

Evaluation and Assessment of Manifestations of Ocular Injuries due to Road Traffic Accidents in Tertiary care centre, Bastar District of Chhattisgarh

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ABSTRACT

BACKGROUND AND AIM

To find out the manifestations of ocular injuries in automobile accidents in patients coming in ophthalmology department of GMC Jagdalpur.

INTRODUCTION

Ocular injury is an important public health problem affecting visual acuity as well as damaging the social and economic status of patients due to visual morbidity. This study aims to determine the demographics, clinical profile and manifestations of ocular trauma due to RTA.

METHODS

This study was conducted at Ophthalmology department of Lt. BRKM GMC, Jagdalpur. Cases presented to OPD, Emergency or hospitalized in ophthalmology department were included and detail examination and necessary intervention done.

RESULTS

The study was done among 150 patients. 82.7% males and 17.3% females were involved. 64% patients belonged to 21-40 years age group.

CONCLUSION

Male gender is more often involved in RTA because in our society they are more exposed to outdoor activities and travelling. Alcohol abuse and no use of seat belt, helmet were main causative factors. Complete loss of eyesight is visually and economically impairing for the patient.

KEYWORDS

RTA, Ocular injury, Visual morbidity

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INTRODUCTION

Ocular injury is a major cause of preventable blindness and visual impairment in India. It is the cause of blindness in more than half a million people worldwide and it is often the leading cause of unilateral loss of vision, particularly in developing countries [1]. Serious mechanical eye injuries are not uncommon [2]. It was estimated that the incidence of blindness due to eye injuries was 9/1,00,000 people in developed countries and 75/1,00,000 in developing countries [3]. According to the data from the ophthalmic literature and WHO's Blindness Data Bank, about 55 million eye injuries occurred that restricted activities more than one day each year and 7,50,000 cases required hospitalization, which included 2,00,000 open-globe injuries; In addition, approximately 1.6 million blindness resulted from trauma, and there were 2.3 million people with bilateral low vision in these causes, and almost 19 million with unilateral blindness or low vision [4]. In India the major contributors of eye injury are RTA (34%), sports (29%) and occupations (21%) [5,6]. The role of ocular injuries due to head trauma in the causation of blindness and overall prognosis of patients has become a subject of immense importance with RTAs being the most common risk factor [7]. Head injuries are frequently associated with ophthalmic manifestations and consequent visual morbidity [8,9]. The major risk factors for eye injuries include age, sex, socioeconomic status, lifestyle, and the site where the injuries occur, awareness about road safety norms [10]. The population increase results in increase in number of vehicles on the road leads to more RTA. Any type of injuries in RTA are mostly due to not following safety rules which include without helmet, without seat belt, with alcohol consumption and not obey driving rules [11,12].

Eye injuries in road accidents have received little attention as a cause of vision impairment and blindness to all age group despite being largely preventable with the proper use of eye protection. Eye injuries not only results in disability or loss of vision but creates enormous loss to both victim and society productivity. Many research works and studies have been conducted in different parts of Chhattisgarh state to understand the ocular injuries in RTA with type of ocular injuries and risk factor involved with impact on visual acuity [13-16]. But being a largest tribal area of Chhattisgarh, till now there was no report or studies published on clinical characteristics or risk factor analysis of ocular injuries in and around Bastar region. Hence this study is an attempt to evaluate and assess the aetiologies and patterns of ocular injuries due to RTA in Bastar district of Chhattisgarh state. This study will help the government and other NGO in planning to prevent the ocular injuries or trauma in this most backward area with respect to socio-economic level.

METHODOLOGY

Study Design

It was a hospital based descriptive observational study enrolling 150 patients who came to OPD of Ophthalmology department after ocular trauma secondarily to RTA. The study was conducted after approval from the Institutional Ethical Committee. Subjects were informed in detail regarding study.

All medicolegal cases were informed to police and written informed consent was taken.

Sample Size

Sample size was calculated as per the previous studies approximate 5-15% prevalence of ocular injuries in RTA in India. So 10% prevalence was taken. Sample size calculation formula for prevalence study is taken as

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where z is 1.96 for 95% confidence level, p= prevalence of particular disease which it is taken as 0.10, d is precision in study which is taken as 5%. So it is 0.05, and n is sample size which is calculated as 138.3. To nullify the biasness of any type and rejection we decided to take sample size 150.

Inclusion Criteria

- RTA causing ocular injury

Exclusion Criteria

- All domestic ocular injury
- All workplace ocular injury
- All pediatric ocular injury occurring while playing
- All Industrial injury

Detailed history of injury was taken and thorough general physical examination, systemic and ophthalmic examination conducted. The VA was examined at the time of presentation and discharge or on follow up irrespective of the type of treatment given or surgery done. This is done to analyse the severity of RTA.

RESULTS

Closed globe injury was found in 97.3% while open globe injury in 2.7% patients. Table 1 represents the age distribution of 150 patients admitted with the problem of ocular injuries. The mean age of studied patients is 31.8 years with standard deviation of 11.86 years. Figure 1 represents the gender distribution of patient of ocular injuries due to RTA. After completion of treatment, it was found that in right eye 1.3% patient had complete loss of vision i.e. no PL, while 95.3% patients had vision between 6/6 to 6/12 and rest 3.3% had vision between 6/18 to perception of light. In left eye 1.3% patient had no PL, 96.6% patients had vision between 6/6 to 6/12 and 2.1% patient had vision between 6/18 to perception of light.

Age group	Frequency	Percentage (%)
≤20 years	27	18%
21-40 years	96	64%
above 40 years	27	18%
Grand Total	150	100%

Table 1. Age Distribution of Patients

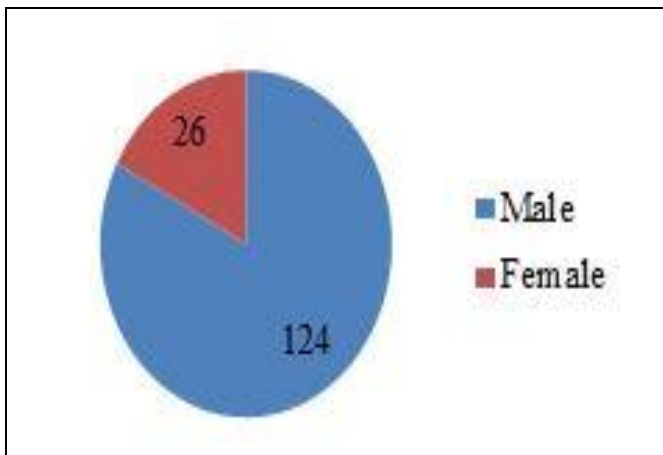


Figure 1. Gender Distribution of Patients
 Note: (■) Male; (■) Female

The observation of clinical examination of ocular injuries due to RTA is enlisted in Table 2 and Figure 2. It is observed from Table 2 that 92% patients had eyelid related which involved abrasion, ecchymosis, laceration, periorbital edema and ptosis, whereas 72% patients had conjunctiva related injury involving conjunctival congestion, circumciliary congestion, subconjunctival hemorrhage, chemosis and conjunctival tear. Corneal involvement in ocular trauma included corneal edema, epithelial abrasion, corneal tear and foreign body. Iris related injuries were iris prolapse, iridodialysis and posterior synechiae. Few cases of RAPD and traumatic mydriasis were also seen. Traumatic cataract and subluxated lens were also noted. Vitreous hemorrhage cases were also noted which resolved after treatment. 2.6% patients had complete loss of vision due to RTA which makes them physically as well as economically dependent.

The observation of this study showed that the 70% patient with ocular injuries were consumed alcohol when met with RTA. Only 15.3% people were using helmet while driving Han, et al. found that 76% patients in alcoholic group had ocular injuries due to RTA while in non-alcoholic group 23% patients met with ocular injuries.

Involvement of ocular structures due to RTA	Frequency	Percentage
Orbit	5	3.30%
Extra Ocular Movement	5	3.30%
Eyelid	138	92%
Conjunctiva	108	72%
Cornea	15	10%
Sclera	3	2%
Anterior Chamber	8	5.30%
Iris	4	2.70%
Pupil	9	6%
Lens	6	4%
Vitreous	2	1.30%
Retina, Choroid and Optic nerve	10	6.60%

Table 2. Involvement of Ocular Structures due to RTA

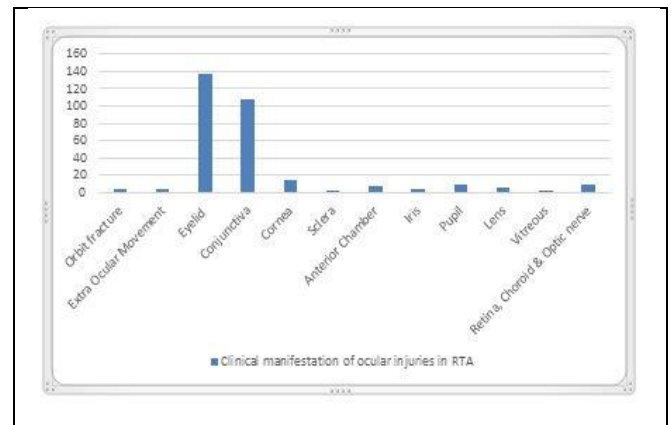


Figure 2. Ocular Manifestations of Injury
 Note: (■) Clinical Manifestations of Ocular Injuries in RTA

DISCUSSION

Ocular injury is one of the preventable public health problem throughout the world. It is one of the common causes of visual morbidity and uniocular blindness. The aim of this study was to know the pattern of ocular injuries and to assess its effect on visual outcome among the patients of RTA in Jagdalpur in Bastar district of Chhattisgarh state. A hospital based, descriptive observational clinical study done over a period of 18 months. A total of 150 cases of ocular injuries in RTA were included in study. Our study indicate that the 64% patient had ocular injuries in RTA belongs to 21-40 age group and mean age of all studied patients were 31.8 years. Similar observation was reported by Sujatha and Bokhari (2021) in their research work done during 2018-19. They reported that out of 126 patients around 56% patient were in 21-40 age group and the mean age was 32 years [17]. Similarly Muralidhar and Chowdhary also reported same pattern regarding age group of ocular injury patient in RTA [18]. Reddy, et al. also reported similar observation in their recent published study. They found that most of patients (around 72%) involved in ocular injuries in RTA had age between 21-40 [19]. Upaphong, et al. had also reported in their study that 51% cases belongs to 20 to 39 years admitted in hospital related to ocular injuries due to RTA [20].

So it can be concluded based on current study and previous studies that the younger patients admitted for ocular injuries due to RTA cases are higher compared to children or older patients. This may be due to the younger people are more likely to drive the vehicle compared to other age group.

Our study also indicates the incidence of ocular injuries is significantly higher (82.7%) in male compared to female (17.3%). Similar observation has been reported in most of the studies. Kumar, et al. reported that 77.6% percent patients were male [21]. A hospital based prospective study published by Gupta also found that male patients admitted for ocular injuries in RTA were 88% [22]. Menon et al., also showed that ocular injuries were more common in males and there was a male:female ratio of approximately 3:1 [23]. While the studies by Puzari, et al. and Cilino, et al. found that male patients

were 80% [24,25]. Other studies also showed a greater percentage of males compared to females [26].

This current study shows that left eyes were affected more (41.3%) compared to right eyes (36%) whereas the 22.7% admitted in hospital with both eyes injured. The study conducted by Patil and Patil showed that right eye was most commonly affected (54.7%) [27]. The research work conducted by Kushwaha, et al. reported that both eye affected patients found fewer (10%) compared to current study which showed that 22.7% [28]. Karve, et al. reported that most of patients had involvement of only one eye, right eye being involved in 196 (49%) cases, left eye being involved in 197 (49.25%) cases and both eyes were involved in only seven (1.75%) cases [29]. So it can be concluded that the side of eye involvement is independent of age and gender of patients.

Clinical manifestation of ocular injuries in RTA in current study showed that 92% patient had eyelid related injuries and conjunctiva related is 72%. 86.6% patients had ecchymosis, 27% patients had lid laceration, 31% patients had periorbital oedema and 45% had abrasion also. Joseph, et al., reported that around 32.6% had lid laceration in RTA [30]. Chaudhary, et al. reported that 29.6% patients had eye lid laceration problem [31].

CONCLUSIONS

This study was the first attempt to record the pattern of ocular injuries in Bastar region of Chhattisgarh state. It was conducted in Ophthalmology Department of G.M.C. and Shaheed Mahendra Karma Memorial Hospital, Jagdalpur (C.G.). This descriptive observational study can be concluded in following points based on the statistical analysis and discussion.

- The higher incidence of ocular trauma in men is attributed to the fact that men in our society are exposed to higher level of risk due to RTA since they are more exposed to highway.
- The age group involved in ocular injuries in RTA is mostly younger since younger age groups are using more vehicles especially two wheelers.
- In ocular injuries due to RTA there are higher chances of closed globe injuries.
- There is higher chance of RTA with alcohol abuse and no use of safety tool like helmet and seat belts.
- RTA can be so severe that it can cause complete loss of eye sight which is a remarkable ocular disability.

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