0	100.0	

DISCUSSION

Pakistan has a population of 170 million people with low health and poor educational facilities.10 million people are presumed to be infected with HCV in Pakistan. Hepatitis C is rapidly emerging as a major health problem in developing countries including Pa-

Table-6: association of mortality with age groups and gender (n=131)

			Mortality		Total
			Yes	No	
age (in year)	<= 30.00	Count % within age (in year)	16 64.0%	9 36.0%	25 100.0%
	31.00 - 45.00	Count % within age (in year)	16 64.0%	9 36.0%	25 100.0%
	46.00 - 60.00	Count % within age (in year)	60 80.0%	15 20.0%	75 100.0%
	61.00+	Count % within age (in year)	21 80.8%	5 19.2%	26 100.0%
Total		Count % within age (in year)	113 74.8%	38 25.2%	151 100.0%
			Mortality		Total
			Yes	No	
Gender	Male	Count % within Gender	69 75.0%	23 25.0%	92 100.0%
	Female	Count % within Gender	44 74.6%	15 25.4%	59 100.0%
Total		Count % within Gender	113 74.8%	38 25.2%	151 100.0%

Table-7: association of (high meld score) mortality with age groups and gender (n=121)

Age wise Stratification of accuracy		accuracy		Total
		Yes	No	
age (in years)	<= 30.00	16 13.2%	3 2.5%	19 15.7%
	31.00 – 45.00	19 15.7%	2 1.7%	21 17.4%
	46.00 – 60.00	52 43.0%	8 6.6%	60 49.6%
	61.00+	21 17.4%	0 .0%	21 17.4%
Total		108 89.3%	13 10.7%	121 100.0%

		Accuracy		Total
		Yes	No	
Gender	Male	67 55.4%	8 6.6%	75 62.0%
	Female	41 33.9%	5 4.1%	46 38.0%
Total		108 89.3%	13 10.7%	121 100.0%

kistan. There is a high frequency of HCV seropositive individuals of both sexes among patients referred for chronic liver disease from different parts of Pakistan both urban and rural and among all socioeconomic classes. This study reviewed the prognostic value of MELD Na scores in patients with end stage liver disease due to HCV. To predict the prognosis of patients having cirrhosis and presents with complications of chronic hepatitis C is of paramount importance for the clinicians.[3] Different predictive models are used to assess prognosis in cirrhotic patients. Among these child-Pugh Score (CTP), MELD and MELD Na are widely used.

The Child-Pugh score though quite useful to predict outcome in cirrhotic patients but as already mentioned has certain limitations and short comings like some of the parameter, it contains, are subjective and it can't be calculated beyond the figure of 15. Secondly, it is not useful for predicting outcome or prognosis in cirrhotic who present with a single complication like upper GI bleed or SBP and encephalopathy rather it calculate overall prognosis.

MELD score was adopted in 2002 as standard for prioritizing organ allocation for liver transplantation, and to predict short term mortality in these patients. It is also a validated tool for predicting mortality in patients presenting with various complications of cirrhosis such as hepatic encephalopathy, variceal bleed, ascites etc. The MELD score has advantage over conventional CTP score due to readily available and objective variables (serum bilirubin, INR, and serum creatinine). This study of 3 month mortality was found to be correlated with MELD scores.

The prognostic accuracy of MELD scores may be improved by addition of serum sodium, which is readily available and objective laboratory test. As liver cirrhosis progresses, there is fall in serum sodium concentration and many of these patients develop hypervolumic, hyponatremia and patients have low serum sodium with expanded extracellular volume ascites and edema. Hyponatremia has been associated with the hepatorenal syndrome, ascites and death from liver disease. This makes serum sodium an important predictor of mortality. With the addition of Na to MELD, MELD-Na is created which has better prognostic accuracy as compared to MELD.

The major finding of this investigation is the demonstration that MELD Na is a clinically useful and objective predictor of short term survival after AVH. We found that MELD Na is significantly predictive of mortality in patients with cirrhosis who are hospitalized with an acute variceal bleed, with every 1-point increase in the MELD Na score conferring 5% to 8% increased risk of death at short term follow up. Our findings are consistent with a previously published data and studies on the utility of the MELD Na scoring system in patients with acute variceal bleeding. MELD Na scores were useful as short term predictors of mortality in these patients with end stage liver disease. Patients with higher Meld scores had higher mortality at 3 months as compared to patients with lower MELD Na scores. A total of 151 patients were enrolled. All of them had end stage liver disease secondary to chronic Hepatitis C. and their MELD-Na scores were calculated at time of recruitment.

Mean MELD - Na score in my study was 35±8. Most of my patients had high MELD-Na score and one of its reason is that most of the patients present late in the course of their disease when the disease reached to an advanced stage. There are two reason for this late presentation. First one is lake of education so each of cirrhotic patients has three to five visits to ***hakeems and quakes*** before the present to proper place and second reason is poverty.

Most of my patients were from far flung areas of Pakistan and Afghanistan which is a war hit zone and living as IDP and refugees. These people face hardships and difficulties to bring their patients in time so much of them have other complications of cirrhosis at the time of presentation as well. Of the 151 patients 92 (61%) were male and 59 (39%) were female. The reasons why male are more than the females. Their rate of exposure to get infected with HCV is more than female like addiction, shaving with used razor in barber shop and re-cycling of used syringes etc.

Out of 92 males 69 (75%) died while out of 59 female 44 (64%) died within the study period. High MELD - Na Score was observed in 121 (80.1%) patients while 30 (19.9%) patients had low MELD - Na score. Out of total 151 patients 113 (74.5%) died within the study time period, most of the death occurred in those who has a MELD-Na score of 30 and above and who has age of 60±5 years.

Our study also showed that age was also significant variable in predicting short term mortality in patients with end stage liver disease; with mean age of 60±5 in expired group and 30±8 in survival group (p 0.005). Thus increasing age is associated with poor short term outcome in cirrhotic patients, because most of them had other complications like HRS, resistant ascites and protein calories malnutrition. Serum sodium was also low in expired patients as compared to survival group with mean value of 125±4 mq / l. Sr. Sodium is an independent risk factor for predicting mortality.

Recommendations

Hepatitis C is the commonest cause of cirrhosis in our patients, there is no vaccines available to date for chronic hepatitis C virus infection and so efforts should be made to reduce transmission rate of hepatitis C by educating patients , eliminating poverty by saying **NO to War** and also to screen the population for viral hepatitis so that suitable candidates could be treated with anti-viral therapy to reduce the incidence of end stage liver disease and cirrhosis in our population as end stage liver disease is associated with poor outcome especially in patients with higher MEL-Na scores.

CONCLUSION

From this study it has been proven that MELD-Na score is highly accurate to predict short term mortality in patients who are having advanced liver cirrhosis and present with acute variceal bleeding.

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Yousaf Jan

ORIGINAL ARTICLE

The Etiological Spectrum of Obstructive Jaundice and Treatment Outcome

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ABSTRACT:

Background: Obstructive jaundice poses diagnostic and therapeutic challenges to general surgeons practicing in resource-limited countries.

Objective: To evaluate the causes, presentation and treatment of obstructive Jaundice cases.

Material and Methods: This prospective, descriptive study was carried out in Hayatabad Medical Complex Peshawar through one and a half years period from January 2009 to June 2010 on 115 patients after taking permission from local ethical and research committee. All patients with a clinical diagnosis of obstructive jaundice were, after informed consent for the study, consecutively enrolled into the study and were thoroughly investigated and their cause established. After appropriate preparations surgery was carried out; the procedure depending upon the nature of the lesion. Intra and post-operative complications, and the outcome of the patient were noted and the whole data analysed.

Results: This study comprises of 115 cases of obstructive Jaundice.The mean age was 41.59 years±11.38SD with range of 19-70 years. Forty eight (41.7%)were males and 67 (58.3%) females. All patients had jaundice, while abdominal pain, weight loss, nausea and vomiting, pruritus, fever with chills and abdominal mass were other presenting complaints (Table 1). Amongst these,62 (53.9%) patients had jaundice due to common bile duct stones, 44 (38.2%) had malignancy of the biliary tract, biliary strictures in 6 (5.2%) cases, pseudopancreatic cyst in 2 (1.73%) cases and worms in common bile duct in one (0.86%) case respectively (Table 2). In the biliary malignant group,29 (25.2%) patients had carcinoma head of the pancreas, 4(3.5%) had cholangio-carcinoma, 6 (5.2%) had carcinoma gall bladder,3(2.6%) patients with malignant nodes at the portahepatis and 2 (1.73%) had secondary metastasis in liver (Table 2). All patients with stones in the CBD were treated by cholecystectomy, ERCP and choledocholithotomy.

Conclusion: Obstructive Jaundice is commonly caused by gall stones, pancreatic and other biliary tumours in our set-up. Early diagnosis of the cause of obstruction is very important especially in malignant cases, as resection is only possible at that stage.

Keywords: Obstructive jaundice, common bile duct (CBD) stones, ERCP.

INTRODUCTION

Obstructive Jaundice is a common surgical problem that occurs when there is an obstruction to the passage of conjugated bilirubin from liver cells to intestine.[1] This obstruction may occur within the liver (hepatic cholestasis) or in the extra-hepatic bile duct system due to mechanical obstruction (obstructive jaundice).[2]

Jaundice due to biliary obstruction may be caused by a heterogeneous group of diseases that include both benign and malignant conditions.[3] The common aetiologies of obstructive jaundice have been reported to vary from one centre to another and from one individual to another.[3,4] Malignancy of the biliary tract and stones in the CBD are common causes of obstruction.[5] Other causes are stricture of CBD, ampullary carcinoma, worm's infestation of CBD and chronic pancreatitis.[6] A CBD stone may cause intermittent jaundice and dilatation of the bile duct due to 'ball valve effect´.[7] Stones in the common bile duct occurs in 10-15% of patients with gall stones.

The symptoms of obstructive jaundice include jaundice with or without pain, dark urine, pruritus, pales tools, weight loss and anorexia.[8] Obstructive jaundice is characterized by the raised levels of serum alkaline phosphatase rather than aspartate transaminase.[9] Obstructive jaundice is not a definitive diagnosis and early investigation to elucidate the precise aetiology is of great importance because pathological changes (e.g. secondary biliary cirrhosis) can occur if obstruction is unrelieved.[7] A vast array of invasive and non-invasive diagnostic tests is available to diagnose and establish the aetiology of surgical obstructive jaundice[7,10]

In investigating obstructive jaundice, ultrasonography is the gold standard examination, shows the size of the bile ducts, may define the level of the obstruction, may identify the cause and gives other information related to the disease (e.g. hepatic metastases, gallstones, hepatic parenchymal change).[7] It may also demonstrate tumours, cysts, or abscesses in the pancreas, liver, and surrounding structures. The Gold standard is Endoscopic Retrograde Cholangio-pancreatography (ERCP).[11,12] ERCP can pick up choledocholithiasis,

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strictures of CBD, any obstruction of the CBD as well as helps in taking the brushing cytology. Computerized tomography, Endoscopic ultrasound, Percutaneous Trans-hepatic Cholangio-pancreatography (PTC) and Magnetic Resonance Cholangiopancreatography (MRCP) can also be used when required.[13]

Obstructive jaundice is a surgical emergency.[7] Jaundice can cause hepatic and renal failure and can also leads to dysfunction of the coagulation cascade.[14] The management of obstructive jaundice poses diagnostic and therapeutic challenges to general surgeons practicing in resource-limited countries.[15] Surgery in jaundiced patients is associated with a higher risk of postoperative complications compared with surgery in non-jaundiced patients. These complications primarily consist of septic complications (cholangitis, abscesses, and leakage), haemorrhage, and impaired wound healing and renal disorders.[16]

Management of obstructive jaundice includes maintaining good hydration, administration of antibiotics, intravenous dextrose solution (10%) as appropriate and vitamin K injections. The surgical approach should be according to the cause and pre-operative findings[5]. There is a great discrepancy between the common and rare causes of obstructive jaundice at various centres and it is mandatory to determine pre-operatively the existence and the nature of obstruction because an ill-chosen procedure can lead to high morbidity and mortality[17,18]. This study was conducted to evaluate the various causes, clinical presentation, therapeutic options and outcome of the treatment of obstructive jaundice.

MATERIAL AND METHODS

This study was carried out on patients suffering from obstructive jaundice were admitted to the Surgical ward of Hayatabad Medical Complex, Peshawar from January 2009 to June 2010, and included 115 patients. All patients of various age groups, sex and profession who had symptoms of obstructive Jaundice confirmed with raised serum alkaline phosphatase was included in the study. All patients with medical jaundice and cirrhosis of liver were excluded.

Diagnosis of obstructive jaundice was based on the history, clinical examination and investigations. A thorough clinical history including age, sex and relevant features like presence of clay coloured stools, anorexia, weight loss, pruritus were taken and correlated with the examination findings of presence of jaundice, scratch marks, abdominal mass and hepatomegaly. A working diagnosis was then made and further workup was planned which included the Full blood count, liver Function tests, blood urea, serum creatinine, electrolytes and prothrombin time (PT). Abdominal ultrasound was done to look for the abnormality of intra and extra hepatic biliary channels, the common bile duct and presence of any gall stones or any abdominal mass. Magnetic resonance Cholangio-pancreatography (MRCP) and CT scan of abdomen were done whenever indicated. ERCP was carried out whenever possible to look for the cause of obstructive jaundice. The final diagnosis was then made on the basis of results of these advanced investigations and histopathology; the results were then compiled.

Pre-operative preparations included maintaining good hydration and administration of antibiotics, intravenous dextrose (10%) solution and vitamin K injections. In anaemic patient's blood transfusion was also carried out. The nature of surgical procedure carried out depended upon the cause and the findings at the time of surgery. Patients were followed up for a period of 6 months for post-operative complications, and the outcome of the patient were noted and the whole data analysed.

RESULTS

During the period under study, a total of 115 patients of obstructive jaundice were enrolled. Of these, 48 (41.7%) were males and females were 67 (58.3%) with a male to female ratio of 1:1.4. Their ages ranged from 19 to 70 years with a mean of 41.59 ± 11.38 years. Malignant obstructive jaundice was seen in 44 (38.2%) patients while 71 (61.8%) had benign aetiology.

Regarding the symptoms, all patients had jaundice, 31(26.9%) patients with benign disease while 36 (31.3%) with malignancy gave history of clay coloured stools. Fifteen patients (13%) presented with cholangitis and 44 (38.2%) patients had pruritus (Table 1). All the symptoms being evaluated were present in 21 (18.3%) patients. Out of which 7(6.1%) patients had benign disease while 14 (12.2%) had malignancy.

The examination findings revealed that 34 (29.6%) patients had scratch marks. The abdominal mass was appreciated in 27(23.5%) patients with malignancy and one patient (0.8%) with benign disease (Table 1). Choledocholithiasiswas the commonest amongst the benign causes and was seen in 62 (53.9%) patients (Table 2). Among the 38.2% cases of malignant obstruction, 29 (25.2%) had carcinoma head of pancreas which was the highest (Table 2). Other benign and malignant causes are shown in Table 2.

The abdominal ultrasound was able to pick the dilated intra and extra hepatic channels in about 35.7% and 46% of the cases respectively. Ultrasound showed gallstones in 48.7% (56/62) and CBD stones in 38.2% (44/62) respectively. The CT-Scan abdomen helped in diagnosing Cancer head ofPancreas in 25.2% (29/115)

and cancer gallbladder in 4.3% (5/115) of the malignant cases.ERCP was able to demonstrate the choledocholithiasis in 53.9% (62/115) of the benign cases. ERCP also showed some diagnostic yield in picking up cancer-gall bladder (2/6) and cholangiocarcinoma (2/3).

The ALT value was found to be elevated in 40% (46/115) of the cases. The PT and INR were deranged in 86 (74.8%), more in the malignant group patients. Serum bilirubin and alkaline phosphatase were raised in 100% and 83.5% respectively.

All patients with CBD stones had preoperative ERCP and sphincterotomy, and was successful in 85.5% cases (53/62) followed by cholecystectomy. Those who had failed ERCP had T-tube placement in CBD during cholecystectomy.Out of the 29cases of Carcinoma Head of the Pancreas; four (13.8%) were treated by pancreato -duodenectomy and 25 (86.2) by choledochoduedenostomy (17/58.6%) and cholecysto-jejunostomy (8/27.6%). Among 4 cases of cholangiocarcinoma, one (25%) was treated by hepato-jejunostomy and 3 (75%) underwent palliative stenting. Among six patients with Carcinoma of the Gall bladder, all were found inoperable at laparotomy. Three patients had suspected malignant nodes at the porta-hepatis; they refused surgery and were advised endoprosthesis. In both pseudopancreatic cysts, surgical cystogastrostomy were performed successfully. Obstructive jaundice due to worms was treated successfully with ERCP and sphincterotomy. All six patients with benign biliary strictures had stent placed at ERCP or PTC respectively.

During follow up, four patients with cholecystectomy had wound infections which were treated with wound toilet, antibiotics according to C/S report and daily dressing. Among 9 patients with T-tube in CBD, 2 showed retained stones in the CBD on T-tube cholangiogram. Three patients had post cholecystectomy sub hepatic collection, treated successfully with antibiotics and ultrasound guided aspiration. No mortality was noted in benign group (Table 3).

In malignant group, 4 patients with the carcinoma head of pancreas died, one with pancreaticoduodenectomy on first post-operative day and 3 with bypass procedures during follow up. Two patients with Cholangiocarcinoma and two patients with cancer gall bladder died during follow up. Two patients among cancer head of pancreas with bypass had leak from the anastomotic site. Wound infection occurred in seven patients in malignant group post-operatively. Three patients had cholangitis on follow up, treated with admission and antibiotics. Three patients developed deep vein thrombosis post-operatively (Table 3). Overall five patients, one in benign group and four in malignant group developed renal failure post-operatively respectively.

Table-1: Symptoms and signs for benign and malignant causes of obstructive jaundice

Symptoms/ Signs	benign	Malignant	Total
Abdominal pain	66	26	92
Clay colour stool	31	36	67
Anorexia/ weight loss	11	38	49
Pruritus	18	26	44
Scratch marks	12	22	34
Abdominal mass	1	27	28
Jaundice	71	44	115
Fever with chills	4	11	15

Table-2: Causes of obstructive jaundice

Causes	No of patients	Percentage
Benign causes	**71**	**61.8**
Cholidocholithiasis	62	53.9
Biliary strictures	6	5.2
Pseudopancreatic cyst	2	1.7
Worms in CBD	1	0.86
Malignant causes	**44**	**38.2**
Ca head of Pancreas	29	25.2
Ca Gall bladder	6	5.2
Cholangiocarcinoma	4	3.5
Metastatic malignant nodes in Portahepatis	3	2.6
Liver secondaries	2	1.73

Table-3: Complications of treatment

Complications	Benign	Malignant	Total
Wound infections	4	7	11
Coagulopathy	1	3	4
Renal Failure	1	4	5
Bile leak	3	2	5
Wound dehiscence	1	7	8
Mortality	0	8	8
DVT	0	3	3

DISCUSSION

Obstructive jaundice poses diagnostic and therapeutic challenges to general surgeons and contributes significantly to high morbidity and mortality.[19] The obstructive lesions of the biliary system are difficult problem for the surgeon as most of the patients are old and poor surgical risks.

The M:F ratio in our study was 1:1.4, comparable to a M:F ratio of 1:1.3 in a study by Chalya PL, et al.[20] The mean age of patients in our study was 41.59 years, which is comparable to mean age of 41.12 years in a study by Saddique M.[5]

The aetiology of obstructive jaundice was benign in 71 (61.8%) cases, whereas 44(38.2%) patients had malignant cause. Choledocholithiasis was the commonest

cause among the benign group in 62 (53.9%) patients, whereas the commonest tumour among the malignant group was carcinoma head of pancreas in 29 (25.2%) patients (Table 2). Khurram et al,[12] Iqbal J et al[22] and Assi AN et al[23] also noted CBD stones as the commonest cause of obstructive jaundice in their studies. In our study most of the CBD stones were found amongst the females, as also shown in other studies.[21,23] The increased incidence of obstructive jaundice amongst the females is due to the fact that gall stones are frequently found in them.[22,24]

Tumours causing biliary channel obstruction are generally ampullary carcinomas, gall bladder carcinomas extending into the CBD, metastatic tumours (usually from the gastrointestinal tract or the breast), secondary lymphadenopathies at the portahepatis and cholangiocarcinomas.[25] In our study carcinoma head of pancreas was the commonest amongst the malignancies (25.2%) followed by the carcinoma gall bladder (5.2%), cholangiocarcinoma (3.5%), malignant nodes at the portahepatis (2.6%) and (1.73%) had secondary metastasis in liver. In their studies[5,17,20] carcinoma head of pancreas was also the commonest cause of malignant biliary obstruction, as also shown in our study.About 12.5%, 12.5% and 8.3% patients had cancer gallbladder, Cholangiocarcinoma and malignant nodes metastasis at portahepatis respectively in a study by Saddique M, as compared to 5.2%, 3.5% and 2.6% in our study respectively.

Regarding other causes of benign obstructive jaundice in our study, biliary strictures accounts for 6 (5.2%) cases, pseudopancreatic cyst in 2 (1.73%) cases and worms in common bile duct in one (0.86%) case respectively.

Thirty one (26.9%) patients with benign disease while 36 (31.3%) with malignancy gave history of clay coloured stools. Fifteen patients (13%) presented with cholangitis and 44 (38.2%) patients had pruritus (Table 1). All the symptoms being evaluated were present in 21 (18.3%) patients. Out of which 7(6.1%) patients had benign disease while 14 (12.2%) had malignancy. Pruritus was seen more in the malignant cases. Anorexia and weight loss were more frequently seen amongst the patients of malignant jaundice. The pain in the abdomen (the right hypochondrium) was more frequently seen amongst the benign causes (92.9%) and was almost always present in every case of choledocholithiasis. While almost 30% of the patients with malignancy also had abdominal pain on presentation possibly due to advanced disease.[10] About 22.5% patients with malignant jaundice in our study had pain abdomen, as compared to 16.2% in a study by Siddique K et al.[17] The abdominal mass was appreciated in 27/44 (61.4%) of the patients with malignancy due to the local spread of tissues and in one cases of choledocholithiasis due to stones in the cystic duct and CBD simultaneously leading to gallbladder distension (mucocele) and obstructive jaundice, but not palpable in any other benign condition. In a study by Siddique K et al,[17] 18/34 (52.9%) had palpable gall bladder in malignant obstructive jaundice cases, as compared to 61.4% in our study.

All patients with CBD stones had preoperative ERCP and sphincterotomy, and was successful in 85.5% cases (53/62) followed by cholecystectomy. Those who had failed ERCP had T-tube placement in CBD during cholecystectomy. Out of the 29 cases of carcinoma head of the pancreas; four were treated by pancreatoduodenectomy and the remaining by bypass procedures. Among 4 cases of cholangiocarcinoma, one was treated by hepatojejunostomy and 3 underwent palliative stenting. All patients with Carcinoma of the Gall bladder,were found inoperable at laparotomy. Two patients with malignant nodes at the portahepatis; refused surgery and were advised endoprosthesis. High incidence of palliative surgery in patients with malignant obstructive jaundice is due to delayed presentation for treatment as a result the majority of patients with malignant conditions report to hospital very late when the disease is in advanced stage, and the only option is palliative surgery.

In both pseudopancreatic cysts, surgical cystogastrostomy were performed successfully. Obstructive jaundice due to worms was treated successfully with ERCP and sphincterotomy. All six patients with benign biliary strictures had stent placed at ERCP or PTC respectively.

During follow up, a total of 11 (10.6%) patients developed wound infections, 4 (3.9%) in benign group and 7 (6.7%) in malignant group respectively with the overall wound infection rate of 10.7%, as compared to 18.2% in a study by Chalya PL.[20] In our study 3.4% and 4.3% patients had coagulopathies and renal failure post-operatively, more in malignant group, as compared to 2.5% and 1.75% in his study by Chalya PL[20] respectively. The overall mortality was 6.9%, as compared to 15.5% and 8% in their studies by Chalya PL[20] and Parks RW[26] respectively. Others complications are shown in Table 3.

In our study, the majority of patients with malignant obstructive jaundice underwent palliative surgery mainly by bypass surgery, whereas the majority of patients with benign obstructive jaundice underwent curative surgery. Similar treatment pattern was also reported by Mohammed etal[1]and Chalya PL.[20]

CONCLUSION

Obstructive jaundice in our setting is more prevalent in females. Choledocholithiasisis the commonest benign cause, while cancer head of pancreas is the commonest malignancy in our setup. Early diagnosis of the cause of obstruction is very important especially in malignant cases, as resection is only possible at that stage.

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Workshop on clinical audit held at Rawalpindi Medical College

A workshop on clinical audit was recently arranged under the patronage of Prof. Muhammad Umar Prof of Medicine, Principal Rawalpindi Medical College and Chief of Allied Hospitals at the new teaching block, Holy Family Hospital, Rawalpindi with an aim to improve provision of medical services to public. Dr. Mamoon Yusuf, Fellow in Clinical Education & Simulation Specialty Registrar Anesthesia & Intensive Care Medicine, Hull Royal Infirmary, UK and the guest speaker., Prof. Hamama-tul-Bushra Khar and Professor Rai Muhammad Asghar, Head of Pediatrics Department & Director of Medical Education at RMC, facilitated the workshop. More than 30 doctors from different specialties benefited from this workshop organized for the first time in the country.

The clinical audit is a newer approach towards developing an evaluation system to ensure whether the health professionals are doing a reasonably good job or not. While addressing the participants of the workshop, the guest speaker highlighted the importance of clinical audit in provision of effective, efficient and safe medical services to public explaining with examples why the evaluation is indispensable at every tier of healthcare provision. The participants of the workshop were informed of the concept of Appraisal and Revalidation. They explained that every physician is required to go through a process to ensure that he is fit to retain his professional credibility. The process involves the authorities providing appraisals for the employed doctors and regular feedback from the patients.

Prof. Hamama-tul-Bushra Khar spoke in detail on what quality meant with respect to different tiers namely individual, hospital, regional, national, and international level. Professor Rai Muhammad Asghar explained how the clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria". When clinical audit is conducted well, it enables the quality of care to be reviewed objectively, within an approach which is supportive, developmental and focused on improvement, said Professor Umar. He added that everyone who is involved in the provision of healthcare should be involved in clinical audit. He explained different ways of auditing, patient satisfaction, peer review, error reports, prescription perusal, etc and recommended that a complete audit cycle if regularly conducted goes a long way in improving effective service provision.

اٹھا نہ شیشہ گرانِ فرنگ کے احساں
سفالِ ہند سے مینا و جام پیدا کر
اقبال

OBITUARY

Prof. Dr. Faiz Muhammad Halepota

Department of Ophthalmology, PMC Hospital, Nawabshah, Sindh

It is indeed a very sad occasion that the ophthalmic community has lost a legend, a senior Ophthalmologist of the country Prof. Faiz Muhammad Halepota, who passed away peacefully during Eid days in Hyderabad

اِنَّا لِلّٰہِ وَاِنَّا اِلَیْہِ رَاجِعُوْنَ

Dr. Amer Yaqub, General Secretary, the President and the members of OSP Federal Branch, Islamabad have expressed their profound grief over the sad demise of Prof. Halepota. They offer sincere condolences on the sudden death of such a great person. He was a very cool minded eye surgeon with qualities of head and heart. He was teacher of teachers. May Allah bless his soul in Peace and grant him the highest place in ***Jannah.***

Prof. Faiz Muhammad Halepota was a great man who never stopped the learning process and silently contributed a lot to the ophthalmic community in Pakistan. He was one of the pioneers of Oculoplastics & Lacrimal Surgery in Pakistan and wrote many original and research papers in the journal and received Gold Medal for his best adjudged paper in OSP Conference at Hyderabad.

I still remember, when the Federal Branch of OSP was inaugurated in Islamabad, he was the first man to arrive and get registered. I always found him very loving, straight forward, cool and serene faced perfect gentlemen who never lost his temper even at odd moments.

Prof. Dr. Syed Imtiaz Naqvi from Larkana had decades long association with him and he found him working with heart and soul for the patients and the profession. In commemoration of his devoted services and a mark of respect, he has created a chair in the name of Prof. Halepota and renamed the Lacrimal Unit after his name at Chandka Medical College, Larkana. May Almighty Allah bestow His Rahmat upon Prof Faiz Muhammad Halepota and bestow sabr upon his wife and children. Amin!

We produce his favorite couplet of Iqbal, which he used to recite

عشق قاتل سے بھی، مقتول سے ہمدردی بھی
یہ بتا کس سے محبت کی جزا مانگے گا؟
سجدہ خالق کو بھی، ابلیس سے یارانہ بھی
حشر میں کس سے عقیدت کا صلہ مانگے گا؟
اقبال

Sogwaran:
Prof. M. Yasin Khan Durrani Chief Editor
& the entire management of Ophthalmology Update, Islamabad.