DOI: 10.14260/jemds/2014/2894

ORIGINAL ARTICLE

A PROSPECTIVE STUDY OF TRAUMATIC CATARACT AND ITS VISUAL OUTCOME

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HOW TO CITE THIS ARTICLE:
Siddharam S. Janti, A. M. Raja, C. Charanya, Adnan Matheen. "A Prospective Study of Traumatic Cataract and its Visual Outcome". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 26, June 30; Page: 7296-7303, DOI: 10.14260/jemds/2014/2894

ABSTRACT: INTRODUCTION: Ocular trauma is the leading cause of unilateral blindness all over the world.[1] The incidence of ocular trauma varies in different parts of the world. From India, the reported incidence is 20.53%.[2] Any strategy for prevention requires knowledge of the cause of injury, which may enable more appropriate targeting of resources towards preventing such injuries.[3] Eye trauma represents a large, potentially preventable burden on both victims and society as a whole. Traumatic cataracts occur secondary to blunt or penetrating ocular trauma, Infrared energy (glass-blower's cataract), electric shock and ionizing radiation are other rare causes of traumatic cataracts.[4] It form a separate category of cataracts as they present with other ocular morbidity like corneal tears, iris injury, vitreous hemorrhage and retinal tears; and they are to some extent, preventable. The methods used to evaluate the visual outcome in eyes managed for traumatic cataracts and senile cataracts are similar, but the damage to other ocular tissues owing to trauma may compromise the visual gain in eyes treated surgically for traumatic cataracts.[5] Hence, the success rates may differ between eyes with these two types of cataract. The aim of this study was to evaluate the final visual outcome of a patient with surgical extraction of traumatic cataract along with demographic features and modes of trauma.

KEYWORDS: Injury, trauma, corneal tear.

MATERIALS AND METHODS: This study was conducted in Regional Institute of Ophthalmology and Government Ophthalmic Hospital, Chennai from September 2007 to August 2009 for a period of 24 months. All patients presenting to the outpatient department with history of trauma and diminished vision due to cataract were included in the study. Patients with history of any pre existing posterior segment pathology and macular diseases were excluded. A detailed clinical history regarding diminution of vision, its mode of onset and duration, nature of trauma, associated ocular damage, time lapse between the occurrence of trauma and treatment were recorded. Complete ocular examinations were carried out.

This included visual acuity, anterior segment examination by slit lamp biomicroscopy, intraocular pressure measurement using applanation tonometry if cornea is clear without any tear or wound of entry, angle study by gonioscopy, posterior segment evaluation by direct and indirect ophthalmology, patency of nasolacrimal duct, X-ray orbit to rule out orbital fractures and IOFB, B-scan to find out the posterior segment pathology and the intactness of posterior capsule of the lens and Biometry for IOL power calculation. The slit lamp examination revealed the details of corneal tear, wound of entry, associated iridocyclitis and presence of cortex in the anterior chamber, iridodonesis, iridodialysis, any foreign body and the type of traumatic cataract.

In cases of traumatic cataract associated with wound of entry and iritis, topical and systemic antibiotics and steroids were given. Topical and systemic NSAIDS were given to relieve the pain. In

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cases of traumatic cataract associated with lens induced glaucoma (phacomorphic), the patients were started on systemic carbonic anhydrase inhibitors, topical steroids and beta blockers. If the tension is very high, I.V mannitol 20%, 200ml twice daily before surgery was given. The tension is brought under control and then the patient was taken up for surgery. The surgical procedure included adequate mydriasis was achieved with 1% cyclopentolate drops and 5% phenylephrine hydrochloride drops 2hrs before surgery. Systemic antibiotics were given 1 day preoperatively and on the day of surgery. Patients with history of inflammation due to trauma were taken under cover of steroids.

All the patients were operated under local anesthesia. The children and uncooperative patients were given general anesthesia. For a routine uncomplicated traumatic cataract (Traumatic Cataract with no zonular dehiscence, intact posterior capsule and normal lens position) small incision cataract surgery or phacoemulsification with PCIOL implantation was done as a primary procedure. Depending on the intactness of the posterior capsule and degree of zonular dehiscence, IOL as implanted with capsular tension segments or in the sulcus or in anterior chamber or with sclera fixation.

Certain patients presented with a corneal or corneoscleral tear with shallow anterior chamber and traumatic cataract. These patients were initially taken up for emergency suturing. Post operatively, antibiotics and steroids were given. After 6weeks, the patients were taken up for cataract surgery. Patients were examined everyday for first 4days, every week for six weeks. Spectacles correction was given at end of six weeks for the residual refractive error. The data processing was carried out on Statistical Package for Social Science (SPSS).

RESULTS: Out of 88 patients, 61(69%) male and 27 female (31%) patients. Increased incidence seen in males indicates relatively more involvement in outdoor activities and their nature of work should also be taken into account. Incidence of ocular trauma was more in the age group of 16-30 years (42%) which reflects the fact that other people in the active age group are more prone to sustain injuries. Traumatic cataract most common in farmers and industrial workers are involved due to the fact that they work outdoors in the fields. They are mostly exposed to stick and thorn. Trauma at industrial site occurs due to non wearing of protective glasses. In our study, Penetrating injury (60%) was more common than blunt injury (40%).

In the study, though the incidence of traumatic cataract was more in right eye (52%), there was no significant difference between the eyes involved. The common objects causing trauma were sticks (33%) and thorn (21%). Since this study was conducted in the general population and most of the patients belong to low socioeconomic status, the type of objects were stick and thorn.16 cases had no perception of light, 2 cases had defective projection of rays because of associated retinal detachment. Initial visual acuity of hand movement (or) worse was present in 48% patient.

The other associated ocular injuries include Self sealed corneal wound of entry in the form of opacity as seen in 25 cases (28%), 13 cases needed emergency corneal tear suturing (14%), 21 cases were self sealed corneal tears (24%). Out of 88 cases, 21 cases had shallow anterior chamber and 9 cases had irregular anterior chamber. Cortical matter extending out of lens capsule into the anterior chamber was seen in 6 cases and hyphaema in 5 cases.

19 patients had iritis which manifested in the form of altered iris pattern, flare and cells in anterior chamber, posterior synechiae, atrophic patches and iris pigment dispersion. Iridodialysis

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was seen in 6cases, Iris prolapse was seen in 5 cases, Iridodonesis was seen in 10 cases and Sphincter tear was seen in 8 cases. In the remaining cases, iris was normal. Subluxation of lens was present in 8 cases and 1 patient had anterior dislocation of lens into anterior chamber. Subconjunctival dislocation of lens was seen in 1 case. Intraocular pressure was raised in 12 patients in the traumatized eye.

The raised tension may be due to perforating injury with intumescent cataract, cortical matter in anterior chamber or iritis. These patients were treated medically with beta blockers and acetazolamide and later taken up for surgery. B scan was done in all patients. It showed 9 patients had posterior vitreous detachment (PVD), 8 had posterior capsule rupture, 2 patients had Retinal Detachment, 2 had Vitreous Hemorrhage. In all other cases ultrasound B-scan showed normal posterior segment. In our study, 52 patients had penetrating injury in which 13 had corneal or corneoscleral tear for which emergency corneal tear suturing with reformation of anterior chamber was done. These cases were taken up for secondary lens removed with or without IOL implantation after inflammation subsides. The remaining cases without corneal tear or with self- sealed corneal tear underwent primary procedure.

In our study, PCIOL was placed in 64% of cases; PCIOL with CTR was placed in 6% of cases, sulcus fixation IOL was placed in 9% of cases, sclera fixation IOL in 16% of cases, ACIOL in 2% of cases and 3% of cases left aphakic.

The most common intraoperative complications encountered were PC rupture (20%) (pre existing11% and intraoperative 9%) and vitreous disturbances (15%). Anterior vitrectomy was done in these patients with or without IOL implantation. 2 patients had nucleus drop for which pars planavitrectomy and lensectomy was done and patients were left aphakic. In this study the common early post operative complications include iritis (16%), striate keratitis (13%), pigment dispersion over IOL (9%), retained cortex (4%), hyphaema (3%) and shallow AC (2%). After 3 days of surgery, 39% patients had vision of 6/24 – 6/36, 38% patients had vision of <6/60 and only 23% had vision >6/18. Visual acuity during post-operative period as less than 6/36 in 77 cases due to early post operative complications like iritis (16%) and striate keratopathy (13%).

Post operatively at the end of 6 weeks, 24 cases had vision of 6/9 – 6/6, 44cases had vision of 6/18 – 6/12, 8 cases had vision of 6/36 – 6/24 and12 cases had vision of <6/60. Among 12 cases with poor vision, 8 cases had sutured corneal wound or corneal opacity in the visual axis, 2 cases had vitreous haze, 2 cases had retinal detachment, and 1 case had thick posterior capsular opacification which was not improved even after YAG capsulotomy.

DISCUSSION: This is a prospective study of 88cases of traumatic cataract managed at RIO- GOH chennai. The development of cataract is known complication following blunt or penetrating trauma to eye.[6] The incidence or traumatic cataract reflected in ophthalmic literature varies from 1% to 15% of all ocular injuries.[7] Age wise analysis showed that majority of cases occurred in younger age group (16-30). Zaman et al. stated that majority (50.64%) of the traumatic cataract patients are between 15-30 years.[8] This is because of the greater involvement in outdoor activity and recreational activity and work pattern of people. Most injuries resulted from woodenstick.[9]

Other studies also showed an increased incidence of traumatic cataract in younger age group. Daljit Singh showed similar age group distribution.[10] This study showed a male preponderance (69%). This is because men are more exposed to ocular trauma because of occupation and they are

from wage earning group. The study found that most of the cases 54% were caused by stick and thorns. This is because of the rural people who are working in fields.[11] Krishnamachary also found that 54.7% of injuries were caused by stick or bow and arrow. In this study penetrating trauma was common mode of injury 52(60%) cases. Blunt trauma was seen in 36 cases (40%). Daljit Singh et al (n=61) study showed 30 blunt trauma, 20 penetrating cases. Renusrinivasan study showed blunt trauma was common in traumatic cataract cases.

The patient presented to ophthalmic department varied from within one week to more than a year. six cases (7%)presented within one week. 21(24%) presented within one month. fifty five cases(62%) presented within one year. six cases (7%) presented more than one year. In his study, the duration between trauma and surgery did not much affect the visual outcome because none of the patients were in the amblyopia age group. The preoperative visual acuity in this series of study is as follows, 16(18%) of the eyes had PL and PR only. 26(30%) of eyes had perception of hand movements, 16 (18%) eyes had counting fingers at half meters. In the studies conducted by Renuka and Srinivasan et al and Krishnamachary M, the preoperative visual acuity was less than 6/60 to PL and PR in most of their cases.

Blum M reported 14.4% of secondary glaucoma associated with traumatic cataract. Marcus Blum noted Lens matter in anterior chamber associated with uvetiesin 4%of cases. The visual prognosis in traumatic cataract is poor because of concomitant injury to other structures.[12] The management of traumatic cataract depends on integrity of posterior capsule, zonular apparatus and associated injury to cornea, uveal tissue and posterior segment.[13] In this study the associated damages were corneal injuries in the form of scar or opacity seen in 52 cases (59%), corneal scarring and opacity affected the visual acuity by obstructing the visuals axis and causing astigmatism. Injury to the iris was seen in 17 cases (19%) in the form of traumatic mydriasis, iris prolapsed through corneal tear, iridodialysis, iris hole and adherent leukoma. The iris related complication did not affect the visual prognosis. Out of 88 cases which were followed up for one and half months, in 68 cases (77.27%) final visual outcome was 6/18 and above and in 15 cases (17.04%). Final visual outcome was between 6/18-3/60.

The main cause for the impaired vision in this study was due to corneal scars and opacity obstructing the visual axis and causing irregular astigmatism. In 5 cases visual acuity was less than 3/60. In two cases patient had developed a retinal detachment which was secondary to the traumatic vitreous hemorrhage, patient underwent retinal detachment surgery but there was no much improvement in vision. In the other case patient had a limbus to limbus total corneal scar, thus his vision remained poor. Gagandeep S noted excellent visual results 86%.[14] Marcus Blum reported good visual outcome of 90%.[15] This study of 88 cases of traumatic cataract almost all of which were managed by cataract extraction with IOL implantation showed good visual outcome, as shown by other studies.[16]

CONCLUSION: In conclusion, in our study males were predominantly affected by traumatic cataract keeping in view the nature of work and outdoor occupation. The age group of 16-30 years formed the core group of people to get traumatic cataract.

Though PCIOL implantation was the most common type of surgery used in our study, newer surgical techniques like PCIOL with capsular tension rings and sclera fixation IOL were done in complicated cases like zonular dehiscence and/or posterior capsular rupture. But however the final

visual outcome depends upon the extent of corneal injury and the posterior segment involved. More emphasis should be laid on the preventive measures by educating people on ocular trauma and timely management.[17]

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Age Group (yrs)	No of cases	Percentage
0-15	15	17%
16-30	38	42%
31-45	26	28%
46-60	9	10%
61-75	2	2%
76-90	1	1%

AGE DISTRIBUTION

TYPES	PERCENTAGE
Wooden Stick	33
Thorn	21
Metal piece	12
Stone	11
Fist	4
Ball	4
Metal wire	3
Glass piece	2
Pencil	3
Knife	2
Top	2
Plastic material	1
Bag	1
Needle	1

TYPES OF OBJECT

VISUAL ACUITY	NO OF CASES
PL	16
HM	26
CFCF	15
<6/60	27
6/36 – 6/24	3
6/18 – 6/12	1

VISUAL ACUITY AT PRSENTATION

Associated injuries	No. of cases
Cornel injury	52
Iris injury	17
Subluxated lens	8
Anterior dislocation of lens	1

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Subconjunctival dislocation of lens	1
Secondary glaucoma	12
Posterior synechiae	4
Retinal detachment	2
Vitreous hemorrhage	2

ASSOCIATED OCULAR INJURIES

DURATION BETWEEN INJURY & SURGERY	NO OF CASES
0 – 1 week	6
1 week – 1 month	21
1 month – 6 months	44
6 month – 1 year	11
>1 Year	6

TIME INTERVAL BETWEEN INJURY AND SURGICAL INTERVENTION

FINDINGS	NO OF PATIENTS
PCIOL	58
PCIOL WITH CTR	6
SULCUS FIXATION IOL	8
SCLERAL FIXATION IOL	12
ACIOL	2
APHAKIA	2

TYPES OF SURGERY

Intra operative complications	No of cases
Vitreous disturbances	16
Pre existing PC rupture	09
PC rent	7
Inadequate mydriasis	5
Positive vitreous pressure	2
Nucleus drop	1

Intra operative complications

V/A after 6 weeks post op (BCVA)	No. of cases
6/9 – 6/6	24
6/18 – 6/12	44
6/36 – 6/24	08
3/60 – 6/60	7
<3/60	5

VISUAL OUTCOME: AFTER 6 WEEKS POST-OP

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Date of Submission: 16/06/2014.
Date of Peer Review: 17/06/2014.
Date of Acceptance: 24/06/2014.
Date of Publishing: 30/06/2014.