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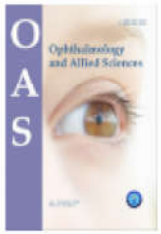

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Intra Operative and Post Operative Complications in SICS Patients with Poorly Dilating Pupil

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Abstract

Purpose: To evaluate intraoperative and post operative complications in Small incision cataract surgery in patients with poorly dilating pupil.

Methods: An interventional study done between November 2016 to April 2017 which included patients with poorly dilating pupil (<6mm) after pharmacological dilatation, who underwent SICS under local anaesthesia by same surgeon. Intraoperative and post operative complications were studied. Patients were reviewed upto 6weeks postoperatively.

Results: Total of 60 eyes with poorly dilating pupil underwent cataract surgery. Intra operative complications encountered were zonulardialysis (2 eyes), posterior capsular tear (1 eye), iris trauma (2 eyes). Post operative complications were corneal odema (12 eyes), anterior chamber reaction (6 eyes), irregular pupil (6 eyes), 80% patients had BCVA >6/18.

Conclusion: Surgeons should be aware of the potential complications during cataract surgery in poorly dilating eyes. Caution should be taken at each stage to prevent complication.

Keywords: Intraoperative Complications; Post Operative Complications; Poorly Dilating Pupil.

Introduction

A small pupil is a relatively common problem experienced during cataract surgery. It has been shown that about 1.6% of cases will fall into this category. The small pupil can impede visualization and make instrumentation into the eye more difficult. Eyes complicated by Pseudoexfoliation [1] with small pupil likely to cause lot of intraoperative and postoperative complications.

Many patients who present for cataract surgery have eyes complicated by pupils with iris sphincter sclerosis due to aging, synechiae, previous trauma or surgery, diabetes, iridoschisis, uveitis, chronic miotic therapy, pseudoexfoliation, or other issues may cause a pupil to dilate poorly. The small pupil (less than 3.0mm or middilated pupil < 6mm) can impede visualization and make instrumentation into the eye more difficult. A well-dilated pupil with a sharp red reflex enhances the ease of cataract extraction and decreases the likelihood of complications like iris sphincter tear, bleeding, ruptured posterior capsule and loss of the nucleus. Lens insertion can be more difficult and visualization of the haptics and the IOL position difficult to evaluate. The postoperative result of these encounters can be an irregular and atonic pupil, photophobia and discomfort for the patient decreased VA. This study is done to evaluate the intraoperative and postoperative complications with small incision cataract surgery in patients with poorly dilating pupil.

Material and Methods

This was an interventional study conducted in department of ophthalmology, NMCHRC, Raichur .

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The study was done for a period of 6months between Nov 2016 to April 2017. A total of 60 patients admitted for cataract surgery with poorly dilating pupil (<6mm) after pharmacological dilation with tropicamide and phenyephrine 0.5% eye drops of age above 50years of either sex were included in the study.

Exclusion criteria werepatients with a history of chronic miotic use, traumatic cataract, complicated cataract, lens induced glaucoma, high myopia and previous ocular surgery and insufficient followup cases.

Institutional ethics committee clearance was obtained before the start of the study.

All patients underwent detailed preoperative ocular examination including clinical history and systemic examination, measurement of uncorrected and best corrected visual acuity , intraocular pressure (IOP) by Goldmannapplanation tonometry. A-scan biometry was also used to measure the power of the cornea (keratometry) and axial length of the eye, and using this data to determine the ideal intraocular lens power. Detailed slit lamp biomicroscopy under maximal mydriasis was performed to assess cause of poorly dilating pupil (<6mm) like pseudoexfoliative material on the anterior capsule of lens, pupillary border,posterior synechia, type and grade of cataract, and the presence of phacodonesis or zonulolysis. Cataract was graded using "lens opacity classification system" Gonioscopy was done and the angle was graded by Shaffer's system of grading. A detailed fundus examination was conducted with slitlamp biomicroscopyusing+90D and indirect ophthalmoscopy using +20D lens. All observations and demographic data were carefully recorded using a protocol sheet.

Prophylactic antibiotics drops moxifloxacin 0.5% eye drops started one day before surgery. Patients were dilated with tropicamideand phenylephrine 0.5% eyedrop and non-steroidal anti-inflammatory drops flurbiprofen sodium 0.03% was used 3 times every 15 minutes to maintain the dilatation

Surgical Technique

All patients underwent small incision cataract surgery by experienced surgeon.

After peri-bulbar block with 5 ml of with2% lignocaine with adrenaline (1: 20, 0000)with 150 units/ml of hyaluronidase. Povidine-iodine 5% was instilled into the conjunctival sac. For SICS a fornix base conjunctival flap was made, scleral incision was made with bard parker knife with 15 no. blade temporally or supero-temporally and sclerocorneal tunnel was constructed with crescent. Continuous curvilinear capsulorhexis (CCC) aimed at 5mm to 5.5 mm was done using the needle cystitome. Small pupils were managed with multiple sphincterotomies, viscomydriasis, intracameral adrenaline. A thorough hydrodissection was performed to separate cortex from nucleus. Nucleus was delivered by visco expression. Irrigation and aspiration was done with Simcoe's two way irrigation and aspiration cannula. Rigid, single piece, biconvex, polymethyl meth acrylate posterior chamber intraocular lens (IOLs) with optic diameter of 5.25 mm was implanted in bag.

Intraoperative and Post Operative Complications were Noted

Post-operatively, patients were put on topical antibioticsand steroids tapered over 4-6 weeks depending upon the post operative inflammation. Patients were followed on the post-operative day 1, day 7 and day 14 and at weekly intervals for 6weeks to evaluate intraocular pressure spikes, presence of intraocular inflammation, decentration/tilt of intra ocular lens and corneal odema. Postoperative uncorrected visual acuity was recorded every week and best corrected visual acuity was recorded at 6th week.

Results

A total of 60 eyes of 60 patients with poorly dilating pupil underwent small incision cataract surgery by experienced surgeon after pharmacologically dilating with tropicamide and phenylephrine 0.5% eye drop.

Of 60 patients, 35 (58.33) were females and 25 (41.66%) were males. The ages of 60 patients in this study was between 50 and 70 years. Out of these 22 (36.66%)were in 50-60year age group and 38 (63.33) were in 60-70year age group. Out of 60 patients 6 (10%) had pupillary diameter of < 4mm, 20 (33.33%) had pupillary diameter between 4-5mm, 34 (56.66%) had pupillary diameter between 5-6mm after pharmacologically dilating with tropicamide and phenylephrine 0.5% eye drops. 16 (26.66%) eyes had nuclear sclerosis, 10(16.66%) had cortical cataract and both nuclear sclerosis and cortical cataract was present in 34 (56.66%) eyes. Mean intraocular pressure (IOP) was 18.23±2.10 mmHg.

Pre-operative features showed that a high percentage of eyeshad a rigid pupil. None of the

pupils dilated beyond 6mm. Almost all eyes showed some evidence of pigment dispersion mainly on the anterior surface of the lens and cornea. None of the eyes showed frank subluxation of lens

All patients underwent cataract surgery using SICS technique. Surgical complications are listed in [Table 1]. 6 (10%) cases required sphincterotomy to facilitate capsularhexis andnucleus delivery. Zonular dialysis seen in 2 (3.33%)cases, posterior capsular tear with vitreous loss seen in 1 (1.66%) due to difficulty in surgical maneuvers,iris trauma occurred in 2 cases (3.33%).

Patients were followed on thepost-operative day 1, day 7, day 14 and at weekly intervals for 6weeks to evaluate intraocular pressure spikes, intraocularin flammation, decentration/tilt of intraocular lens and corneal odema.

Post-operative hazy cornea (corneal odema) was seen in 12 (20%) cases. Anterior chamber reaction in 6 (10%)cases, irregular pupil seen in 6 (10%) cases [Table 2].

The IOP was measured both pre-operatively and postoperatively. We did not find any pressure spikes in any patient. Final visual acuity was recorded after 6 weeks of surgery [Table 3]. At the end of 6 weeks, 3 (5%) patients showed persistent corneal edema probably due to corneal decompensation. However, pre- or post-operative specular microscopy and pachymetry were not included in this study.

48 (80%) cases had visual acuity between 6/6 – 6/18, 9 (15%) cases had visual acuity between 6/18-6/60, 3 (5%) cases had visual acuity less than 6/60.

Table 1: Intraoperative complications

Intraoperative complications	Number of cases	PD <4mm	P	PD 4-5mm	P	PD 5-6mm	P	TP
Zonular dialysis	2	2	3.33%	0	0	0	0	3.33%
Posterior capsular tear with vitreous loss	1	1	1.66%	0	0	0	0	1.66%
Iris trauma	2	1	1.66%	1	1.66%	0	0	3.33%

PD: pupillay diameter. P: percentage. TP: total percentage

Table 2: Post-operative complications

Post operative complication	Number of cases	PD <4mm	P	PD 4-5mm	P	PD 5-6mm	P	TP
Corneal odema	12	6	10%	4	6.66%	2	3.33%	20%
Anterior chamber reaction	6	3	5%	2	3.33%	1	1.66%	10%
Irregular pupil	6	6	10%	0	0	0	0	10%

Table 3: Final visual acuity

Visual acuity	Number of cases	PD <4mm	P	PD 4-5mm	P	PD 5-6mm	P	TP
6/6-6/18	48	3	5%	10	16.6%	35	58.33%	80%
6/18-6/60	09	5	8.33%	3	5%	1	1.66%	15%
<6/60	03	3	5%	0	0	0	0	5%

PD: pupillay diameter. P:percentage. TP: total percentage.

Discussion

Poorly dilated pupil is one of the most common problems faced by cataract surgeons and is associated with a higher incidence of Intraoperative complications such as capsular rupture and vitreous loss .

There are many causes of poor pupil dilatation e.g. diabetes mellitus, senile miosis, intraoperative floppy iris syndrome, pseudoexfoliation syndrome, uveitis with posterior synechiae and some conditions after ocular surgery.

Certain eyes are at a higher risk of complication during cataract surgery. Operations on such 'high-risk' eyes are also more likely to yield a poor visual outcome (defined as best corrected vision less than 6/60 after surgery) [2].

Learning to recognise when eyes are at greater risk, and acting accordingly, will help you to avoid

complications. Even so, before the operation takes place, it is good practice to explainto such patients that a poor outcome is a possibility. This makes these patients' expectations more realistic and improves postoperative compliance and follow-up.

A prospective study of risk factors in cataract surgery, carried out on one thousand extracapsular cataract extractions, showed decreased pupil size to be the only significant risk factor for vitreous loss. Zonular breaks were also more common with decreasing pupil size [3].

A high rate of capsular rupture has also been reported in diabetic eyes undergoing cataract extraction [4,5].

Some of the major cause of poorly dilating pupil in our study include pseudoexfoliation, rigid pupil, senile miotic pupil, pupil in diabetic patients.

PXE is a relatively common finding in elderly patientsundergoing cataract surgery, but pre-operative detection may be missed if the eyes are not seen under slit lamp. Direct signs of zonule instability such as lens subluxation, zonular dialysis, iridodonosis or phacodonosis should be carefully looked for pre-operatively. Often the earliest sign is a subtle iridodonesis. It is best assessed prior to the pupillary dilatation while lens related changes are best seen after dilatation [6]. One study reported that an axial anterior chamber depth of less than 2.5 mm increased risk of surgical complications five fold [7]. The amount of exfoliative material in the zonules does not seem to be predictive of intra operative zonule weakness [8].

In our study Out of 60 patients 6 (10%) had pupillary diameter of <4mm, 20 (33.33%) had pupillar diameter between 4-5mm, 34 (56.66%) had papillary diameter between 5-6mm.

In the present study, most frequent problem encounteredwas a rigid pupil and none of the pupils dilated more than 6mm in spite of use of standard mydriatic drops. We resorted to sphincterotomy, viscomydriasis, intracameral adrenaline but other alternatives include bimanual stretching and use of iris hooks or flexible iris retractors are also possible. Sphinterotomy and stretching have the disadvantage of causing post-operative distorted pupil, which may even lead to the pupillary capture.

Intra operative complications encountered were Zonular dialysis in 2 (3.33%) cases, posterior capsular tear with vitreous loss in 1 (1.66%) cases due to difficulty in surgical maneuvers, iris trauma occurred in 2 (3.33%) cases. Post-operative hazy cornea (corneal odema) was seen in 12 (20%) cases. Anterior chamber reaction in 6 (10%) cases, irregular pupil seen in 6 (10%) cases. After 6 weeks 48 (80%) cases had visual acuity between 6/6 – 6/18, 9 (15%) cases had visual acuity between 6/18-6/60, 3 (5%) cases had visual acuity less than 6/60. We did not encounter complications like decentered IOL, retained cortical matter, postop hyphema as seen in other studies.

Similar results were obtained in a study conducted by Pranathi, et al cataract surgery in pseudoex foliation [9] were out of 52 cases operated zonular dialysis was seen in 2 (3.8) cases, Posterior capsule rupture was seen in 4 (7.7%) cases, Post-operative hazy cornea was seen in 12 (23%) cases.

In a study conducted by BC. Hemalatha, SathyendranathB Shetty [10] on 50 eyes with pseudoexfoliation who underwent cataract surgery Intraoperative complications encountered during surgery were; zonular dialysis in 3 cases, posterior capsular tear in 2 cases, out of these 5 cases vitreous loss was seen in 3 cases. Postoperative complications were corneal odema in 17 cases, of which endothelium de-compensated in one case, while early posterior capsular opacification was seen in 6 cases. Final best corrected visual acuity was between 6/6-6/12 in 39(78%) eyes, 6/18 -6/36 in 6(12%) cases; 6/60 to less in 5(10%) cases.

In another study conducted by Islam, et al on 512 eyes with pseudoexfoliation and cataract surgery complications [11] encountered were iridodialysis in 6 (1.17%), zonular dialysis in 7 (1.36%) posterior capsule rupture with vitreous loss in 14 (2.73%), retained cortical matter in 44 (8.59%), and decentered intraocular lens 23 (4.49%) cases,post operative hyphema in 6 cases (1.17%), there was significant intraocular inflammation in 61 (11.91%) cases and corneal decompensation in 23 (4.49%) cases.

Posterior chamber intraocular lens (PC-IOL) implantation is a common technique for managing senile and diabetic cataract. The incidence of complications following extracapsular cataract surgery is still higher in diabetic patients than in nondiabetics. More pigment dispersion, fibrin reaction, posterior synechiae and transient iridal vascular congestion was found by Krupsky et al. (1991) [12]. More postoperative inflammation in diabetic patients has also been reported (Cunliffe et al. 1991) [13].

A small resting pupil is often found in diabetic patients (Smith & Smith 1983) [14]. Also, the mydriatic response is weaker in diabetic patients as compared to controls after topical application of an anticholinergic drug (Huber et al. 1985) [15]. However, a combination of anticholinergic and

adrenergic drugs provides good mydriasis in diabetic cases (Huber et al. 1985). Progressive miosis induced by surgical trauma occurs frequently during extracapsular (Psilas et al. 1992)

Conclusion

Although cataract with poorly dilating pupil is a challenging scenario to operate upon, a proper pre-operative assessment and case based management plan is required as the magnitude of problems may vary from patient to patient. It is possible to achieve good results in most patients by taking adequate preoperative precautions and readiness to handle intraoperative complications.

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Dry Eye Syndrome in Type II Diabetic Patients Attending A Medical College Teaching Hospital

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Abstract

Introduction: Diabetes mellitus is one of the leading health problem all over the world. Dry eye syndrome (DES) is common in diabetes mellitus. The study was done to detect theprevalence of DES in type II diabetic patients and to determine the association of dry eyes with diabetic retinopathy.

Methodology: Diabetic patients(n=200) attending Ophthalmology OPD at Khaja Bande Nawaz Institute of Medical Sciences (KBNIMS), Kalaburagi during the period fromApril to December 2017 were included in the study group, basedon the inclusion & exclusion criteria.

Results: Our study showed that the prevalence of DES in diabetes was 51%, with higher rate in females and older age group. 33% of diabetic retinopathy patients had DES even though it was not statistically significant.

Conclusion: Since there exists an association between diabetes and DES, all diabetic patients should be screened for DES to prevent ocular surface damage.

Keywords: Diabetes Mellitus; Diabetic Retinopathy; Dry Eye Syndrome (DES).

Introduction

Diabetes mellitus is one of the leading health problem all over the world [1]. India with the highest number of diabetic population has been identified by WHO as "the diabetic capital of the world". WHO estimates that the diabetic population in the world would rise to 370 million by 2030, which is double the figure reported in 2000 [2]. Diabetes mellitus is characterized bychronic hyperglycaemia that leads to microvascular complications like peripheral neuropathy, nephropathy, and retinopathy. Ocularcomplications of diabetes mellitus include cataract, glaucoma, retinopathy, punctuate keratitis, and recurrent corneal lesions [3]. Dry eye syndrome (DES/ keratoconjunctivitis sicca) is common in diabetes mellitus. The prevalence of DES has been found to be around 54% [4]. DES isa multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear-film instability with potential damage to the ocular surface [5]. Symptoms of DES range from mild transient irritation to persistent dryness, burning, itchiness, redness, pain, ocular fatigue and visual disturbance [6]. DES results in corneal and conjunctival epithelial alterations such as punctate keratopathy, recurrent erosions, persistent epithelial defects and neurotrophic keratopathy. Delayed wound healing withhigher risk of microbial keratitis and potential visual impairment due to corneal scarring may also be encountered in DES [7]. Diabetic Retinopathy (DR) is a progressive condition with microvascular alterations that lead to retinal ischemia, retinal permeability, retinal neo vascularization and macular oedema. All individuals with DM will be at risk of developing diabetic retinopathy. It is extremely important to classify and stage the severity of diabetic retinopathy in order to establish adequate therapy. If left untreated, patients with diabetic retinopathy can

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suffer severe visual loss. Early Treatment Diabetic Retinopathy Study (ETDRS) is the gold standard for the classification of diabetic retinopathy. With proper management more than 90% of cases of visual loss can be prevented. Chronic uncontrolled DM can lead to both dry eye syndrome and diabetic retinopathy [8]. Thus, to improve the quality of life and to prevent the complications it becomes imperative for the early diagnosis of DES and retinopathy in patients with diabetes mellitus.

Aims and Objectives

i. To study the prevalence of dry eye syndrome in Type 2 diabetes mellitus patients, among those attending the Ophthalmology OPD.
ii. To determine the association of dry eyes with diabetic retinopathy.

Materials and Methods

Type2 diabetic patients (n=200), attending Ophthalmology OPD at KBNIMS, Kalaburagi were included in the study group, during the period of April -December 2017.

Inclusion Criteria

Patientswith type 2 diabetes mellitus of all age groups and of both sexes.

Exclusion Criteria

1. Patients with previous ocular surgeries.
2. Patients using contact lens.
3. Patients with systemic and ocular diseases which can cause dry eye.
4. Patients using systemic and topical medications which can cause dry eye.

Methodology

The patient's history of diabetes with respect to the duration, thetreatment of diabetes and diabetic control was recorded. A detailed history regarding ocular symptoms of dry eye like irritation, tearing, burning, foreign body sensation, photophobia, blurry vision and redness was also elicited. Detailed ocular examination including visual acuity, slit lamp examination, intraocular pressure and dilated fundus examination of all the patients was done.

Tests for Dry Eye

• *Tear Meniscus Test*

Slit lamp examination of the inferior tear meniscus, which is normally 1.0mm in height and convex. A tear meniscus that is 0.3mm or less is considered abnormal.

• *Tear Break up Time(TBUT)*

A fluorescein strip moistened with sterile saline is applied to the tarsal conjunctiva. After several blinks, the tear film is evaluated using a broad beam of the slitlamp with a blue filter. The time lapse between the last blink and the appearance of the first randomlydistributed dry spot on the cornea is the tear break up time.Break-up time less than 10 seconds is considered abnormal.

• *Schirmer'Stest*

Basic secretion test is performed after instillation of a topical anaesthetic.It is performed by placing a narrow filter-paper strip (Whatmann Filter paper No: 41) in the lower fornix at the junction of middle and lateral thirds with 5 mm of the paper folded within the inferior cul-de-sac. Aqueous tear production is measured by the length in millimetres that the strip wets during the test period of 5 minutes.Less than 10mm of wetting after 5 minutes is diagnostic of dry eye.

- Dry eye was defined as withthose having one or more symptoms present for most of the time, along with one or more positive clinical tests i.e. tear break up time of ≤ 10 seconds, Schirmer's test score ≤ 10mm.
- Dilated fundus examination with direct ophthalmoscopy, indirect ophthalmoscopy and slit lamp bio microscopy using 90 D lens was done to note for diabetic retinopathy. Grading of diabetic retinopathy was done as per the Early Treatment Diabetic Retinopathy (ETDRS) classification.

Statistical Analysis

Statistical data was analysed by using SPSS 20.0 version. Chi-square test was applied for significance. P value < 0.05 considered as statistically significant.

Results

In the present study, out of 200 type II diabetic patients, 102 patients were diagnosed to have dry

eye. Table 1 shows the sex wise distribution of type II diabetic patients with dry eyes.The study reveals that, there were 108 (54.0%) females, 92 (46.0%) males in the study. Males with dry eye cases were 42 (45.6%) and females with dry eye cases were 60 (58.8%). However there was no statistical significance oftype II diabetes with dry eyes with male and female patients.

Table II depicts the association of age with dry eyes. In the study, maximum numberof type II diabetes cases {72 (36.0%)} were in the age group of 51-60 years. The age group of 51-60 years also contains the maximum number of dry eyescases i.e.48 (66.7%). In the age group of 61-70 years, there were 61 diabetes cases (30.5%) and 36 (59%) dry eyes cases were reported. In the age group of less than 40 years there were only 2 diabetes cases (1.0%) and no dry eyes cases were reported. In the age group of>70 years there were 30 (15%) diabetic patients among whom 16patients (53.3%) had dry eyes. In the age group of 41-50 years there were 35 diabetes cases (17.5%) and 2 (5.7%) of dry eyes cases. The association of age with dry eyes was statistically very highly significant (P<0.001).

Table 3 shows the clinical test results of dry eyes. TBUT clinical test detected 79 cases (39.5%) of dry eyes and Schirmer's test detected 64 cases (32.0%) of dry eyes.There was no statistical significant difference of detectionof dry eyes with clinical tests (P>0.05).

Table 4 depicts the association of DM with retinopathy. Study reveals that 66 (33.0%) diabetic patients had retinopathy while 134 (67.0%) patients had no diabetic retinopathy. Among the retinopathy cases maximum number of cases 38 (57.6%) were with mild NPDR, 19 (28.8%) cases were with moderate NPDR and 9 (13.6%) cases were in severe NPDR and PDR.

Table 5 shows the correlation between dry eye syndrome and diabetic retinopathy in diabetic patients. 68 patients had dry eye syndrome with no diabetic retinopathy and 34 patients had dry eyes in diabetic retinopathy group. However there was no statistical significant association between dry eyes and retinopathy (P>0.05).

Table 1: Sex wise distribution of Type II Diabetic Patients with Dry Eyes

Sex	No of Type II DM		With Dry Eye		P value
	Patients	Percentage	Patients	Percentage	
Male	092	46.0	42	45.6	X^2=1.92
Female	108	54.0	60	58.8	P>0.05
Total	200	100.0	102	51.0	Not Significant

Table 2: Association of Age with Dry Eyes

Age (Years)	Type II DM Patients		With Dry Eyes		P value
	No. of cases	Percentage	No. of cases	Percentage	
< 40	2	1.0	0	0.0	
41-50	35	17.5	2	5.7	X^2=40.12
51-60	72	36.0	48	66.7	P<0.001
61-70	61	30.5	36	59.0	
>70	30	15.0	16	53.3	Very Highly Significant
Total	200	100.0	102	51.0	

Table 3: Clinical Test Results of Dry Eyes

Test	Positive		Negative		Total		P value
	Patients	Percentage	Patients	%	Patients	%	
TBUT	79	39.5	121	60.5	200	100.0	X^2=2.44
Schirmer's test	64	32.0	136	68.0	200	100.0	P>0.05
							Not Significant

Table 4: Association of DM with Retinopathy

Retinopathy	No. of Cases	Percentage	Retinopathy Grades (%)	Percentage
No Retinopathy cases	134	67.0	--	--
Retinopathy cases	66	33.0	--	--
Mild NPDR			38	57.6
Moderate NPDR			19	28.8
Severe NPDR and PDR			09	13.6
Total	200	100.0	66	100.0

Table 5: Correlation between DES and DR in DM

Grade of Retinopathy	No of DM Patients	Dry eyes cases	Percentage	P value
No retinopathy	134	68	66.7	X^2=0.034
With Retinopathy	66	34	33.3	P > 0.05
Total	200	102	100.0	Not Significant

Discussion

Prevalence of DES: The study was done to determine the prevalence of DES in Type 2 diabetes mellitus patients and to determine the association of dry eyes with diabetic retinopathy, among those attending the ophthalmology OPD. In our study the prevalence of DES among the diabetics was found to be 51%. This prevalence rate is comparable to studiesdone worldwide. In the hospital based studies donein India the prevalence of DES among diabetics was 38% in Eluru, Andhra Pradesh [9], 42% in Navi Mumbai [10] and 36% in Mysore, Karnataka [11].

In studies done elsewhere in the world the prevalence of DES among diabetics was 49.8% in Kenya [12] , 54.3% in Iran [4] and 52.8% in Germany [13]. Racial and ethnicity differences in the prevalence of DES have been reported with higher prevalence of DES in Asia compared to studies in USA [14]. The high prevalence of DES in our study could be due to dry climate of our region.

DES is very common among the general population with 28% of the adults having DES [15]. However the prevalence of DES shows wide variation from 18% to 70%, which could be due to lack of standardisation of the study subjects, of the DES questionnaires, tests and diagnostic criteria of DES [9].

DES and Sex: Our study found higher prevalence of DES in females and was statistically significant. Similar comparable results were found in various other studies [4,16,17]. Androgens are known to produce trophic effects on the functioning of the lacrimal as well as the Meibomian glands. Menopause is associated with reduction in levels of androgens, resulting in dysfunctioning of both the glands and the resultant symptoms of DES [18].

DES and Age: In the present study the prevalence of DES shows an increase with age.Studies also report similar trend of increase in prevalence of DES with age [16,19]. The etiopathogenesis of DES in aging is due to reduction in production and flow of tear along with increase in evaporation of tear film [19]. Dysfunction of Meibomian gland and autonomic dysfunction have also been implicated in the increased prevalence of DES with age [20].

Clinical Test Results of Dry Eyes: The clinical test results of dry eyes in our study for different tests are 39.5%, 32%, for TBUT, Schirmer test, respectively. Similar comparable percentage results were also obtained in various other studies [9,10,11].

Among the tests for dry eyes, TBUT is said to be a very non-specific test for determination of tear film stability as variations in the same patient has been noticed [1]. Schirmer's test has been the standard test to measure the tear production [21]. Studies report that the results of the clinical tests of dry eyes do not correlate in clinical trials [9].

Association of Retinopathy with Dry Eyes: Our study reveals that there were 66 (33.0%) retinopathy cases and 134 (67.0%) no retinopathy cases. Among the retinopathy cases maximum number of cases 38 (57.6%) were with the mild NPDR, 19 (28.8%) cases were with moderate NPDR and 9 (13.6%) cases were with severe NPDR and PDR. 68 patients out of 134 with no diabetic retinopathy had dry eye and 34 out of 66 with retinopathy had dry eye which was not statistically significant. Study by Masoud Reza Manaviat et al showed dry eye syndrome was more frequent in diabetic patients with DR (P = 0.02).

DR was found in 140 patients (70.35%), which included 34 patients (17.1%) with mild non proliferative DR (NPDR), 34 patients (17.1%) with moderate NPDR, 22 patients (11.1%) with severe NPDR and 25 patients (25.1%) with proliferative DR (PDR) [4]. Pradeep Pakalapati et al have shown that there is an association between dry eye and diabetic retiopathy but it was statistically not significant [9].

Conclusion

Our study was done to know the prevalence of DES in type 11 diabetes mellitus. We found that prevalence was 51% probably due to dusty and dry weather. DES was more in females and diabetic retinopathy patients had DES though it was not statistically significant. Hence examination of dry eye should become a routine test to prevent the symptoms and structural damage to the ocular surface.

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Clinical Presentation and outcome in Cases of Orbit Lymphoma: A Prospective Interventional Study

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Abstract

Context: The origin of orbital lymphoma can be variable. It may arise from conjunctiva or likely to arise from eyelid or may happen to arise from orbit or lacrimar glands. Diagnosis is most likely to be delayed as the clinical features are not very specific.

Aims: To study clinical presentation and outcome in orbital lymphoma cases.

Settings and Design: It was a Prospective Interventional Study carried out at Sarojini Devi Eye, Hospital, Hyderabad for a period of two years.

Methods and Material: A total of 26 cases were included in the study. Only lymphoma orbit cases were included. Appropriate intervention was done depending upon the need i.e. stage, histological type, patient age and any other patient characteristics. Outcome was studied specific to the intervention carried out.

Statistical Analysis: The data was entered in Microsoft Excel Worksheet and analyzed using proportions.

Results: Male predominance was observed in present study i.e. males were 69% and females were 31%. Majority of the study participants had proptosis (23.8%) as main clinical presentation. About 19.23% had orbital & lid mass. Small Lymphocytic lymphomas were observed in 50% of the study participant, Diffuse mix small & large cell was seen in 30.7%, Diffuse large cell in 11.5% and Burkitt's lymphoma in 7.6% of cases.

Conclusion: Small Lymphocytic lymphoma was the most common orbit lymphoma found in the present study almost in half of the cases. Next most common histologic type was Diffuse mix small & large cell in about one third of the cases. Incisional biopsy & radiotherapy was the most commonly adopted intervention by us.

Keywords: Orbit; Lymphoma; Proptosis; Lid.

Introduction

Malignant Lymphomas are neoplastic transformations of cells that reside predominantly within lymphoid tissues. Lymphoid tumours are the most common primary orbital malignancy [1,2], constituting approximately 10% of all orbital tumours, 40 to 60% of lympho-proliferative disease in the orbit [3]. The majority of orbital lymphomas are Non-Hodgkin's type and are seen primarily in adults in the 50-70 years age group.

Orbital lymphomas are usually unilateral but may involve both orbits and demonstrate a predilection for the lacrimal gland. Patients with orbital lymphoma usually present with painless proptosis of insidious onset, downward displacement of the globe, eyelid edema, a palpable non tender orbital mass and ptosis. The non-Hodgkin's lymphomas (NHL) are a group of neoplasms characterized by proliferation of malignant lymphocytes. Patients with NHL have a wide variety of presenting signs and symptoms, depending largely on the site of involvement and aggressiveness of the disease [3]. Therefore the present study was conducted with the objectives to study incidence of orbital Lymphoma, and to study clinical presentation in orbital lymphoma cases.

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The origin of orbital lymphoma can be variable. It may arise from conjunctiva or likely to arise from eyelid or may happen to arise from orbit or lacrimal glands. Diagnosis is most likely to be delayed as the clinical features are not very specific. The site of origin may be at one place and the appearance of signs and symptoms may be a bit different. As for example almost one fourth of the cases occur in conjunctiva but the presentation may be with red patches [4].

Diagnosis of orbital lymphoma and its types is biopsy guided which gives perfect clue of staging also. But for staging, CT scan or if required MRI scan should be done. This imaging will help ophthalmologist to know the extent of invasion of tumor not only locally but also systemic involvement. Other tumors of orbit which are malignant or inflammatory as well as "thyroid associated orbit disease" should be ruled out to reach a final diagnosis [5].

The outcome or prognosis of lymphoma of the orbit is dependent on many factors like age of the patient, histological type of the tumor, whether the tumor was local or invasion took place and the stage of the tumor. Naturally younger the patient, histology of low grade, local tumor and early diagnosis favor the prognosis [6].

Studies of this kind i.e. clinical profile of orbit lymphoma are few. Such studies throw light on the clinical presentation, histological types, type of intervention and related outcome. This knowledge is useful.

Materials & Methods

Study Design

Prospective Interventional Study.

Study Area

Sarojini Devi Eye Hospital, Hyderabad.

Study Duration

The study was done for period of 2 years.

Ethical Consideration

The study was started after taking permission from institutional Ethical Committee

Sample Size

A total of 26 cases were included in the study.

Study Participants

- *Inclusion Criteria:* All histopathologically confirmed cases of orbital lymphoma irrespective of age and sex included.
- *Exclusion Criteria:*
  - In cases where histopathology is inconclusive even after immuno-histochemistry
  - Cases who did not report for follow up.

Methodology

A pre-designed, pre-structured questionnaire was used. The study participants were explained about the purpose of the study. A written consent was taken before the start of the study. A detailed history was taken. A detailed clinical examination was done. Detailed ocular examination such as slit lamp examination of anterior segment, cover tests, ocular motility was done. Hertel's exophthalmometry and fundus evaluation was done. Routine examination like CBP, ESR were done. CT scan brain and orbit was done. Ultrasound abdomen was done. Bone marrow aspiration with peripheral smear examination was done. Incisional/Excisional biopsy was done and sent for histopathological examination. Immunohistochemistry was done where ever needed. The patients were followed till 12 weeks.

Statistical Analysis

The data was entered in Microsoft excel sheet and analysis was done using proportions.

Results

Table 1 shows sex distribution of study participants. Male predominance was observed in present study. Males were 69% and females were 31%.

Table 2 shows distribution of study participants with side of eye involvement. Nearly about 54% of the study participants had lymphoma in right eye and 46 % had in left eye. No bilateral involvement observed.

Table 3 shows distribution of study participants with clinical presentation. Majority of the study participants had proptosis (23.8%) as main clinical presentation. About 19.23% had orbital & lid mass followed by orbital mass (11.54%), lid mass (11.54%), orbital & lid mass (11.54%) respectively

Table 4 shows distribution of study participants with site involved. Orbit-retro bulbar area and lacrimal gland was involved in 23.08% of the study participants which was followed by orbit &

conjunctiva in 15.38%, orbit & lid (15.38%), lid (11.54%) & conjunctiva (11.54%).

Table 5 shows distribution of study participants with histological type. Small Lymphocytic lymphomas were observed in 50% of the study participant, Diffuse mix small & large cell in 30.7%, Diffuse large cell in 11.5% and Burkitt's lymphoma in 7.6%.

Table 6 shows distribution of study participants with type of treatment incisional. Biopsy & radiotherapy was done in majority of the study participant's (73.07%), followed by Incisional biopsy & chemotherapy in 19.23%. Excision was done in 7.69% of study participant's.

Table 7 shows comparison between pre operative and post operative mean values of axial displacement of proptosis. It was found that their mean values of axial displacement of proptosis came to normalcy post operatively as compared to the pre operative

Table 1: Sex wise distribution of study participants

Sex	Frequency	Percentage
Male	18	69
Female	08	31
Total	26	100

Table 2: Distribution of study participants with side of eye involvement

Eye	Frequency	Percentage
Right	14	54
Left	12	46
Total	26	100

Table 3: Distribution of study participants with clinical presentation

Clinical Presentation	Frequency	Percentage
Proptosis	6	23.8
Orbital mass	3	11.54
Orbital & lid mass	5	19.23
Orbital & conjunctival mass	3	11.54
Lid mass	3	11.54
Conjunctival mass	3	11.54
Lacrimal mass	3	11.54
Total	26	100

Table 4: Distribution of study participants with site involved

Site involved	Frequency	Percentage
Orbit-Retrobulbar	6	23.08
Lacrimal gland	6	23.08
Orbit & conjunctiva	4	15.38
Orbit & lid	4	15.38
Lid	3	11.54
Conjunctiva	3	11.54
Total	26	100

Table 5: Distribution of study participants with histological type

Histological Type	Frequency	Percentage
Low Grade Lymphoma		
• Small Lymphocytic lymphomas	13	50
Intermediate Grade Lymphoma		
• Diffuse mix small & large cell	08	30.7
High Grade Lymphoma		
• Diffuse large cell	03	11.5
• Burkitt's lymphoma	02	7.6
Total	26	100

Table 6: Distribution of study participants with type of treatment

Type of treatment	Frequency	Percentage
Excision	02	7.69
Incisional biopsy & radiotherapy	19	73.07
Incisional biopsy & chemotherapy	05	19.23
Total	26	100

Table 7: Comparison between pre operative and post operative mean values of axial displacement of proptosis

mean values of axial displacement of proptosis	Pre operative Mean±SD	Post operative at 4 weeks Mean±SD	T value	P value
	17.28±1.96	15.5±1.52	3.6593	0.0006

values. The mean decreased from 17.28 to 15.5 and this reduction was found to be statistically significant. At 12 weeks all patients had normal values.

Discussion

Male predominance was observed in present study. Males were 69% and females were 31%. Nearly about 54% of the study participants had lymphoma in right eye and 46% had in left eye. No bilateral involvement observed. Majority of the study participants had proptosis (23.8%) as main clinical presentation. About 19.23% had orbital & lid mass followed by orbital mass (11.54%), lid mass (11.54%), orbital & lid mass (11.54%) respectively Orbit-retro bulbar area and lacrimal gland was involved in 23.08% of the study participants which was followed by orbit & conjunctiva in 15.38%, orbit & lid (15.38%), lid (11.54%) & conjunctiva (11.54%). Small Lymphocytic lymphomas were observed in 50% of the study participant, Diffuse mix small & large cell in 30.7%, Diffuse large cell in 11.5% and Burkitt's lymphoma in 7.6%. Biopsy & radiotherapy was done in majority of the study participant's (73.07%), followed by Incisional biopsy & chemotherapy in 19.23%. Excision was done in 7.69% of study participant's.

In Present study all 26 cases were Non-Hodkins Lymphoma's, among them 88.46% were B-cell lymphomas and 11.53% were T-cell Lymphomas. The present study findings were similar with Das D et al [7] study where 89% of the study participants were having B-cell lymphoma.

Male predominance was observed in present study. Males were 69% and females 31%. The present study findings were similar with other studies where males were more in number such as a study done by Dipankar Das et al [7] where they noted that nearly about 63% were males. In another study conducted by Narayan G et al [8] majority i.e. 68% were males.

Majority of the study participants had Proptosis (23.8%) as main clinical presentation. About 19.23% had orbital & lid mass followed by orbital mass (11.54%), lid mass (11.54%), orbital & lid mass (11.54%) respectively. In other studies too proptosis was the main presenting symptom. In a study done by Narayan G et al [8] it was noted that 100% of the study participants had proptosis as main clinical presentation. Present study findings were similar to Rey Porca C et al [9] study where 22% of the study participants had proptosis. Upper lid mass was seen in 26.3% of the study participants and conjunctival mass was seen in 15.78% in a study done by Das D et al [7].

In present study nearly about 54% of the study participants had lymphoma in right eye and 46% had in left eye. No bilateral involvement observed. In the study done by Narayan G et al [8] it had been observed that 52% of the study participants had mass in right and 8% had mass in both the eyes. In the study conducted by Tranfa F et al [10] it was found that 48% had mass in right eye. In the study carried out by Rosado MF et al [11] 90% had mass in right eye.

Orbit-retro bulbar area and lacrimal gland was involved in 23.08% of the study participants which was followed by orbit & conjunctiva in 15.38%, orbit & lid (15.38%), lid (11.54%) & conjunctiva (11.54%). In a study done by Rosado MF [11] 53% were having mass in orbit, 26% in conjunctiva and 19% in lacrimal apparatus. In a study done by Tranfa F et al [10] 64% of the study participants had mass in orbit.

Small Lymphocytic lymphomas were observed in 50% of the study participant, Diffuse mix small & large cell in 30.7%, Diffuse large cell in 11.5% and Burkitt's lymphoma in 7.6%. In the study by Tranfa F et al [10] study 50% of the lymphomas were proved as small lymphocytic lymphomas which is similar to present study. In a study by Rosado MF et al [11] study 3.2% were having small lymphocytic lymphomas.

It was found that their mean values of axial displacement of proptosis came to normalcy post operatively as compared to the pre operative values. The mean decreased from 17.28 to 15.5 and this reduction was found to be statistically significant. At 12 weeks all patients had normal values.

Conclusion

Small Lymphocytic lymphoma was the most common orbit lymphoma found in the present study almost in half of the cases. Next most common histologic type was Diffuse mix small & large cell in about one third of the cases. Incisional biopsy & radiotherapy was the most commonly adopted intervention by us.

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Clinical Profile and Management Outcomes of Infectious Keratitis in a Tertiary Eye Care Hospital

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Abstract

Context: Corneal infection is a leading cause of ocular morbidity and blindness worldwide. Infective corneal ulcers form a major threat to vision and are an important cause of treatable corneal blindness.

Settings and Design: Prospective Follow up Study.

Aims: To study the Risk factors, etiology, clinical features and to analyse the treatment modalities, response and outcomes in 150 patients of infectious keratitis.

Methods and Material: A Prospective study was done among 150 patients of infectious keratitis in a tertiary eye care hospital. History of predisposing factors and symptoms of infectious keratitis were documented. Morphology and characteristics of the ulcer were noted. Fluorescein staining was done in all cases. Patients were started on appropriate antimicrobial therapy based on clinical diagnosis, smear and culture reports. Statistical analysis used: Data entry and analysis were done by SPSS-10.0 for windows software. Chi square test was done for risk factors of infectious keratitis.

Results: Among the 150 patients, 54% were males and the mean age was 41.3 years. About 54% (81) gave history of trauma. About 44% were diagnosed as fungal keratitis, 40% bacterial keratitis, 12% viral and 4% had acanthamoeba keratitis. Overall 114 corneal ulcers healed well to medical management. Ulcers with trauma and smaller ulcers (< 3 mm) and reported within 7 days of onset of symptoms had better healing rate which was statistically significant ($p < 0.013$).

Conclusions: Bacterial and fungal corneal ulcers are equally prevalent in our population. History of trauma is a significant risk factor. Patients who presented late and fungal etiology had poor prognosis.

Keywords: Infectious Keratitis; Prospective Study; Follow up Study; Hypopyon; Keratoplasty; Corneal Ulcer.

Introduction

Corneal infection is a leading cause of ocular morbidity and blindness worldwide [1]. Corneal opacity due to central corneal ulcer is a major cause of monocular blindness in developing countries [2]. The incidence of microbial keratitis is still high in developing countries, due to lack of medical awareness and inaccessibility to medical treatment [3].

According to a study, the annual incidence of corneal ulcers in south India is 10 times higher than in developed countries like USA [4]. The causative organisms differ from region to region and according to the source of economic income. For example, a country with agricultural based economy encounters more fungal-related keratitis. Traumatic corneal ulcers are more frequent in our country [5]. Early diagnosis and proper treatment is important in preventing vision threatening complications. Due to their high incidence and potential complications, infective corneal ulcers form a major threat to vision and are an important cause of treatable corneal blindness [6].

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Objectives

The Aims of our Study are:

To study the Risk factors, etiology, clinical features and to analyse the treatment modalities, response and outcomes in 150 patients of infectious keratitis.

Materials and Methods

A Prospective Follow up study was done among 150 patients of infectious keratitis in a tertiary eye care hospital, Chennai. Ulcers of noninfective etiology and neurotropic ulcers were excluded from the study.

Selection of Cases

All cases of infective corneal ulcers identified clinically and with positive cultures were studied and analysed. Corneal ulcer was defined as a loss of corneal epithelium with underlying stromal infiltration with or without suppuration associated with signs of inflammation with or without hypopyon.

History Taking

A detailed history was taken in all patients. History of predisposing factors like trauma, traumatizing agents like stick, sand, vegetable matter, contact lens wear, etc were obtained. Symptoms of pain, redness, watering, photophobia, visual disturbances and their duration and onset and treatment history were documented. History of associated systemic illness like diabetes was noted.

Examination

Detailed slit lamp examination was done. Morphology and characteristics of the ulcer like the size, shape, margin, surface, depth, stromal infiltration, vascularisation, and hypopyon were noted. Fluorescein staining was done in all cases.

Laboratory Investigations

Slit lamp guided scraping from the edge of corneal ulcer was done in almost all cases for confirmation of clinical diagnosis except those of peripheral ulcers of less than 2mm responding to topical antibiotics and those of viral keratitis. It was done under topical anaesthesia using proparcaine drops with a sterile 15 no. blade. Gram's staining, 10% Potassium Hydroxide (KOH) wet mount was done with material from scrapings. The scrapping materials were also inoculated onto blood agar, chocolate agar, non-nutrient agar, Sabouraud's dextrose agar in rows of C-shaped streaks. Routine laboratory investigation should always include both bacterial and fungal media by the standard C-streak method [7]. Random blood sugar levels were done for all patients. Liver function tests were done in cases where systemic antifungal drugs were indicated.

Treatment

After getting informed consent from the patients who were included in our study they were started on appropriate antimicrobial therapy either as monotherapy or combination therapies based on clinical diagnosis and smear and culture reports. The selection of antibiotics can be in the form of specific agents or a combination therapy [8]. Voriconazole is a new, promising therapy for fungal keratitis that is refractory to standard antifungal agents [9]. Also, cycloplegics (1% atropine eye drops) twice a day was given to all patients. If there is increased intraocular pressure, Tab. Acetazolamide 250 mg was added. Oral Anti-inflammatory drugs were given for severe, painful ulcers.

Follow- up

Daily slit lamp examination was done for all patients to assess the size, depth and extent of ulcer. Presence and size of hypopyon if any was noted. Depending on signs of improvement, patients were followed up at appropriate intervals. In all progressing ulcers, daily wound debridement was done using sterile No.15 blade. Timely surgical intervention was done whenever needed. Surgery when performed with 8 mm or smaller diameter donor grafts had better results than larger grafts [10].

Data Compilation and Analysis

Data entry and analysis were done by SPSS-10.0 for windows software. Percentages and p values were estimated. Chi square test was done for risk factors of infectious keratitis.

Results

The present study was done in a tertiary eye care hospital which included 150 patients of infective corneal ulcer. The maximum number of patients were

in the age group 11-50 years who accounted for around 62% of cases, as they are more involved in outdoor and physical activities. The mean age of presentation was 41.26 years. In our study, 54% of patients were males and 46% were females .

Outdoor workers were mainly labourers and farmers who constituted 36% of cases. Housewives (24%) sustained injury due to domestic trauma like finger nail injury etc. About 54% patients had history of corneal trauma. Out of these 8% had injury with vegetable matter. The remaining 46% had injury with dust/stick and others. 12% were contact lens users. Details are given in Figure 1. Only 14% of the patients sought proper treatment within 2 days to a specialist centre. About 42% reported within a week. 28% reported between 8 and 14 days and 16% reported after 15 days. Details are given in Figure 2. About 81 patients had history of trauma to the eye involved. At the first visit, 74 patients presented with visual acuity better than 6/12. About 66 had visual acuity between 6/18 and 6/60. 3cases presented with visual acuity less than 6/60. 3 patients came as late referral and had only perception of light (PL+). Almost 66% of cases presented with ulcer of size between 2-5mm. Likewise, around 72% patients showed infiltration limited to anterior 1/3rd of stroma. In 28% posterior 2/3rd of stroma was involved. Ulcers more than 5 mm with posterior 2/3rd stromal infiltration are aggressively treated with anticipating complications. About 36% patients had hypopyon ulcers. Details are given in Table 1.

Among the corneal scrapings, Gram's staining showed positivity in 60 cases, out of which 48 showed Gram positive organisms and 12 gram negative. KOH wet mount was positive in 45 cases of fungal ulcer and 21 patients were KOH negative, this may be because of prior treatment taken elsewhere and application of antifungal drugs.

Table 1: Risk factors, Clinical presentation and Corneal Ulcer Morphology

	N	Percentage
H/O trauma		
Present	81	54
Absent	69	46
Visual acuity at presentation		
>6/12	72	48
<6/12 to 6/60	66	44
<6/60 to CFCF	9	6
PL+	32	
Size of the ulcer		
< 2mm	24	16
2 to 5 mm	99	66
>5 mm	27	18
Stromal infiltration		
< 1/3 rd stroma	108	72
>1/3 rd stroma	42	28
Hypopyon		
Present	54	36
Absent	96	64

Table 2: Types of Corneal Ulcer and Management Outcomes

Types	N	Percent
Bacterial	60	40
Fungal	66	44
Viral	18	12
Acanthamoeba	64	
Outcomes:		
Healed ulcers with medical management	114	76
Ulcers not responded to medical therapy	30	20
Rapidly worsened ulcers	6 4	

Based on clinical findings, smear reports and culture sensitivity, 40% were bacterial ulcers, 44% were fungal ulcers, 12% viral and 4% were acanthamoeba keratitis. Out of 150 patients, 114 healed well with medical management and 36 cases were taken up for therapeutic penetrating keratoplasty either due to impending perforation or not responding to medical therapy. Details are given in Table 2 The mean treatment duration was 26 days. 40% healed well within 14 days and 36% within 28 days and the rest 24% had prolonged treatment. After therapeutic penetrating keratoplasty, 30 patients were doing well with no recurrence in the graft. 6 fungal ulcer cases who presented to us late, in spite of therapeutic penetrating keratoplasty had rapid worsening of disease with suppurative keratitis to endophthalmitis. On Statistical analysis of the data by using Chi-Square tests, healing of ulcers was better in younger patients less than 40 years, and was statistically significant (p value 0.003), this may be

Table 3: Association between age, history of trauma, duration of complaints, ulcer size and corneal ulcer healing.

S. No.	Parameters	Ulcer Healed	Ulcer not Healed	pvalue
1	Age			
	<40 years	75	6	0.003
	> 40 years	39	30	
2	History of trauma			
	YES	48	30	0.013
	NO	66	6	
3	Duration of complaints			
	< 7 DAYS	75	9	0.013
	> 7 DAYS	39	27	
4	Ulcer size			
	<3mm	93	18	0.030
	> 3mm	21	18	

Fig. 1:

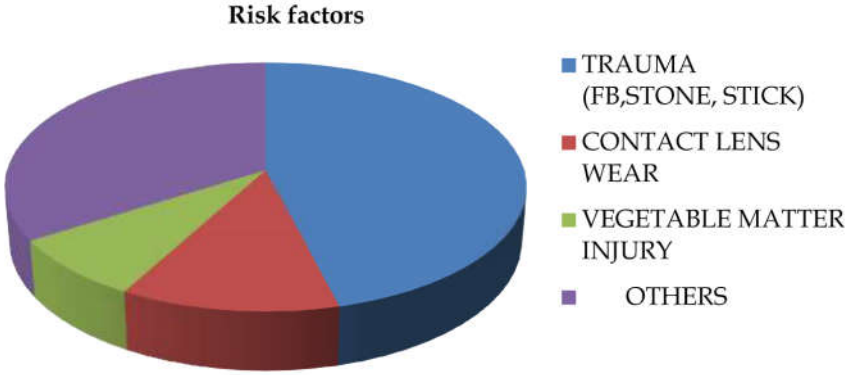
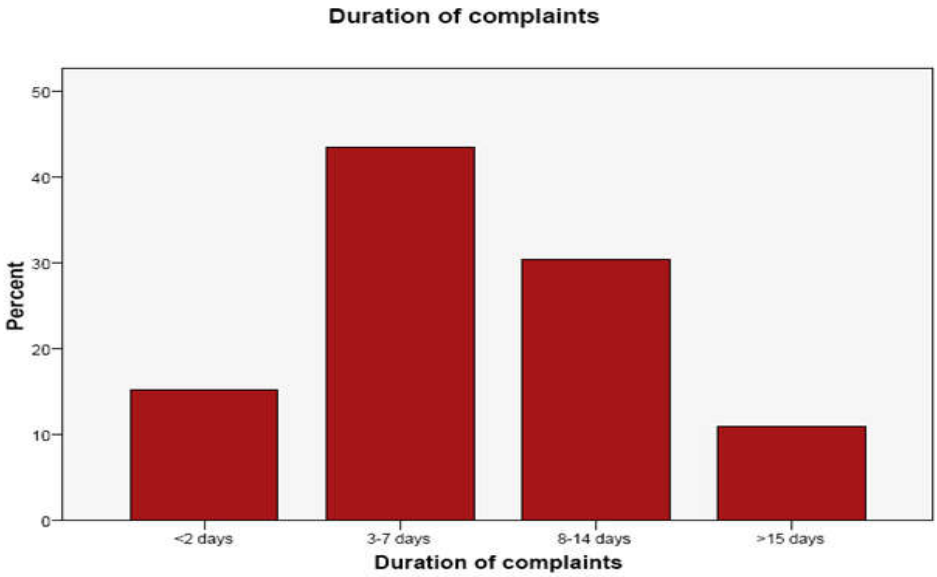


Fig. 2:



because of absence of risk factors like Diabetes which may impair the healing process. Traumatic corneal ulcers were found to have less healing rate than non traumatic ulcer group which was statistically significant (p value 0.013), Smaller ulcers of less than 3 mm and those who presented early in the course of disease within 7 days of onset of symptoms had better healing rate which were also statistically significant (pvalue 0.013 & 0.030). Details are given in Table 3.

Discussion

The present study of 150 patients of infective corneal ulcer have been analysed and the results compared with other studies as follows.

In the present study, 38% were in the age group of 10-30 years and 24% between 31-50 years and 36% were over 50 years. Similar results were seen by M. R. Shoja et al [11] in a cross sectional prospective study of 80 cases of microbial keratitis studied that the highest frequency belongs to the 40 to 50 age group. In this study, out of 150 cases, 46% had trauma with foreign body, stone etc., 8% had injury with vegetable matter and 12% were contact lens users. Trauma to eyes is very common in patients doing field work and factory workers because no personal protective measures are taken by our population. Similar findings were also observed in the studyby Norina T J et al [12] in an analytical study of 42 patients of infective keratitis found that history of recent eye injury was obtained from 26 (62%) patients,injury involving vegetative materials, such as paddy stalk, wood and grass, contributed 30% of cases and nine (21%) of the patients were contact lenses. Sudesh K Arya et al [13] in his study with 28 cases of bacterial keratitis, predisposing factors were present in 12 patients. Injury with vegetative matter and dust were the commonest predisposing factors followed by mechanical trauma and injury with iron nail .

In our study, only 21 patients out of 150 (14%) reported to us within 2 days, 63 patients (42%) presented within 3-7 days and 66 cases either reported first time or came as referred patient after 7 days of onset of complaints. Patients who presented within 7 days had a statistically significant improved healing rate than those who presented after 7 days. The present study coincides with the results of Rafael LacerddaFurlanetto RL et al [14], in their study reported that symptoms at presentation ranged from 1-3 days in 16 patients out of 65 (24.61%), 4-7 days in 19 cases (19/65; 29.23%), and more than 7 days in 27 patients (27/65; 41.53%).

In our study, bacterial and fungal infections occurred almost with equal frequency, the predominant bacterial and fungal species isolated being *Staphylococcus aureus* and Aspergillus species respectively. Thestudy done at L V Prasad Eye Institute, Hyderabad, showed that 71.9% of all cases of ulcerative keratitis were culture positive. Of the culture positive cases 63.9% were bacterial, 33% were fungal, 2.1% were parasitic, and 6.2% were due to mixed infection [15]. Similar results were also seen in the studies of Keshav BR et al [16], Bharathi MJ et al [17] and JS Titiyal et al [18], This was also supported by studies of M.R. Shoja et al showing that there is a region wise variation in the predominance of corneal pathogens.

Our study also showed that there was a significant association between early treatment and healing. Out of 84 ulcers that presented within 7 days of onset of symptoms, 75 healed well and among 66 patients who presented after 7 days of onset of symptoms,39 healed better. Overall 36 patients did not respond to medical management and proceeded to therapeutic penetrating keratoplasty. J S Titiyal et al showed that delay in starting definite treatment is a risk factor for perforation in corneal ulcers. In our study of 150 patients, 114 healed well (54 out of 60 bacterial, 36 out of 66 fungal, 6 acanthamoeba and 18 viral) responding to medical management. Follow up of the patients who had improvement with medical therapy showed a healed maculo leucomatous scar. About 30 patients had non healing ulcers, out of which 9 patients had impending perforation and 21 patients did not improve in spite of maximum medical management, this can be attributed to the virulence of organism or due to poor host immunity as in diabetics over 40 years of age and showed clinical improvement by therapeutic penetrating keratoplasty. Remaining 6 patients of fungal ulcer that came to us late as referral patients had fulminant aggressive ulcer which was progressing even after therapeutic penetrating keratoplasty, with florid iris new vessels and suppurative scleritis and had rapid worsening of disease to endophthalmitis. Norina T J et alin their retrospective study of fungal keratitis in Singapore showed that almost half of their cases required therapeutic penetrating keratoplasty due to the involvement of central large persistent nonhealing ulcers.

Conclusion

Infectious keratitis remains a therapeutic challenge and a vision threatening ocular condition. Bacterial

and fungal ulcers are equally prevalent in our population. Trauma is a significant risk factor for development of corneal ulcer. Patients who presented late in the course of disease and those of fungal etiology had poor prognosis, not responding to medical treatment requiring therapeutic penetrating keratoplasty. Patient education regarding personal hygiene, early approach to ophthalmologist following eye trauma, frequent eye medications and regular follow up are important in preventing complications.

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Key Messages

Infectious keratitis remains a therapeutic challenge and vision threatening ocular condition. Patient education regarding personal hygiene, early approach to ophthalmologist following eye trauma, frequent eye medications and regular follow up are important in preventing complications

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Optical (Partial Optical Coherence Interferometry) (AL-Scan) versus Ultrasound Biometry (A-Scan) for IOL Power Calculation: A Comparative Study

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Abstract

Context: The refractive power of the human eye depends on the power of the cornea and the lens, the position of the lens, and the length of the eye. Accurate assessment of these variables is essential in achieving optimal postoperative refractive results. *Aims:* To compare the accuracy of IOL power calculation by measuring the axial length with Optical (Partial Optical Coherence Interferometry AL-Scan) biometry and Ultrasound biometry.

Settings and Design: It was a prospective observational study done at Medivision eye and Health Care centre.

Methods and Material: The study group was 200 patients, who underwent Phaco-emulsification. The SRK-T formula was used to calculate the IOL power in all patients. Auto-keratometry performed with the optical scan was used in all patients.

Statistical Analysis: Mean (SD) and frequency (percentage) was used to describe summary data. Paired T test was performed to explore statistically significant difference between two measurements. Chi-square was used to assess the difference between categorical variables.

Results: Out of 200 patients 83 (41.5%) were female and 117 (58.5%) were male. Mean Age of the study population was 62.30±7.66 years and the range 33 to 81. The mean difference between axial lengths measured by the 2 modalities was 0.1274±0.1733 mm with AL Scan measuring higher than US Biometry (Paired T- Test $p < 0.05$). The residual error was Zero in 75 (37.5%) eyes in the AL-scan group and 59 (29.5%) eyes in the A-scan group. When analyzed at 95% confidence for the difference at zero error in pre-operative prediction versus post-operative acceptance of IOL power, the predictions did not differ between both the modalities.

Conclusion: The AL-scan is on average a closer predictor than A-scan of the final spherical equivalent. AL-scan may offer a slight advantage because of the easier and quicker operation compared with the A-scan.

Keywords: Axial; A-Scan; Eye; Phacoemulsification.

Introduction

The refractive power of the human eye depends on the power of the cornea and the lens, the position of the lens, and the length of the eye. Accurate assessment of these variables is essential in achieving optimal postoperative refractive results. If these biometric measurements and calculations are inaccurate, the patients may be left with a significant refractive error. Studies conducted by Olsen [1] showed that imprecision in measurements of anterior chamber depth (ACD), axial length and corneal power contribute to 42%, 36% and 22%, respectively, of the error in predicted refraction after implantation of an intraocular lens (IOL). Currently, the axial length can be obtained by using either A Scan Ultra Sound or the partial coherence laser interferometer. In A-scan ultrasound biometry, a crystal oscillates to generate a high-frequency sound wave that penetrates into the eye. When the sound wave

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encounters a media interface, part of the sound wave is reflected back toward the probe. These echoes allow us to calculate the distance between the probe and various structures in the eye.

A non-contact partial coherence laser interferometer, as an alternative technique to measure the axial length of the eye was used. It measures the delay and intensity of infrared light reflected back from media interfaces in order to determine the distance from the cornea to the retinal pigment epithelium [2].

Accurate Biometry is needed to obtain satisfactory postoperative results, more than ever as a result of heightened patient expectations. The IOL master has been in use for several years and measures AL (axial length), ACD (anterior chamber depth) and corneal curvature with high precision and good resolution [2]. The IOL master is a better predictor of postoperative refraction than ultrasound biometry, particularly within close ranges [5]. The use of optical biometry offered a better predictive value than the use of applanation axial biometry measurement [6]. The axial length measurements taken with IOL master were slightly affected by the cataract density but to a lesser extent than ultrasound biometry [7]. However; several other studies [8-13] demonstrated that optical biometry represents a significant simplification in the course of investigation prior to cataract surgery.

Hence present study was carried out to compare the accuracy of IOL power calculation by measuring the axial length with Optical (Partial Optical Coherence Interferometry AL-Scan) biometry and Ultrasound biometry.

Materials and Methods

Study Area

Medi-vision Eye & Health Care Center, Hyderabad

Study Design

Patients with Cataractous lens undergoing Phacoemulsification with foldable IOL implantation

Study Participants

Prospective observational study

Sample Size Calculation

To detect the differences of refractive errors of 0.25 D of spherical equivalent (power 90%; α-0.05) between patients with Partial coherence interferometry (AL-scan) calculated IOL power and ultrasound biometry (A-scan) calculated IOL power and assuming 10% loss to follow-up a minimum of 174 sample size was required.

Inclusion Criteria

Patients who are undergoing cataract surgery.

Exclusion Criteria

- Corneal disease
- Traumatic cataract
- Previous intraocular surgery
- Pre-existing glaucoma
- Patients with poor visual prognosis (ex: amblyopia, macular scar)
- Uncooperative patients

Methodology

Patients selected for surgery for them a complete ophthalmic examination including refraction, slit lamp examination; four mirror Gonioscopy to look for any angle abnormalities, Goldman applanation tonometry and Fundus examination through dilated pupil by direct and indirect ophthalmoscopy was done. B-scan was done if fundus examination was not possible as in dense cataract cases.

AL-scan was first performed before any applanation method and ultrasound biometry (ALCON) performed for IOL calculation. A single experienced optometrist had done the ultra sound (A-scan) and Partial Coherence Interferometry (AL-scan) measurements in all cases. The SRK-T formula was used to calculate the IOL power in all patients. The reliability of measurements was assessed by ideal graph/SNR in IOL biometry and retinal spikes in acoustic biometry. To eliminate the confounding variables introduced by keratometer performed with different techniques on treatment group, auto-keratometry performed with the optical scan was used in all patients.

The A constant was individualized for the IOL chosen by the patient. Cataract surgery by Phacoemulsification (2.8 mm temporal clear corneal tunnel) method was done and a foldable lens was implanted within the capsular bag under topical anaesthesia.

Postoperative assessment was performed at 1st post-operative day, 1st week, 2nd week, and 1 month and 6 weeks. The latest available refraction was used as final refraction and was converted into spherical equivalent and compared with the pre-operative predictions made by the Optical Scan and Ultrasound Biometry. All postoperative assessments were made by the same examiner. Informed consent was taken from all the study subjects. Ethical committee approval taken from the institute's ethical board.

Statistical Analysis

Mean (SD) and frequency (percentage) was used to describe summary data. Paired T test was performed to explore statistically significant difference between two measurements (Optical Scan and Ultra sound biometry). Chi-square was used to assess the difference between categorical variables. Differences considered statistically significant when the P value is <0.05.

Results

Table 1 shows mean Age of the study population was 62.30±7.66 years and the range was 33 to 81. Majority 109 (54.5%) of patients were in the age group 61-70 years.

Table 2 shows that patient population included in the study was almost equally distributed with 41.5% (n=83) female patients and 58.5% (n=117) male patients.

Table 3 shows that Mean Axial length measurement by AL-Scan (optical scan) was 23.21 mm with standard deviation of 1.00 mm

Table 4 shows that the mean axial length measurement by A-Scan (ultra sound scan) was 23.11 mm with standard deviation of 1.00 mm.

Table 5 shows that the residual error was Zero in 75 (37.5%) eyes in the AL-scan group and 59 (29.5%) eyes in the A-scan group. The residual error was more than 0.50 D in 24 (12%) eyes and 0.50 D or less in 101 (50.5%) eyes in the AL-scan group. In the A-scan group the residual error was more than 0.50 D in 29 (14.5%) eyes and 0.50 D or less in 112 (56%) eyes. It is also observed that the predictions made by A-Scan tend to be more frequent on lower (negative) side compared to that of AL-Scan though both look to be equal in most of the cases

Table 6 shows that the mean difference between axial length measured by the 2 modalities was 0.1274 mm with a standard deviation of 0.1733 mm (95% CI 0.104 – 0.152) with AL Scan measuring higher than US Biometry.

Table 7 shows that the mean difference between axial length measured by the 2 modalities was 0.0142 mm with a standard deviation of 0.3646 mm (95% CI 0.0367 – 0.065).

Table 8 shows that the prediction precision of IOL Power by both the modalities was compared with that of accepted power of IOL after adjusting for the residual error in the following tables in paired T-test.

The mean (SD) difference between the predicted refraction and final spherical equivalent was +0.0142 (SD 0.3646) D for the AL-Scan and +0.1242 (SD 0.4010) for the A-Scan. This finding demonstrates that, on average, the AL-Scan was a closer predictor (p=0.584) than the A-Scan of the final spherical equivalent (p<0.05).

Table 1: Age wise distribution of sample

Age (years)	Number	Percentage
31-40	03	1.5
41-50	14	07
51-60	56	28
61-70	109	54.5
71-80	17	7.2
> 80	01	0.5
Total	200	100

Table 2: Gender wise distribution of sample

Gender	Number	Percentage
Male	117	58.5
Female	083	41.5
Total	200	100

Table 3: Pre-Operative Axial Length Measurements by AL Scan

Range of axial length	AL scan	
	Number	Percentage
20-20.99	2	1
21-21.99	20	10
22-22.99	64	32
23-23.99	77	38.5
24-24.99	32	16
25-25.99	03	1.5
26-26.99	01	0.5
27-27.99	01	0.5
Total	200	100

Table 4: Pre-Operative Axial Length Measurements by A-Scan

Range of axial length	A scan	
	Number	Percentage
20-20.99	2	1
21-21.99	24	12
22-22.99	70	35
23-23.99	75	37.5
24-24.99	25	12.5
25-25.99	02	01
26-26.99	01	0.5
27-27.99	01	0.5
Total	200	100

Table 5: Difference between predicted refraction and the final spherical equivalent with different scans

Range of residual power in Diopters	AL scan Number	Percentage	A scan Number	Percentage
-1.00	0	0	1	0.5
-0.75 to -1.00	4	2	9	4.5
-0.50 to -0.75	13	6.5	14	07
-0.25 to -0.50	16	8	30	15
0 to -0.25	27	13.5	42	21
0	75	37.5	59	29.5
0 to 0.25	37	18.5	19	9.5
0.25 to 0.50	21	12.5	21	12.5
0.50 to 0.75	05	2.5	03	1.5
0.75 to 1.00	02	01	02	01
1.00	0	0	0	0
Total	200	100	200	100

Table 6: Comparison of axial lengths measured by AL-Scan and Ultrasound scan

	Paired differences					T value	df	Significance (2 tailed)
	Mean	Standard deviation	Standard error of mean	95% C. I. Lower	Upper			
AL scan axial length USB AxLgth	0.1274	0.1733	0.0123	0.1032	0.1515	10.394	199	0.0001

Table 7: Comparison of predicted refraction by AL-Scan versus Final spherical equivalent

	Paired differences					T value	df	Significance (2 tailed)
	Mean	Standard deviation	Standard error of mean	95% C. I. Lower	Upper			
Final Spherical Equivalent – Residual Power by AL-Scan	0.0142	0.3646	0.0258	0.0367	0.065	0.549	199	0.584

Table 8: Comparison of predicted refraction by A-Scan versus Final spherical equivalent

	Paired Differences							
	Mean	Standard deviation	Standard error of mean	95% C. I. Lower	Upper	T value	df	Significance (2 tailed)
Final Spherical Equivalent – Residual Power by A-Scan	0.1242	0.4010	0.0284	0.0682	0.1801	4.378	199	0.0001

Table 9: Comparison of prediction precision of residual error with Al-Scan and A-Scan (spherical equivalent) at zero error

Error	AL scan	A scan	Chi square	P value
Zero error	75	59	2.8729	0.09
Any error	125	141		

Table 9 shows that at 95% confidence for the difference at zero error in pre-operative prediction versus post-operative acceptance of IOL power, the predictions did not differ between both the modalities (The Chi-square statistic is 2.8729. The P value is 0.09). When observed for the final outcomes of both the modalities it was seen that the overlapping residual error of +0.50 was seen in 83% of eyes.

Discussion

The present study included 200 eyes of 200 patients who underwent cataract surgery. Out of 200 patients 83 (41.5%) were female and 117 (58.5%) were male. In another study 65% were female's ad 35% were males [8].

In the present study the mean age of the study population was 62.30±7.66 years and the range 33 to 81. In another study, the mean age of patients was 69.8±13.1 years (range, 11 – 85 years) in the PCI Group and 70.0±9.3 (range, 45 - 86 years) in the US Group (P = 0.7165) [8].

In the present study the mean axial length measurement by AL-Scan (optical scan) was 23.21±1.00 mm while the mean axial length measurement by A-Scan (ultra sound scan) was 23.11±1.00 mm. In another study the mean AL measured by the PCI was 23.22±1.00 mm (range, 21.01 - 25.45 mm) and that measured by US was 23.22±1.06 mm (range, 20.05 - 25.78 mm) (P = 0.9110); years (range, 11 – 85 years) in the PCI Group and 70.0±9.3 (range, 45 - 86 years) in the US Group (P = 0.7165) [8].

In the present study the mean difference between axial lengths measured by the 2 modalities was 0.1274±0.1733 mm with AL Scan and the difference was statistically significant. In the study conducted by Anand B Bhatt et al [5] the mean axial lengths measured by IOL master and ultrasound biometry were 23.97 and 23.92 mm, respectively. The mean difference between the axial lengths measured by the two modalities was 0.042. In the study conducted by Beatiz Machado Fontes et al [8] the mean axial length measured by PCI was 23.22±1.0 mm and that measured by US was 23.22±1.06 mm.

In the study conducted by Findl O et al [14] the optical axial length obtained by the IOL Master was significantly longer ($p < 0.001$, Student's t test) than the axial length by applanation ultrasound, 23.36 (SD 0.85) mm vs. 22.89 (0.83) mm. Possibly the most important reason for this difference is the pressure exerted on the eye by the ultrasound probe, which results in corneal indentation and shortening of the AL. In addition, the ultrasound is reflected mainly at the internal limiting membrane whereas the light of the IOL Master at the retinal pigment epithelium, thus resulting in a difference that corresponds to the retinal thickness of the fovea, which is about 130 micron [14].

In the present study the mean (SD) difference between the predicted refraction and final spherical equivalent was +0.0142 (SD 0.3646) D for the AL-Scan and +0.1242 (SD 0.4010) for the A-Scan. This finding demonstrates that, on average, the AL-Scan was a closer predictor ($p = 0.584$) than the A-Scan of the final spherical equivalent ($p < 0.05$). The present study findings were similar another study were the mean (SD) of the difference between predicted refraction and final spherical equivalent was -0.43 (0.84) diopters (D) for the IOL m and -0.60 (0.87) D for ultrasound biometry, indicating that on average the IOL m was a closer predictor than ultrasound biometry of the final spherical equivalent ($P < .001$) [5].

The residual error was Zero in 75 (37.5%) eyes in the AL-scan group and 59 (29.5%) eyes in the A-scan

group. The residual error was more than 0.50 D in 24(12%) eyes and 0.50 D or less in 101 (50.5%) eyes in the AL-scan group. In the A-scan group the residual error was more than 0.50 D in 29 (14.5%) eyes and 0.50 D or less in 112 (56%) eye.

It is also observed that the predictions made by A-Scan tend to be more frequent on lower (negative) side compared to that of AL-Scan though both look to be equal in most of the cases

On comparing the prediction precision of IOL Power by both the modalities with that of accepted power of IOL after adjusting for the residual error the mean (SD) difference between the predicted refraction and final spherical equivalent was +0.0142 (SD 0.3646) D for the AL-Scan and +0.1242 (SD 0.4010) for the A-Scan. This finding demonstrates that, on average, the AL-Scan was a closer predictor ($p = 0.584$) than the A-Scan of the final spherical equivalent ($p < 0.05$). With use of the SRK-T formula to obtain predictions for postoperative refraction, the AL-scan was 0.11 D more accurate than A-scan biometry in predicting the final spherical equivalent.

In our study it was observed that AL-scan is on average a closer predictor than A-scan of the final spherical equivalent but when analyzed at 95% confidence interval at zero error there was no statistically significant error between the two modalities. In another studies it was found that s high precision and reproducibility was obtained with both methods [8,15,16,17].

When observed for the final outcomes of both the modalities it was seen that the overlapping residual error of +0.50 was seen in 83% of eyes.

Conclusion

AL-scan offer a slight advantage because of the easier and quicker operation compared with the A-scan. For the surgeon who wants to continue using A-scan biometry there is no significant disadvantage. The advantage of A-scan biometry is that very dense ocular media prevent obtaining axial length measurements by AL-Scan while still A-Scan could give axial length measurements. However, these cases were excluded from our study due to lack of AL-Scan measurements.

Key Messages

For the surgeon who wants to continue using A-scan biometry there is no significant disadvantage.

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Original Article

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Prevalence of Ocular Morbidity among Children in Orphanages around Hubli, North Karnataka

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Abstract

Aim: To determine the prevalence of ocular morbidity among orphanages and to manage ocular problems encountered among children.

Materials and Methods: A Cross sectional study was carried out at two orphanages in Hubli, Karnataka. A total of 80 children aged less < 15 years were examined after informed consent from the owner of orphanages. History was taken and visual acuity, ocular examination, retinoscopy and fundoscopy was done on all children.

Results: A total of 80 children were examined from two orphanages in Hubli. Percentage of ocular morbidity was found to be 38.75%. The two main causes of ocular morbidity among children were refractive errors (22.5%) and vitamin 'A' deficiency (7.5%). Blepharitis was found among 3 children (3.75%) and pthyriasis among 2 children (2.5%). Nebular grade corneal opacity and acute infective conjunctivitis each was found among one child.

Conclusion: Percentage of ocular morbidity in this study is significant. This study strongly suggest that screening of orphanage children for ocular problems should be done at regular intervals.

Keywords: Prevalence; Ocular morbidity; Orphanages; Refractive errors.

Introduction

The term 'orphan' is used to refer to a child who has lost either one or both parents. Once child loses a parent or both parents, such a child may be adopted by relatives from either of the parent's families or may be sent to an orphanage. In most cases adopting parents live in different environments with which a child may or may not be familiar. There are almost always associated physical and psychological problems [1].

Since a large number of children have to be taken care of in orphanages; there is severe economic strain and burden. Orphanages were found to be less able to inculcate discipline and adequate socialization among children. It is difficult to provide even basic needs like food, decent living conditions and health care due to financial constraints and negligence. Because of these a child might develop multiple health problems, ocular health problems being one of them [2].

Some agencies such as UNICEF, world vision and Save the children fund (UK) [3] have devised special intervention programs to enable children to cope with orphanhood.

Inspite of these many of the orphaned children continue to experience emotional problems and health problems. If ocular health problems are not detected in time, then serious long term complications can occur like child may lose vision because of amblyopia due to chronic uncorrected refractive errors [4,5]. There are very few studies of such kind so that prevalence of ocular morbidity among children in orphanage is largely unknown. Hence the present study was carried to determine the prevalence of ocular morbidity among orphan children in Hubli, Karnataka.

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Aims and Objectives

1. To determine the prevalence of ocular morbidity among orphan kids.
2. To manage ocular problems among orphan kids.

Materials and Methods

This study was conducted among 80 children in two orphanages in Hubli, Karnataka during the month February 2016 to April 2016. The required permission for screening of the children was obtained from concerned authority of an orphanage. They were briefed about the aims and objectives of the study.

All childrens aged 5 to 15 years in an orphanage were included in the study. About 80 children were examined. Brief demographic details, medical and family history of each child was recorded. Visual acuity testing using snellen chart and E chart was done. Anterior segment examination was done with torch light.

Abnormalities in head posture with special attention for squint was observed. Child with diminution of vision or any other ocular problems were called to KIMS hospital and detailed examination under slit lamp and refraction under cycloplegia was done. A detailed fundus examination was done.

Results

A total of 80 children from two orphanages in Hubli were included in the study.

Among the 80 children, 72 were male and 08 were female children. All children above 5 years and below 15 years were included in our study. Among them 23 children were in 5-10 year group, 22 children were in 11-12 year group and 35 children were in 13-15 year group.

Ocular health problems were found among 38.75% (31 children).

Refractive errors were found to be as most common cause of ocular problems which was among 22.5% i.e in 18 children. Myopia was found to be most common cause of refractive error which was found among 12 children (15%). Signs of vitamin A deficiency were found among 6 children (7.5%). Blepharitis was found in 3 children (3.75%) and pthyriasis was found among 2 children (2.5%).

Nebular grade corneal opacity was found among 1 girl child and acute infective conjunctivitis in one child.

19 children were having uncorrected visual acuity of less than 6/6 which was checked with snellen 'E' charts.

The girl child with nebular grade corneal opacity was having visual acuity as 6/36 which was not improving with pin hole.

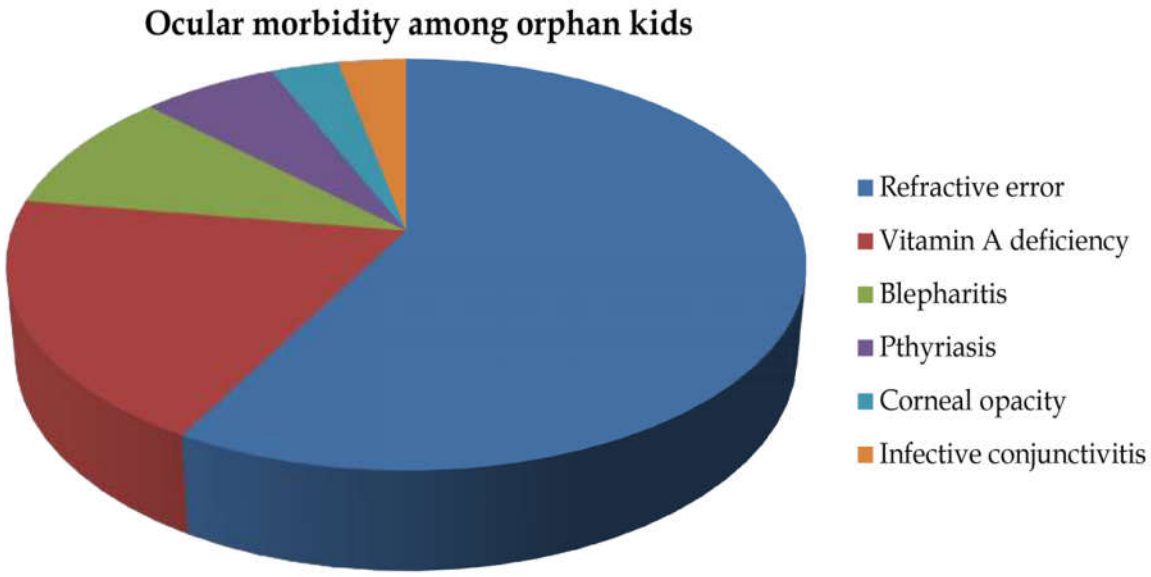

Fig. 1: Pie chart showing pattern of ocular morbidity among orphan kids

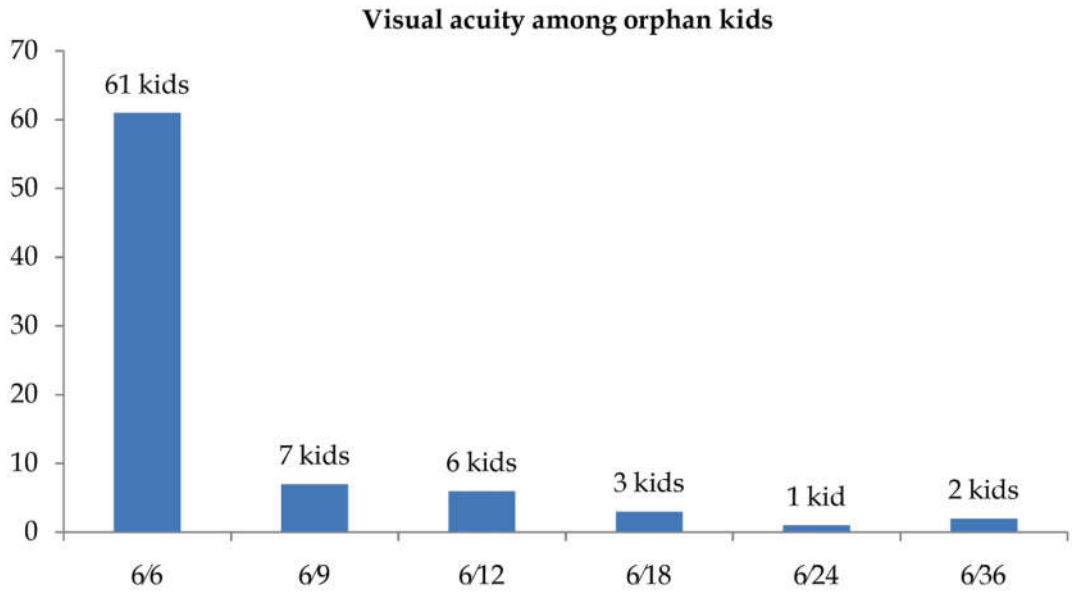

Fig. 2: Bar diagram showing visual acuity pattern among orphan kids

Discussion

Healthy eyes and vision are a critical part of a child's daily living and development. Sometimes children are suspected of having learning disabilities, dyslexia or attention deficit problems when the real culprit is their defective vision. Hence vision plays an important role in overall performance of a child.Serious irreversible complications may occur if ocular problems are not treated on time. Orphan kids are one of the vulnerable group for such things.

Ocular morbidity in orphan children has been found to range from 9.8% to 33.7% in different studies [6-8]. Percentage of ocular morbidity in this study is 38.75%, which is higher than study which was carried out in Nepal (31.6%) [7].

Refractive errors were found to be most common cause of ocular morbidity in this study which is 22.5%, among them myopia was found to be present in 12 children (15%) which was found to be the most common refractive error in this study. Best corrected visual acuity was 6/6 for all children with refractive error after giving correction. None of the children with refractive error were using spectacles previously.

Signs and symptoms of VIT A deficiency in this study i.e. bitot's spot and dry lustreless cornea was found in 6 children (7.5%) which was second most common cause of ocular morbidity in this study.

Infective conditions of lids and eyelashes like blepharitis and pthyriasis was found to be third most common cause of ocular morbidity in this study. The reason behind this finding could be due to poor hygiene and living condition of the orphan children.

Nebular grade corneal opacity which was present in pupilary area found in one girl child. She was giving history of pain, redness and photophobia 6 moths back. This could be due to untreated keratitis.

Limitation of this study is overall difference in percentage of ocular morbidity in males and females couldn't be made out as out of two orphanages studied one was made only for males. But other studies shows prevalence of infectious diseases like conjunctivitis and blepharitis more among females because of increased use of common ocular cosmetic material [10,11].

Conclusion

In this study, we found that refractive errors were the most common cause of ocular health problem prevalent among children followed by vitamin A deficiency. This study strongly suggest that screening of orphanage children for ocular problems should be done at regular intervals. For this orphanage staff workers should be oriented and trained in identifying common eye problems among the children so that these children can be referred for prompt treatment. They should also impart awareness regarding ocular hygiene among children. In this manner the incidence of ocular morbidity and blindness among the orphan children will be truly minimized.

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Original Article

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Awareness of Eye Donation in the Rural Population of North Karnataka

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Abstract

Purpose: To determine the "awareness of eye donation" and "willingness to donate eyes" in the rural population of North karnataka.

Methods: A total of 300 subjects representative of the rural population of north Karnataka participated. Subjects in age group of 18yrs to 70yrs were interviewed by a standard questionnaire regarding awareness of eye donation and willingness to donate eyes Oral consent was taken before interviewing the subjects.

Results: Out of 300 subjects, 19% were aware of eye donation, 81% were having no knowledge about eye donation. Out of those aware, 2% were females. Majority of those with knowledge about eye donation belonged to age group of 18 to 30 years (8%). Out of those with awareness 16% were literate and 3% were illiterate. The major source of awareness was media (11%) out of 300 subjects, 8% wanted to pledge their eyes, 12% were not interested, 64% needed more information about the procedure and 16% wanted to consult with relatives. 1% participants were aware that eye donation had to be done within 6 hours. Illiteracy and female sex were major predictors of ignorance. 16% were of opinion that there will be disfigurement after donating eyes .

Conclusion: Eventhough multiple strategies are currently followed to increase awareness of eye donations, more creative strategies have to be applied, especially to target rural, illiterate population.

Keywords: Eye Donation; Awareness; Rural Population; North Karnataka.

Introduction

Corneal blindness either due to corneal pathology like ulcers or trauma is a major cause of blindness and vision impairment in children and young adults, having a long life ahead of them [1].

The fact that restoring vision through corneal transplantation is possible for a sizeable proportion of the corneal blind in India has led to a sustained drive to raise awareness of eye donations and corneal transplant in general population, but the current annual procurement of corneas for donation in India remains at approximately one-tenth of the annual requirement (data from Eye Bank Association, India).

Navodaya Eye bank, Raichur is involved in promotional activities to increase awareness, besides harvesting donor eyes. A survey conducted to determine the level of awareness of eye donations in rural population of north Karnataka is reported here.

Materials and Methods

The study was conducted from Nov 2016 to March 2017. Subjects for this study were randomly selected from people attending Ophthalmology OPD, belonging to rural background.

300 no of subjects were interviewed using a standard questionnaire in their own local language

Subjects in age group of 18 to 70 yrs were interviewed. Oral consent was taken before the start of survey. Demographic details including age, gender, literacy were collected from the subjects.

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Literacy was defined as a minimum ability to read or write one's name. The time taken was approximately 8 to 10 minutes on an average.

Questions regarding awareness of eye donation, source of information, further willingness to pledge their eyes, myths about procedure of eye donation, awareness of eye banks in general were asked in the local language and data was compared based on age group, literacy status and gender.

Results

Table 1 shows the demographic characteristics of respondents to our study.

Out of 300 subjects, 66% were male 34% were female. 26% were literate 74% were illiterate. Results of questionnaire are as follows-

1. *Awareness of eye donation:* Only 19% of total subjects were aware of eye donation, 10% subject responded as just heard and 9% responded as yes. 81% of them had no knowledge (Table 2). Awareness in females was 2%, Out of those aware 16% were literate, and only 3% were illiterate (Table 2).
2. *Source of information about eye donation:* Out of various sources of information about eye donation, Media was a major source (11%). Other sources of information were through family doctor/hospital,village camps, posters in descending order.
3. *Willingness for eye donation:* After the subjects were informed about what eye donation is, 8%of subjects wanted to donate their eyes. Majority of subjects willing to donate eyes belonged to age group of 18 to 30yrs (6%) (Table 2). Out of total subjects who were ready to pledge their eyes, 5% (62.5%) were literate (Table 2).
4. *Knowledge of timing for eye donation:* Only 1% responded eye donation had to be done within 6 hours of death. 6% responded that it has to be done in 24hrs, Others were not aware of the timing.
5. *Reason for not pledging eyes:* Majority of subject not willing to pledge their eyes needed more information about the procedure to pledge their eyes (64%). 12% of them responded as they wanted to consult with their relatives (Chart 1).
6. *Opinion about delay in funeral:* 13% of subjects were of opinion that eye donation will cause delay in funeral, 85% had a doubt if eye donation can cause delay in funeral.
7. *Opinion about facial disfigurement:* 16% were of opinion that there wil be disfigurement after eye donation, 76% -(majority) were not sure.

Table 1: Demographic details

Age		**Percentage**
18-30 yrs	60	
31-50yrs	117	
51-70yrs	123	
Sex		
Male	198	66%
Female	102	34%
Literacy		
Illiterate	222	74%
Literate	78	26%
Primary Schooling	33	
Secondary Schooling	36	
Graduate		

Table 2:

		Do You Know About Eye Donation?				**Do You Want to Pledge Your Eyes?**		
		Yes	**No**	**Just Heard**	**Total**	**Yes**	**No**	**Total**
Gender	Male	24(8%)	147	27(9%)	198	21(7%)	177	198
	Female	3(1%)	96	3(1%)	102	3(1%)	99	102
Age	18-30yr	18(6%)	21	21(7%)	60	18(6%)	42	60
	31-50Yr	6	105	6	117	6	111	117
	>50yr	3	117	3	123	0	123	123
Literacy	Literate	21(7)%	30	27(9)%	78	15(5)%	63	78
	Illiterate	6	213	3	222	9	213	222

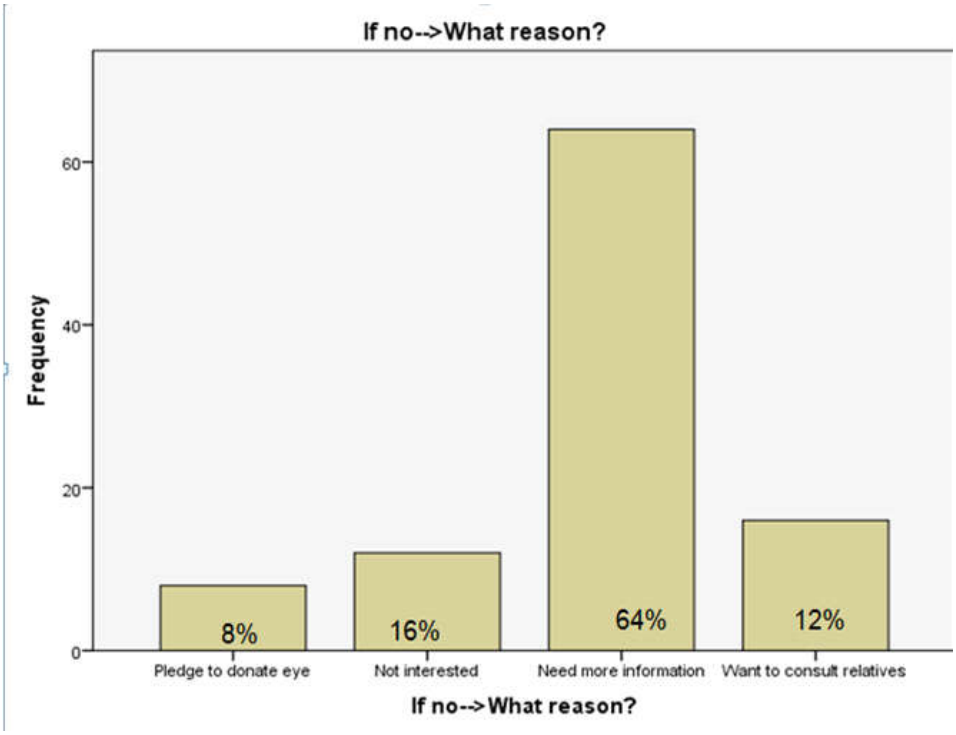

Chart 1: Bar chart Reason for not pledging eyes

Questionnaire

Personal Details

- name :
- age :
- address (Rural/Urban) :
- Occupation :
- Literacy : Literate/
- education :

Questions about Eye donation

1. Do you know about eye donation?
2. How did you come to know about eye donation?
3. What part of eye is donated in eye donation?
4. What is donated eye used for?
5. Who are eligible for eye donation?
6. Are there any religions taboos for eye donation?
7. Do you think there will be disfigurement of person after eye donation?
8. Do you feel there will be delay in funeral arrangement due to eye donation?
9. Are you willing to pledge you eyes for donation?
10. It no- what is the reason?
11. Has any relative of your pledged his/her eye?
12. Do you know about eye bank?
13. Do you know timing and function of eye bank?
14. If any relative of your s has pledged eyes? Haw early you should inform an eye bank?
15. Is there any fee for eye donation?
16. Do you know why eye donation is important?

8. *Awareness about eye bank*: Only 1.5% of subjects were aware about eye bank and its functioning.
9. *Religious Taboos:* Majority of subjects (95%) were of opinion that there are no religious taboos linked to eye donation.

Discussion

Corneal ulcers have been recognised as a major cause of blindness in developing countries [2]. major portion of the huge burden of blindness in India is avoidable [3,4]. The epidemiology of corneal blindness is dependent on endemic diseases prevalent in each geographical area [5].

Recent study from Karnataka, southern India reported the prevalence of corneal blindness as 0.13%. This constituted 9% of all blindness reported in this study [6]. The annual incidence of corneal ulcers in Madurai, Tamil Nadu is estimated at 113 per 100,000 people, which is 10 times the incidence reported from the United States [8].

Although the Madurai study cannot be considered representative of the entire country, a rough estimate of the magnitude of corneal ulcers in India may be obtained by projecting the results to the population of India. This will amount to approximately 840,000 persons developing a corneal ulcer every year in India; this is 30 times the number of corneal ulcers seen in the United States [9].

Corneal transplantation offers the potential for sight restoration to those who are blind from corneal diseases. This, however, is dependent on people willing to pledge their eyes, and relatives willing to honour their pledge.

Data from our study suggests additional efforts are needed to improve awareness of eye donation in the community. It is a matter of concern that only 19% of the persons interviewed had knowledge of eye donation. Illiteracy and female sex were possible predictors of ignorance of eye donation (Table 2).

A similar result was found in a preliminary survey conducted by the Aravind Eye Care System in an adult population of the state of Tamil Nadu in southern India [7], Females were less willing to pledge eyes.

In a similar study by Krishnaiah et al [8] *a*ge-gender adjusted prevalence of awareness of eye donation in rural population of andhra pradesh, was 30.7% but only 0.1% had pledged eyes. 32.9% were willing to pledge eyes. Among the subjects willing, to pledge their eyes for donation 91.2% were literates.

In our study, among the subjects who wanted to pledge their eyes, 62.5% were literates.

Therefore a novel method for awareness should be directed towards rural illiterate population for increasing the number of eye donations.

Priyadarshin et al [7] in their study also suggests that alternate strategies have to be developed for awareness of the illiterate and rural population.

Rural influential people like local leaders and religious priest can play a major role in increasing awareness in rural population. According to gogate et al [9] religious leaders have a tremendous potential to enhance eye donation.

General practitioner of medicine, medical and para medical student can also play an important role in clarifying doubts of subjects who need more knowledge about eye donation for pledging their eyes [12].

In a study conducted by Vallinayagam et al [10], on eye donation awareness in medical and engineering students, The majority of the population, 71.87% was not familiar with the enucleation time limit. Therefore educating medical and paramedical personnels about eye donation is of utmost importance .

Conclusion

Multiple strategies are currently followed for awareness about eye donation, But more creative and approachable strategies have to be applied. Especially to target rural, illiterate population which comprises of major bulk of people in our country

Steps should be Taken to -

1. Involve local leaders and religious priests.
2. Thorough education about procedure of eye donation and eye banking to medical practitioners and students.
3. Subjects who are willing to pledge their eyes but need more information should be targetted utmost.
4. Relatives of the deceased person should be motivated.

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Original Article

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Incidence and Outcome of Bilateral Rhegmatogenous Retinal Detachment in a Tertiary Eye Hospital in South India: A Retrospective Study

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Abstract

Background: Advanced stages of retinal detachment may cause blindness, hence a need for early diagnosis and treatment is recommended.

Aim of Study: To find out the incidence, risk factors and outcome of patients with bilateral rhegmatogenous retinal detachment reported at a tertiary referral hospital in Hyderabad, India.

Material and Methods: We carried out a retrospective study by recording the data of patients from medical records of Vitreo-Retina Department, Sarojini Devi Eye Hospital, Hyderabad, India, operated between June 2015 to June 2016. Details of history and ophthalmological findings by slit lamp examination, indirect ophthalmoscopy, colour retina charting, B Scan were recorded and were compared with earlier similar studies.

Results: The age of the patients ranged between 21 to 76 years, with a mean age of 27.5 years. Out of 250 patients, most of the patients (80%) were myopic and 20 (8%) presented with bilateral RD. Risk factor in most of the patients was myopia. We found that patients with fresh retinal detachment were managed with scleral buckling procedure. Patients with proliferative vitreoretinopathy changes were managed with pars plana vitrectomy with encircling band and silicone oil tamponade. When outcome after treatments were recorded, it was found that patients who reported without delay had good visual and anatomical outcome i.e. more than 80% of patients had good prognosis.

Conclusion: We found less incidence of bilateral rhegmatogenous retinal detachment in our study when compared to the literature. Myopia, post cataract surgery were few risk factors observed in our study. hence regular follow-ups are suggested to prevent blindness in these patients.

Keywords: Horse Shoe Tear; Myopia; Proliferative Vitreoretinopathy; Pseudophakia; Rhegmatogenous Retinal Detachment.

Introduction

The 12.7% cases of blindness in developing countries like India, were due to retinal diseases, making it as one of the commonest cause of blindness [1]. Retinal detachment (RD) is the disconnection of neurosensory retina from retinal pigment epithelium.

Majority of RD cases are usually preceded by posterior vitreous detachment (PVD) that causes traction on retina resulting in retinal tear, which causes seeping of liquefied vitreous thereby causing RD. Patients with advanced stages of RD may result in visual loss, thus necessitating early diagnosis and treatment [1,2]. However, very few studies have been carried out about the RD in India especially in Southern India.

RD even though rarely seen bilaterally may occur either concurrently or later. Studies have shown the report of bilateral RD in young myopic male patients. It is also reported in patients who underwent refractive surgeries like lasik for rectification of myopia, with an incidence of 0.033 to 0.25%.

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During lasik procedure, suction ring application might induce vitreous traction and detachment owing to rapid decompression of the eye, more usually seen in the infero temporal quadrant [3,4].

Literature has shown an incidence of 10 to 20% of bilateral RD cases in hospital based studies. This variation might be due to the criteria of patient selection and duration of the study [2-5]. We carried out a study to find out the incidence, risk factors and outcome of patients with bilateral RRD reported at a tertiary referral hospital in Hyderabad.

Material and Methods

A retrospective study was done by collecting all the data of 250 patients who presented to vitreo-retina dept, Sarojini Devi Eye Hospital operated between June 2015 to June 2016, from the medical records. After obtaining institutional ethical committee approval, the data was recorded. A detailed history, systemic and ophthalmology examination in the form of best corrected visual acuity, anterior segment examination, fundus examination and retina charting was carried out on all the patients. Demographic data, lens status, in pseudophakics posterior capsule integrity, any vitreous disturbance, configuration of RD in both eyes, location, size, number and shapes of breaks, degenerative changes like lattice degeneration with holes, PVR changes and any associated choroidal detachment (CD) were noted.

All the details were entered on microsoft excel sheets and descriptive statistical analysis was carried out regarding demographic details, clinical features, risk factors and outcomes.

Results

Demographic Data

We found that all the patients (100%) to be male. The patients age ranged between 21 to 76 years, with a mean age of 27.5 years. Out of 250 patients, most of the patients 200 (80%) were myopic and 20 (8%) presented with bilateral RD. All patients were from south India, except one patient was from north India settled in Telangana. The commonest symptom in about 90% of patients was vision loss. 205 patients (82%) came to the department within one month of onset of symptoms, whereas remaining 45 (18%) came after one month of symptoms.

Configuration of RD

Most of our patients presented with total rhegmatogenous retinal detachment (RRD). One young myopic patient presented with old inferior subtotal retinal detachment, demarcation line and sub retinal bands in right eye (RE) (Figure 1) and in left eye (LE) fresh subtotal retinal detachment with horse shoe tear (HST) in superotemporal quadrant. Patient noticed visual loss when LE developed RD.

One young adult myopic patient presented with radial GRT (Figure 2) in one eye and other eye had multiple lattice degeneration with multiple holes.

One middle aged myopic patient showed retinal detachment in left eye with superotemporal horse shoe break. After two months he underwent uneventful cataract surgery for complicated cataract in RE. One month after cataract surgery he developed consecutive subtotal retinal detachment with opened lattice degeneration (Figure 3) in superotemporal quadrant.

Patients who presented with simultaneous RD had old retinal detachment with severe PVR changes, all these patients were pseudophakics or aphakics

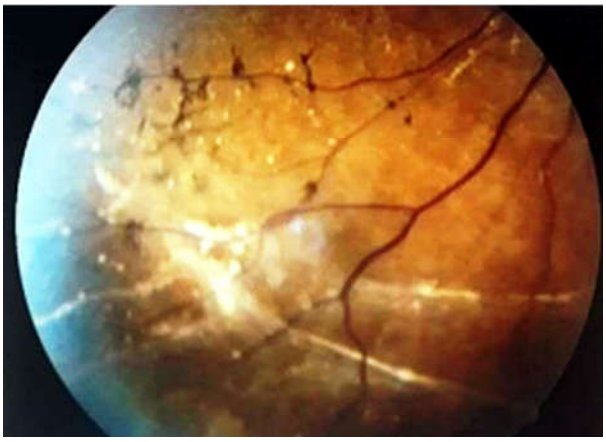

Fig. 1: Fundus image showing sub retinal bands and RPE degeneration

Fig. 2: Fundus image showing radial GRT

Fig. 3: Fundus image showing opened lattice in myopic patient

with fresh RD in other eye. These patients were one eyed when they came to our department, previously they ignored the problem, when they noticed visual loss in other eye then came for treatment.

Location and Types of Retinal Breaks

Most of the patients had horse shoe breaks in superotemporal quadrant, two of them presented with giant retinal tear (GRT), multiple lattice degeneration with multiple small holes noted in young adults, in few pseudophakics, breaks were not visible due to peripheral posterior capsular opacity. In some pseudophakics, primary break was not visible, may be in far periphery, not visible due to peripheral posterior capsule opacity. Some patients developed HST near the edge of the lattice degeneration (Figure 4).

Plan of Surgery based on Clinical Presentation

After examination, patients were explained regarding procedure and also the outcome of management. Phakics and pseudophakics with no vitreous disturbance and recent onset retinal detachment, RD, mild PVR changes underwent scleral buckling procedure. Pseudophakic patients with vitreous disturbance and moderate to severe PVR changes underwent parsplana vitrectomy (PPV) with silicone oil tamponade.

Surgical Procedures

Scleral buckling procedure (SBP) was done in patients who presented with recent onset RD, application of cryotherapy to break, placing 287 tyre to support the break with 240 band along the tyre

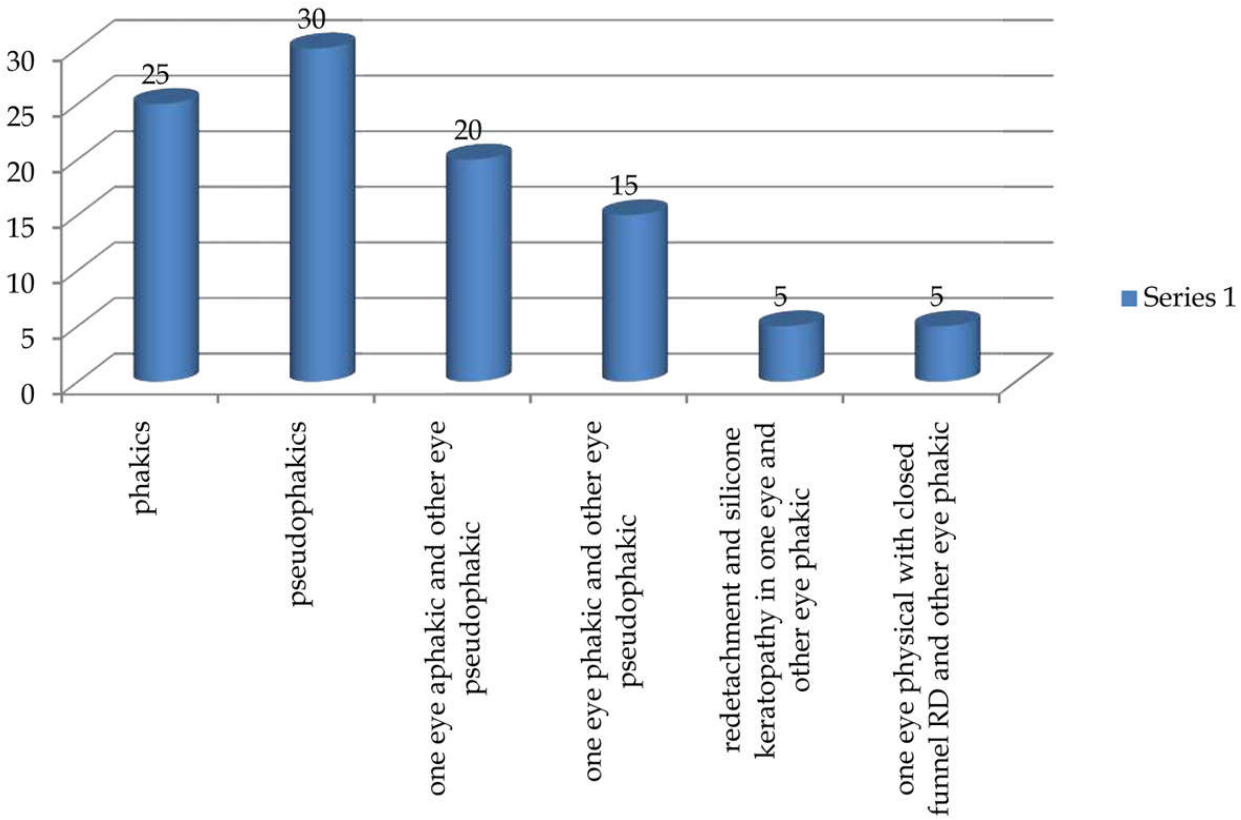

Fig. 4: Percentage of patients with lens status before surgery

and subretinal fluid drainage. Patients with PVR changes and patients where primary break not seen underwent vitrectomy procedure with encircling band and silicone oil tamponade.

Six patients (30%) underwent SBP in one eye and PPV with silicone oil tamponade in other eye. Five patients (25%) under PPV with silicone oil tamponade in both eyes. Four young patients (20%) with moderate to severe degree of myopia underwent SBP in both eyes. Two patients (10%) presented with inoperable RD in one eye and other eye fresh RD, these patients underwent PPV in one eye. Other eye prognosis was explained to patients. One 76 year old patient who had both eyes pseudophakic RRD underwent SBP in left eye, other eye breaks were not visible, disc was pale due to glaucomatous optic atrophy, infero temporal thickened fibrosed retina noted, prognosis was explained to patient. One 71 year old patient had pseudophakic RRD in both eyes with moderate PVR changes, patient was advised PPV. One 65 year old patient presented with pseudophakic RRD in one eye, other eye was blind eye. Pneumo retinopexy (PR) was done with cryo therapy and SF6 injection in single setting. After PR, vision was found to be improved to 6/24. Most of the patients had good anatomical and visual outcome (Figure 5).

All patients were treated based on the clinical presentation. Anatomically retina was attached in most of the patients, except two patients there was residual RD inferiorly, retina resisted to settle due to PVR changes. Posterior pole was on under silicone oil tamponade in these patients. No patient in our study required second procedure. All the patients

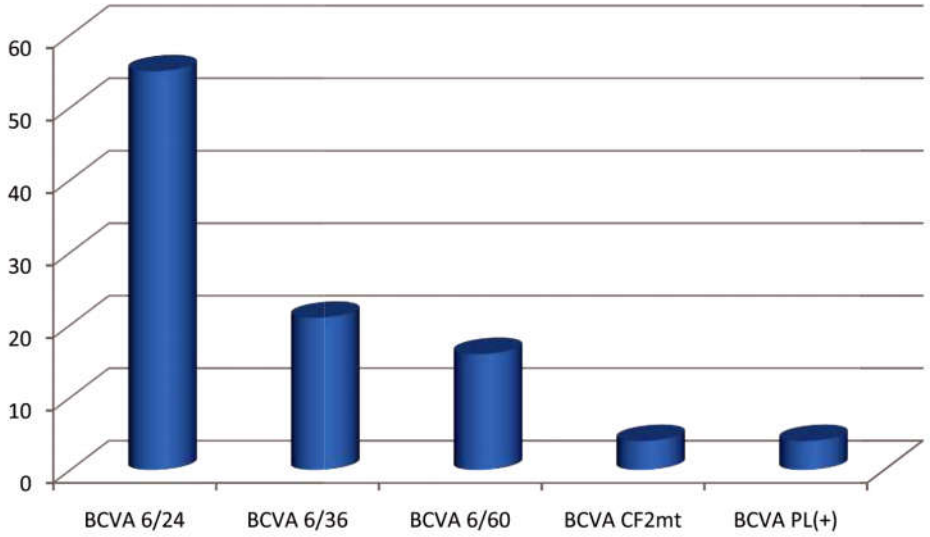

Fig. 5: Bar chart showing percentage of patients with BCVA after surgery

underwent 360 degrees barrage laser after surgery. Silicone oil removed in 4 patients, after 6 months, these patients had secondary glaucoma due to silicone oil in eye. Other patients with silicone oil in eye were frequently followed to detect any silicone oil related complications like keratopathy, cataract and secondary glaucoma.

Discussion

Patients with myopia usually have a risk of retinal tears and RD. In beginning retinal tears are spontaneous and asymptomatic. Later once retinal breaks advance to retinal detachment, loss of vision is seen in relation to the RD location [2-4].

In our study, out of 20 patients, one young myopic patient had radial GRT superiorly and remaining others had HST and lattice degeneration with multiple holes. The refractive error in the patients was between 2 to 3 dioptres in both eyes. The degree of myopia was moderate degree of myopia. 360 degrees prophylactic barrage laser was carried on young myopic patients. Even after prophylactic barrage laser, two patients developed RRD, which might be due to laser induced vitreous traction on retina resulting in opened lattice or retina tear [5-7].

Among all the risk factors, myopia was the major factor. This might be due early liquefaction of vitreous, PVD and vitreous retinal degenerations like lattice degenerations. In our study, we did not find any case of bilateral RD after Lasik procedure. Our findings

are similar to previous similar studies. Our study showed a low incidence of 8%, when compared to similar previous reports [4-6].

RD rarely affects both eyes simultaneously. Studies have shown incidence of simultaneous bilateral RRD to be 1.18 to 2.5% of all retinal detachments [3]. RD was seen in seven (35%) cases simultaneously. Out of which three young patients had old subtotal RD in one eye and the other eye with fresh RD. In other four patients, being old and with a history of cataract surgery in one eye or both eyes, they had chronic RD with severe PVR changes in one eye and other eye with fresh RD [2,3].

Trauma is one of a rare cause of bilateral RD. Literature search has revealed child abuse cases causing bilateral simultaneous RD. We did not find any case with a history of trauma or genetic factors in our study, myopia, higher age and post cataract surgery being risk factors [3,8,9].

Studies have shown the occurrence of RD in patients of all ages and in both the genders. All our patients were male, which might be due to the smaller sample size. Our patients were young adults to older ones. Usually RD is due to genetic causes in children and due to posterior vitreous detachment in adults [5-8].

As almost all the patients came to the department in early stage, the treatment outcome both anatomically and vision wise was good in our study. because all the patients presented in early stage so that they were managed properly. However in patients with delayed presentation, residual inferior RD was seen. Managing the patients who report in advanced stages, those with severe PVR changes, when RD is associated with choroidal detachment and in situations with thick peripheral posterior capsule, is difficult with poor prognosis. It is suggested that one should have knowledge about the features of retinal detachment, so as to plan treatment efficiently of this ocular emergency [8-10].

Limitations

1. Ours was a retrospective study
2. Hospital based study
3. Procedures were carried by multiple surgeons
4. Non inclusion of pediatric patients

Conclusion

To prevent retinal detachment, screening of myopic patients is imperative so as to avert visual loss. RD is seen in patients after cataract surgery mainly if there is vitreous disturbance, and also in myopic patients even in absence of any vitreous disturbance.

In patients with myopia, intervals between follow up visits must be short, in order not to miss any situation of RD. Early diagnosis and treatment will prevent loss of vision. We noticed that the patients who came early for examination had had good outcome both anatomically and functionally.

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