SOCIO-DEMOGRAPHIC PROFILE OF TRAUMATIC CATARACT IN WESTERN ODISHA: A STUDY AT A TERTIARY CARE HOSPITAL

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ABSTRACT

AIM

Ocular injuries are common in all age groups, be it from blunt trauma like cricket ball, bat, etc or penetrating injury from pen, pencil or stick with cataract being the most common complication. Other complications like corneal perforation with or without iris prolapse, total hyphema, lens subluxation with or without posterior capsular rupture, iridodialysis, uveitis, vitreous haemorrhage, retinal detachment, etc. may occur. The aim of the study was to find out the various causes of traumatic cataract and associated socio-demographic profile in western Odisha, in a single tertiary care centre.

MATERIALS AND METHODS

Retrospective study was conducted on 76 patients who had traumatic cataract and were admitted to VSS Institute of Medical Sciences and Research (VIMSAR), Burla, Odisha from March 2014 to March 2016, a total period of 2 years. Data related to the type of injury, duration of presentation, age, sex, occupation and initial visual acuity were taken. B-scans were done for all cases. X-ray and CT scans were done wherever required.

RESULTS

Traumatic injuries were most common in children and young adults. 27 cases (35.52%) were children in age group less than 10 years. The incidences decreased with increase in age and were less frequent in the elderly. The most common form of injury was penetrating injury with stick injury as the cause in 19 cases (25%), followed by pen (19.73%) and pencil (14.47%). Males were injured more frequently (63.15%) than females (36.84%). 59 patients presented within 24 hours of injury which comprised 77.63% in total. Though most had poor visual acuity at initial presentation, postoperative prognosis was found to be good in general, if not associated with any other complications.

CONCLUSION

Since traumatic cataract is common in childhood, parents should be vigilant and should prohibit the use of sharp instruments in children. Occupational workers should use protective eye gears to avoid untoward incident. Though traumatic cataract is the most common complication of blunt or penetrating trauma, it has a rather good prognosis in terms of surgical and visual outcome.

KEYWORDS

Traumatic Cataract, Cataract, Trauma, Western Odisha, Ocular Injury.

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INTRODUCTION: Traumatic cataract occurs secondary to blunt trauma like stone, cricket ball, bat, etc., or from penetrating ocular trauma like pen, pencil or stick. The lens may show the presence of Vossius ring, concussion cataract, discrete subepithelial opacities, early rosette cataract, late rosette cataract or traumatic zonular cataract after a blunt injury. [1] Some of the rare causes of traumatic cataract could be ionising radiation, infrared energy (Also known as "glass blower's cataract") or electric shock.[2]

Everyone in their day-to-day activities are prone to trauma, be it a simple task of writing with a pen to playing outdoor sports. Even occupational activities like stone chipping or industrial work may lead to inadvertent ocular trauma. Following an ocular injury, cataract is the most common complication and is a major cause of morbidity. [3] Males and in particular people working outside are more susceptible to ocular traumas. Incidences of ocular injuries have been studied from time to time and from different geographic locations, in both rural as well as urban setting.[4],[5],[6] The aetiology of ocular injuries is likely to differ from place to place and is worthy of investigation. To

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our knowledge, no study on the aetiology of traumatic cataract has been done in western Odisha. This study aims to find out the socio-demographic profile of traumatic cataract and its causes in this particular geographic region.

MATERIALS AND METHODS: This was a retrospective study, which was conducted on 76 patients having traumatic cataract attending the OPD services of the Department of Ophthalmology at VSS Institute of Medical Sciences and Research (VIMSAR), Burla, Odisha between a period which extended from March 2014 to March 2016; a total duration of 2 years. The nature of injury, time since injury and presentation, age, sex, occupation and initial visual acuity were taken into consideration. Based on lenticular opacity, cataracts were classified into total, membranous, white soft, and rosette types. [7] Visual acuity was assessed by Snellen's chart. B-scans were done for all cases. X-ray and CT scans were done wherever required like suspected orbital wall fracture, optic nerve injury, extraocular muscle injury, scleral lacerations, to determine the presence and location of intraocular foreign body or to demonstrate the integrity of the globe. All the data were compiled and evaluated.

RESULTS: The majority of traumatic cataract patients were children or young adults and the frequency decreased with subsequent increase in age and were rare in the elderly. Children less than 10 years constituted 27(35.52%) of the cases while 21(27.63%) were in the age group 11-20 years. In total, 78.94% aged less than 30 years [Table 1]. Out of the 76 patients, 64(84.21%) had penetrating injury of some kind and rest had blunt trauma which had resulted in traumatic cataract. Stick injury was responsible for majority of penetrating injury comprising about 19(25%) cases, followed by pen in 15(19.73%) and pencil in 11(14.47%) of total cases [Table 2]. Some of the rarer causes of penetrating injury like screw driver, industrial machinery parts, shot gun injury, etc. were also noticed. Males were more likely to get injured than females. The male-to-female ratio in cases of ocular trauma is 4:1. In our study, 54 (71.05%) were males compared to only 22 (28.94%) females [Table 3]. This closely resembles to the data found by Shah et al.[8] The likely reason could be because of the involvement of male counterparts more in outdoor work. The majority of patients, 59(77.63%), presented within 24 hours of infliction of injury while only 5(6.57%) presented after 48 hours. This shows the public awareness in general in this area regarding the adverse effects of ocular injuries [Table 4]. This is important as in many other studies it was noted that the duration of presentation to the clinic by the patient after injury ranged from days to weeks and even months. To add to it, the visual outcome is better if presented early. Occupation wise farmers or agricultural workers were most likely to get injured and comprised 35(46.05%) of total affected followed by students in 18(23.68%) and manual labourers in 12(15.78%) cases [Table 5]. We found that most of these agricultural workers and manual labourers were young and had suffered penetrating ocular injury while working in the fields or outdoors, mostly with stick. Since people start working at a younger age group in this geographic region to support their family, with farming as the primary occupation, these groups should be made aware of the hazards of ocular injuries and in particular its prevention while working in the fields. Majority of the patients had poor visual acuity at presentation. 38 patients (50%) were perception of light and projection of rays positive while only 5 (6.57%) had visual acuity 6/6 or better [Table 6]. Though the visual acuity of majority at initial presentation was poor, the postoperative surgical outcome was good if not associated with complications like vitreous haemorrhage, retinal detachment, etc.

Age Group (In years)	Number of Cases (n)	Percentage (%) [n/Total No. of Cases)
0-10	27	35.52%
11-20	21	27.63%
21-30	12	15.78%
31-40	8	10.52%
More than 41	8	10.52%

Table 1: Age Group Wise Distribution

Objects Causing Injury	Number of Cases (n)	Percentage (%) (of total traumatic cataract cases)
Pen	15	19.73%
Stick	19	25%
Pencil	11	14.47%
Thorn	3	3.94%
Nail	2	2.63%
Screw driver	1	1.31%
Needle	2	2.63%
Pin	2	2.63%
Fork	1	1.31%
Industrial machinery parts	1	1.31%
Scissor	1	1.31%
Wire	2	2.63%
Glass piece	2	2.63%
Bird beak	1	1.31%
Shot gun injury	1	1.31%
	Total 64	

Table 2: Objects Causing Penetrating Injury

	Male [n(%)]	Female [n(%)]	
Penetrating injury	45(59.21%)	19(25%)	Total: 64
Blunt trauma	9(11.84%)	3(3.94%)	Total: 12
	Total: 54(71.05%)	Total: 22(28.94%)	

Table 3: Gender Wise Distribution

Duration (In hours)	Number of Cases [n (%)]
<24 hours	59(77.63%)
24-48 hours	12(15.78%)
>48 hours	5(6.57%)

Table 4: Duration Of Presentation

Occupation	Number of Cases (n)	Percentage (%)
Farmer/agricultural worker	35	46.05%
Student	18	23.68%
Manual labourer	12	15.78%
Stone cutter	5	6.57%
Unemployed	5	6.57%
Industrial worker	1	1.31%

Table 5: Distribution According to Occupation

Visual Acuity at Initial Presentation	Number of Cases (Percentage %)
6/60 and better	5(6.57%)
Hand movement to 6/60	24(31.57%)
PL and PR positive	38(50%)
PL negative	9(11.84%)
	Total: 76

Table 6: Visual Prognosis

DISCUSSION: Cataractous change of natural crystalline lens is a known complication after penetrating or blunt ocular trauma occurring in around 1-15% of all cases. [9] It remains a significant cause of visual impairment and physical disability among both adults and children. Other associated complications like corneal perforation with or without iris prolapse, total hyphema (referred also as "blackball" or "8 ball hyphema"), lens subluxation with or without posterior capsular rupture, iridodialysis, zonular disruption, phacodonesis, uveitis, phacolytic/phacomorphic/pupillary block glaucoma, vitreous haemorrhage, retinal detachment, commotio retinae, choroidal rupture, etc., may occur. Cataracts caused by blunt trauma classically form stellate or rosette shaped posterior axial opacities that may be stable or progressive, whereas penetrating trauma with disruption of the lens capsule forms cortical changes that may remain focal if small or may progress rapidly to total cortical opacification. Blunt trauma is responsible for coup and contrecoup ocular injury. Coup is the mechanism of direct impact. It is responsible for Vossius ring (which is the imprinted iris pigment) found on the anterior lens capsule following blunt injury. Contrecoup refers to a distant injury (indirect injury) caused by shockwaves traveling along the line of concussion.[7] When there is a blunt impact on the eye, there is a rapid anterior-posterior shortening of the globe accompanied by equatorial expansion. This equatorial stretching can result in disruption of the lens capsule, zonules, or both. Combination of coup, contrecoup, and equatorial expansion is responsible for formation of traumatic cataract following blunt ocular injury.[10],[11],[12] Sethi et al., reported in their study that most of the patients affected were young and majority of them i.e. about half were children. [13] In our study also young adults and children were affected the most with decreased prevalence in the elderly. Traumatic cataract can occur in any age group or gender. It is associated with various ocular injuries, which may be divided into penetrating and blunt injuries. Daljit Singh et al., in their study reported that half of the trauma cases sustained penetrating injuries [14] though it was higher in our study comprising about ~84%. Male preponderance was found. It can be due to involvement of males in sports, outdoor activities and occupational work more than females. In our study, the young adults engaged in agricultural work were more likely injured while working in the fields or outdoors. Srivastava et al., also found that males were comparatively more affected.[15] Other studies have also proved same findings.[16],[17],[18],[19] Tewari et al., and Krishnan et al., reported stick as the most commonest agent for injury to the eyes[20],[21] which was about 25% of all cases in our study, followed by pencil and pen; which were 14.47% and 19.73% respectively. In a study conducted in Yemen involving a small sample of traumatic cataracts and intraocular foreign bodies (IOFBs), Aldakaf et al. found that the initial visual acuity and mechanism of injury were predictors of the final visual outcome.[22] In general, the visual prognosis was considered to be good. B-scan is an important modality for estimation of lens and posterior segment status in traumatic cataract cases[23],[24] and should be done in all cases of injury to rule out any associated posterior segment complications like vitreous haemorrhage, retinal detachment, lens subluxation, choroidal rupture, etc. Along with it, other imaging modalities like CT scans or X-ray can be done to rule out the presence of any retained intraocular foreign body and its location, orbital emphysema, associated fracture of orbital walls or zygoma or to assess the integrity of the globe. MRI should be absolutely contraindicated in case of suspected metallic foreign bodies.

LIMITATION: The main limitation of this study was the small sample size and the conduct of the study in a single tertiary healthcare centre, which though gives a fair idea about the local socio-demographic conditions, but cannot be generalised.

CONCLUSION: Ocular traumatic injury followed by the subsequent development of traumatic cataract though common, can be prevented by wearing protective eye gears and careful use of sharp objects. Use of common everyday sharp objects like pen, pencil, needle or scissors in infants and toddlers should be prevented. Occupational workers should use protective eye gears while working in the fields and for industrial workers it should be made compulsory. Needless to say, an early presentation will have a good surgical management and better visual outcome.

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