



ORIGINAL RESEARCH PAPER

Ophthalmology

CLINICAL STUDY AND FACTORS AFFECTING THE VISUAL PROGNOSIS IN TRAUMATIC CATARACT PATIENTS.

KEY WORDS: Traumatic cataract, visual prognosis, cataract surgery.

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ABSTRACT

Purpose: The aim of this study is to describe the sociodemographics and various factors affecting the visual prognosis in traumatic cataract. **Methods and Material:** This is prospective interventional study on 50 patients. Informed consent obtained from all patients. Information on biodata, detailed history, preoperative findings, details of surgery, postoperative findings are documented. The functional outcomes were assessed based on postoperative best corrected visual acuity (BCVA). **Results:** Incidence of ocular trauma was more in aged <40 years (72%). Out of 50 patients 40 (80%) male and 10 (20%) female patients. Increased incidence seen in males indicates relatively more involvement in outdoor activities and their nature of work. Penetrating injury was most common than blunt trauma. Total cataract (46%) was most common. Open globe injury caused total cataract ($p < 0.029$). Vision at presentation PL-1/60 (60%). Time lag between injury and surgery was 1 week-1 month ($p < 0.001$). All patients underwent cataract extraction with IOL implantation and wound repair was done wherever it was necessary. Final Visual Acuity was 6/6-6/36 in 42% of patients, 36% patients attained a final visual acuity of 6/60-3/60 and visual acuity of less than 3/60 was seen in 22% patients. Open globe injury caused less vision due to corneal opacity in visual axis and astigmatism. **Conclusions:** Cataract surgery with intraocular lens implantation is highly effective in restoring vision in traumatic cataract patients. The time lag between injury and surgery should be as short as possible for complete recovery. The type of trauma, extent of lenticular involvement, associated damage to ocular structure are determining the ultimate visual prognosis. With improved technology and increasing popularization of IOL, the problem of binocular vision will be solved and thus we can prevent the traumatic eye from being amblyopic. More importance should be given to the preventive measures by educating people on ocular trauma and timely management.

INTRODUCTION

Ocular trauma is one of the major cause of monocular visual impairment and blindness in all part of the world. Eye injuries occur in approximately one-fifth of adults, with men and young people being the most commonly affected⁽¹⁾. About 1.6 million people lose sight yearly due to traumatic cataract⁽²⁾. The results of traumatic cataract treatment is very successful in cases in which there is no optic nerve, retina, or macular injury or if the injury is mild⁽³⁾. Although the circumstances of injury often appear fortuitous, a high proportion of all trauma is predictable and hence avoidable, clearly much depends on the awareness of risk and the use of appropriate safety measures⁽⁴⁾. Most ocular injuries in rural population occurred at workplace suggesting the need to explore workplace strategies to minimize ocular trauma as a priority⁽⁵⁾. Since traumatic cataract causes significant visual impairment, it is necessary to evaluate the damages caused by it and manage it with timely intervention to restore the vision at the earliest.

Subjects and Methods:

It is a prospective interventional single centre study conducted in 50 patients with traumatic cataracts undergoing cataract surgery from November 2017-June 2019. Detailed clinical history was taken. Ocular examination done including BCVA, slit lamp examination, fundus examination noted. These patients were followed up post surgery on day 1, 1st week, 1 month, 6 month.

Our research has been approved by the Medical Ethical Committee of our university. The written or oral consent has been obtained from all participants or the guardians if the patient is minor.

The confidentiality of patients was maintained throughout at all stages of the data analysis.

Study Population

Patients with visually significant traumatic cataract were included.

Exclusion Criteria

1. All other types of cataract other than traumatic cataract such as:
 - Complicated cataract.
 - Congenital or developmental cataract.
 - Age related cataract.
 - Traumatic cataracts due to infrared radiation, electrical injury and chemical injury.
2. Ocular injuries without cataract.
3. Traumatic cataract with diagnosed pre-existing ocular disease.

Surgical Technique

Surgeries were done under peribulbar anaesthesia. Uncooperative patients and children were posted under general anaesthesia. Preferred procedures adopted was Manual Small Incision Cataract surgery (MSICS) with posterior chamber intraocular lens (PCIOL) and other surgical procedures were Phacoemulsification with PCIOL, Lens irrigation and aspiration (IA) with PCIOL. All patients were given topical antibiotic steroid combination eye drop and a short acting cycloplegic drop in the postoperative period. Systemic steroid was given wherever indicated. Follow up of all patients were done on first post-operative day, at one week, one month and six month. Best corrected visual acuity (BCVA) was recorded and spectacle correction was done wherever it was needed.

RESULTS

The study group consists of 50 cases of traumatic cataract. This study is based on age wise distribution of traumatic cataract, mode of injury, type of cataract, associated ocular injuries, associated complications, surgical complications and final visual outcome after cataract extraction with primary intraocular lens implantation. Majority of the cases were seen in the age group of 21-30 years (26%) with a Male predominance (80%). Penetrating injury in 38 cases (76%) followed by blunt trauma in 12 (24%) cases. Penetrating injury was seen more in people of rural area, working in fields. Stick and thorn were the major objects causing injury. The type of cataract seen was mainly total cataract in 86% cases. Associated ocular injuries were mainly corneal injuries

(80%) and iris injuries (30%). Lens extraction and IOL implantation was done. Intraoperatively vitreous loss was seen in 6% of the cases. Post-operative complications seen were uveitis, striate keratopathy, shallow anterior chamber and hyphaema. Majority of the eyes gained good vision post-operatively (78%) (p value-0.041). Corneal scarring obstructing the visual axis as well as by inducing irregular astigmatism formed an important cause of poor visual outcome in significant number of cases (p value-0.026).

DISCUSSION

People are subjected to accidental trauma in various ways, and this may happen to any individual at any age, young people seem to be more vulnerable. Ocular trauma often leads to traumatic cataract along with damage to other ocular structures⁽⁶⁾. As Kuhn reported, traumatic cataract management is an individualized, consciously made decision regarding what to do and when and how to do it to achieve the best possible outcomes⁽⁷⁾. With improvement in technology and intraocular lenses, one can achieve good vision in cases of traumatic cataract by extraction of cataractous lens and primary implantation of intraocular lens⁽⁸⁾.

The prevalence of cataract formation after ocular trauma is approximately 65%⁽¹⁾. Eye injuries occur in approximately one-fifth of adults, with men and young people being the most commonly affected^(9,10).

The type of trauma, extent of lenticular damage, associated damage to other ocular structures determines the ultimate visual prognosis⁽¹¹⁾.

Age Wise Distribution

Age wise analysis showed that majority of cases occurred in younger age group (21-30 years). Toh ZH et al study showed similar age group distribution⁽⁴⁾. This is because of the greater involvement in outdoor activity, sports and work pattern of the people studied.

Type of Trauma:

The relative frequency of penetrating trauma was common mode of injury i.e., 38 cases (76%) and blunt trauma accounted to 12 cases (24%). It was because most patients are from rural population working in fields.

Object Causing Injury:

The study found that most of the cases i.e., 22 (44%) were caused by stick, 12 were caused by thorn. This is because of the rural people who are working in fields. 11 cases (22%) were due to stone particles, whereas 3 cases were due to glass piece, 2 were due to tyre. Toh ZH et al⁽⁴⁾ also found that most of the injuries i.e., 54.7% were caused by stick or bow and arrow.

Duration Between Trauma and Surgery

It varied from within one week to more than a year. 11 cases (22%) presented within a week. 19 (38%) presented within a month, 14 (28%) presented within one year and 6 (12%) presented after more than a year from injury.

Preoperative Visual Acuity

The preoperative visual acuity in this series of study is as follows, 4 (8%) of the eyes had PL and PR only. 23 (46%) of eyes had perception of HM, 13 (26%) eyes had CF and 10 (20%) 1/60-3/60. Studies conducted by Toh Z H et al^(4,5), the preoperative visual acuity was less than 6/60 to PL and PR in most of their cases. The preoperative visual acuity of the other eye was recorded and it was in the range of 6/6 to 6/12 on the Snellen's chart. This is very important for the development of binocular single vision following surgery to the injured eye.

Table 1. Demographic Characteristics Of The Study Population.

	No of patients	Percentage
Male	40	80

Female	10	20
Age at evaluation		
<10years	14	12
11-20years	12	14
21-30years	20	26
31-40years	08	20
41-50years	04	12
51-60years	03	16
Type of injury		
Blunt trauma	12	24
Penetrating trauma	38	76
Time since injury		
Within week	11	22
Within month	19	18
Within year	14	28
>Year	06	12
Preoperative visual acuity		
PL/PR	04	08
HM	23	46
CFCF	13	26
1/60-3/60	10	20
Associated ocular injuries		
Injury to cornea	40	80
Injury to iris	14	28
Injury to lens	03	06
Final visual acuity		
6/6-6/18	15	30
<6/18-3/60	24	48
<3/60	11	22

Associated Damage to Other Ocular Structures

The visual prognosis in traumatic cataract is poor because of concomitant injury to other structures. The management of traumatic cataract depends on integrity of posterior capsule, zonular apparatus and associated injury to cornea, uveal tissue and posterior segment. In this study the associated damages were corneal injuries in the form of scar or opacity seen in 40 cases (80%), corneal scarring and opacity affected the visual acuity by obstructing the visual axis and causing astigmatism (p value-0.026). Other studies also give corneal damage as most common associated ocular injury in ocular trauma cases⁽¹³⁾. Injury to the iris was seen in 15 cases (30%) in the form of traumatic mydriasis, iris prolapsed through corneal tear, iridodialysis, iris hole. Lens subluxation seen in 3 (6%) cases.

Table 2- Correlation Between Corneal Involvement With Final Vision

Table 14 Correlation between corneal involvement with final vision				
Corneal involvement	Final vision			
	6/6-6/18	<6/18-3/60	<3/60	Total
Without corneal involvement	4(40%)	6(60%)	0(0%)	10(100%)
With corneal involvement	3(7.5%)	35(87.5%)	2(5%)	40(100%)
Total	7(14%)	41(82%)	2(4%)	50(100%)

Chi square-7.27, p value-0.026

Final Visual Acuity

Final visual acuity (best corrected visual acuity) was measured at the end of 6 months. Final visual acuity of 6/6-6/18 was achieved in 15 cases (30%), <6/18-3/60 in 24 cases (48%) and in 11 cases (22%) final visual acuity was <3/60. Improvement in the final visual acuity (p value-0.041)

Table 3: Correlation Between Preoperative Vision And Final Vision

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Preoperative vision	Final vision			
	6/6-6/18	<6/18-3/60	<3/60	Total
PL	1(25%)	1(25%)	2(50%)	4(100%)
HM	4(17.4%)	15(65.2%)	4(17.4%)	23(100%)
CF	5(38.5%)	4(30.8%)	4(30.8%)	13(100%)
1/60-3/60	5(50%)	4((40%)	1(10%)	10(100%)
Total	15(30%)	24(48%)	11(22%)	50(100%)
Chi-square 7.4,p value – 0.041				

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Conflicts of Interest: The Author(s) declare(s) that there are no conflicts of interest.

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