



OCULAR MANIFESTATIONS OF ROAD TRAFFIC ACCIDENTS- A PROSPECTIVE HOSPITAL BASED STUDY

Ophthalmology

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ABSTRACT

The road traffic accidents are a significant contributor to human sufferings globally. In various studies it was observed that the road traffic accidents resulting ocular injuries make up a significant portion of the overall trauma. These injuries can occur to the eyelids, lacrimal apparatus, orbital wall, periorbital structures, extraocular muscles, conjunctiva, cornea, sclera, uveal tissue, vitreous, choroid, or occasionally the entire globe. The present prospective study was performed to evaluate the various ocular manifestations in Road Traffic Accidents over a period of 09 months from July, 2022 to March, 2023 and involved a total of 80 patients who suffered ocular injuries during RTA and treated as outpatients and inpatients in District Hospital, Reasi, JKUT. Microsoft office 2007 excel sheet was used to tabulate data. Frequency and percentages of the variables were calculated and the results were analyzed. It was found that the most of the patients (35%) were in the age group 21-30 years and were males (88.7%). The most common affected eye was right about 57.5%. Out of the total patients having ocular injuries, 97% were closed globe injuries and 3% were open globe injuries. It was concluded that ocular trauma was more common among patients with two-wheeler RTA and closed globe injuries were the commonest ocular injury.

KEYWORDS

Road traffic accident, Ocular injuries, Eye problems, Accident and Ophthalmic manifestations

INTRODUCTION:

Ocular trauma is a public health issue that can be avoided with safety precautions. The main factor causing monocular visual impairment is eye injury. 7% of all physical injuries and 10% to 15% of all eye illnesses are the results of ocular trauma.^{1,2,3}

Ocular injuries, even those of a minor kind, can place a heavy financial strain on families and society by affecting the working of the patient and caregiver, costly hospitalization, specialized care, extensive follow-up, and vision rehabilitation.⁴

The road traffic accidents are a significant contributor to human sufferings globally and, according to the World Health Organization, it is sixth largest cause of mortality in India.⁵

In various studies it was observed that the road traffic accidents result in ocular injuries make up a significant portion of the overall trauma. These injuries can occur to the eyelids, lachrymal apparatus, orbital wall, periorbital structures, extraocular muscles, conjunctiva, cornea, sclera, uveal tissue, vitreous, choroid, or occasionally the entire globe.⁶ Although eyes typically have a protective bony covering, damage to the globe is not uncommon. Depending on the location and impact of the trauma, injuries to and around the eye can range in severity. They can be as trivial as an eyelid or corneal scratch or as serious as a ruptured globe or lens dislocation.⁷

Functional and aesthetically undesirable abnormalities can be caused by orbital fractures with even minor displacement. Despite the defensive measures, the eyes, one of the body's most fragile tissues, are susceptible to lasting harm.⁸

Thus, the present study was performed to evaluate the various ocular manifestations in Road Traffic Accidents (RTA's).

MATERIAL AND METHODS:

This prospective study was conducted for a period of 09 months from July, 2022 to March, 2023 on the patients who suffered ocular injuries during RTA and treated as outpatients and inpatients in District Hospital, Reasi, JKUT. A total of 80 patients who sustained ocular injuries due to road traffic accidents (also fulfilled the inclusion and exclusion criteria) and attended the causality department & ophthalmology outpatient department of District Hospital, Reasi were included in this study.

Inclusion Criteria:

- 1) Patients between 1 to 60 years of age.
- 2) Patients who were driving or were in the vehicle during accident.

- 3) Patients who met with ocular injuries during the road traffic accidents.

Exclusion Criteria:

- 1) Patients with ocular injuries due to domestic trauma, assault and chemical injuries.
- 2) Previous history of ocular/ head injury

Demographic data and details were obtained and analyzed. Information regarding time, location, type and mechanism of injury use of spectacles, car safety belts and helmets were obtained. Vision, eye findings, diagnostic tests, medical and surgical treatment were recorded. Whenever necessary, X-rays, ultrasonography, CT-scan were done. All the information regarding patients was collected in a predefined proforma on the basis of which results were analyzed and conclusions were drawn.

Statistical Analysis:

Microsoft office 2007 excel sheet was used to tabulate data. Frequency and percentages of the variables were calculated and the results were analyzed.

OBSERVATIONS AND RESULTS:

Table 1: Gender Distribution

Gender	Number	Percentage
Male	71	88.7%
Female	09	11.25%

There were 71 males and 09 females in the study. This clearly indicates male preponderance in road traffic accidents. This may be due to the fact that males are more exposed to the highway/ road traffic when compared to females. (Table 1, Fig. 1).

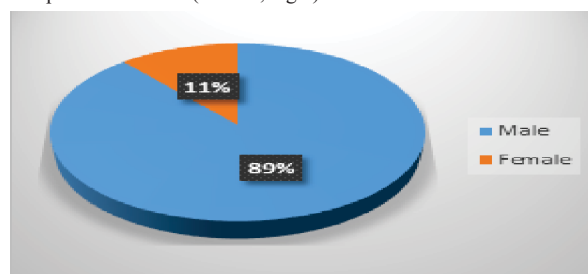


Fig. 1: Gender Distribution

Table 2: Age Distribution:

Age	Number	Percentage
1-10	4	5%
11-20	12	15%
21-30	28	35%
31-40	22	27.5%
41-50	9	11.25%
51-60	5	6.25%

Table 2 & Fig.2 shows that most of the patients 35% were in the age group 21-30 years followed by 27.5% in the age group 31-40 years, 15% in the age group of 11-20 years, 11% in 41-50 year's age group, 6% in 51-60 year's age group with minimum patients in the age group of 1-10 years.

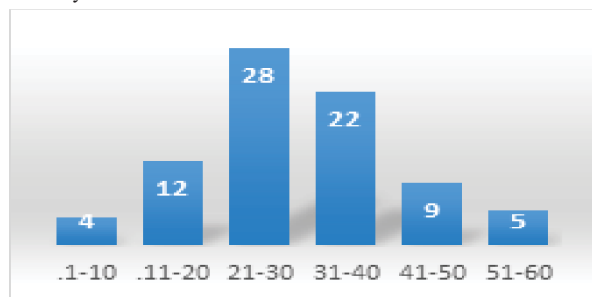


Fig. 2: Age distribution

Table 3: Eye involved in RTA

Eye involved	Number	Percentage
Right Eye	46	57.5%
Left Eye	24	30%
Both Eyes	10	12.5%

Table 3 depicts that Eyes involved were mainly right about 57.5%. In 30% of the patients left eyes were involved. Both eyes were involved in 12.5% patients.

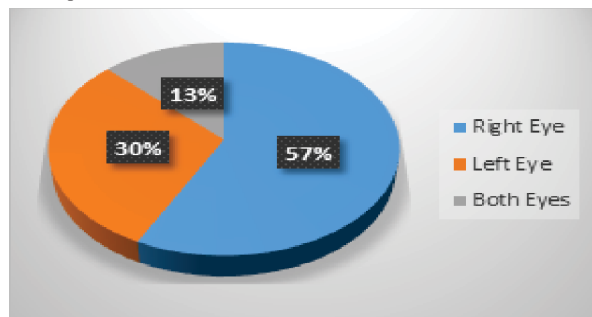


Fig.3: Eyes involved

Table 4: Vehicle Involved

Vehicle involved	Number	Percentage
Two Wheeler	58	72.5%
Four Wheeler	14	17.5%
Other Transport Modes	8	10%

Table 4 depicts that the mode of transport, in the case of 72.5 % patients at the time of the RTA was a two-wheeler, while 17.5% patients were travelling in four- wheelers and 10% used other modes of transport.

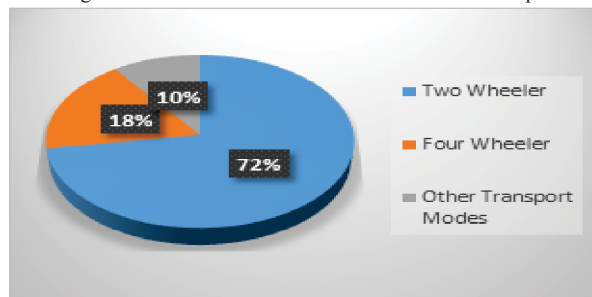


Fig. 4: Vehicle Involved

Table 5: Influence of Alcohol

Influence of Alcohol	Number	Percentage
Alcohol consumed	22	27.5%
No Alcohol consumed	58	72.5%

Influence of Alcohol	Number	Percentage
Alcohol consumed	22	27.5%
No Alcohol consumed	58	72.5%

Table 5 depicts that among the total patients, 72.5% have not consumed alcohol before the road traffic accident whereas 27.5 % patients had consumed alcohol.

Table 6: Open/ Closed globe injuries

Type of globe injuries	Number	Percentage
Closed	78	97%
Open	02	3%

Table 6 depicts that out of the total patients having ocular injuries, 97% were closed globe injuries and 3% were open globe injuries.

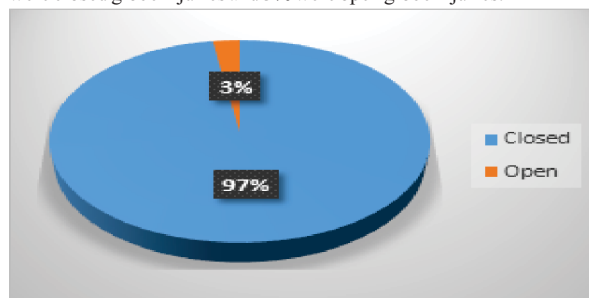


Fig. 5: Type of globe injuries

Table 7: Types of ocular injuries following RTA's

Type of ocular injury	Number	Percentage
Anterior Segment Injuries		
Periorbital Edema	70	87.5%
Periorbital ecchymosis	37	46.2%
Orbital fracture	6	7.5%
Eyelid Edema	70	87.5%
Eyelid Laceration	14	17.5%
Sub conjunctival hemorrhage	76	95%
Corneal Edema	4	5%
Corneal Abrasion	6	7.5%
Traumatic mydriasis	5	6.25%
Traumatic cataract	3	3.75%
Posterior Segment Injuries		
Vitreous Hemorrhage	4	5%
Choroidal Rupture	2	2.5%
Retinal Edema	3	3.7%
Retinal Break	4	5%
Retinal Detachment	3	3.7%

Table 7 shows the findings in the trauma patient's anterior segment/posterior segment involved in the study. In our study a common sign in RTA associated trauma was eye lid edema along with periorbital edema (87.5%). Sub conjunctival hemorrhage (92.7%) was the most common eye sign associated with RTA in eye. Periorbital ecchymosis was present in 46.2% patients. Eye lid laceration was found in 17.5% patients. Those 17.5% patients with severe lid tears required suturing. Further, Orbital fracture was present in 7.5% patients, Corneal Edema in 5% patients, Corneal Abrasion in 7.5% patients, Traumatic mydriasis in 6.25% patients and Traumatic cataract in 3.75% patients.

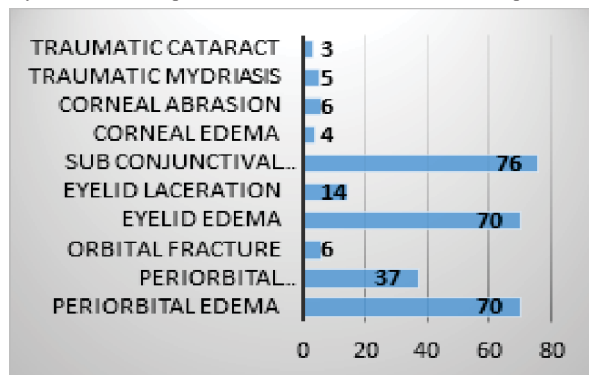


Fig. 6: Anterior segment ocular manifestations

In the posterior segment findings, the most common finding was that of vitreous hemorrhage and retinal tears (5%). 3.7% patients had retinal edema and retinal detachment each. Choroidal rupture was found in 2.5% patients.

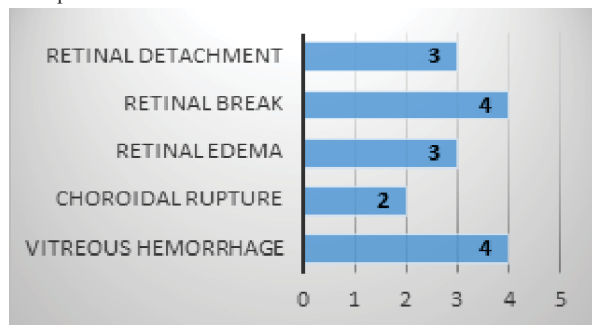


Fig. 7: Posterior Segment ocular manifestations

DISCUSSION

In our study a total of 80 patients with ocular trauma were investigated. The data was analyzed and discussed with previously available literature.

It was found that the most of the patients (35%) were in the age group 21-30 years and were males (88.7%). The most common affected eye was right about 57.5%. In 30% of the patient's left eyes were involved. Both eyes were involved in 12.5% patients. These findings are consistent with the study conducted by M. aRS et al. (2021), found that the majority of the study subjects were males (88.88%) and the mean age was 32 years. Right eye (55.55%) was involved commonly.⁹ In another study performed by M. aRS et al. (2021), Dr. Thota GP (2021) observed that the most common involved age group was 21-30 years and majority of the subjects were males (83.5%). As well as right eye was the most commonly affected among 49.5%.¹⁰

It was reported that mode of transport, in the case of 72.5 % patients at the time of the RTA was a two-wheeler, while 17.5% patients were travelling in four-wheelers and 10% used other modes of transport. As well as 72.5% have not consumed alcohol before the road traffic accident whereas 27.5 % patients had consumed alcohol. These findings are correlated with the studies conducted by M. aRS et al. (2021), Dr. Thota GP (2021) and Reddy DC et al. (2021), found that at the time of the RTA majority of the patients were on two-wheeler and not consumed alcohol.^{9,10,11}

It was observed that out of the total patients having ocular injuries, 97% were closed globe injuries and 3% were open globe injuries. In our study Sub conjunctival hemorrhage (92.7%) was the most common eye sign associated with RTA followed by eye lid edema along with periorbital edema (87.5%), Periorbital ecchymosis (46.2%) and Eye lid laceration (17.5%). Orbital fracture was present in 7.5% patients, Corneal Edema in 5% patients, Corneal Abrasion in 7.5% patients, Traumatic mydriasis in 6.25% patients and Traumatic cataract in 3.75% patients. In the posterior segment findings, the most common finding was that of vitreous hemorrhage and retinal tears (5%). 3.7% patients had retinal edema and retinal detachment each. Choroidal rupture was found in 2.5% patients. These findings are comparable with the study conducted by Shetgar AC et al. (2020), reported that the majority of the patients had Closed globe injuries (85.7%) and 14.3% had the Open globe injuries. In the anterior segment, the most common injuries were subconjunctival hemorrhage (61.9%), followed by conjunctival laceration (20.6%), corneal abrasion (19.04). In posterior segment the most common injury was commotio retinae (6.3%) followed by vitreous hemorrhage (4.76%).¹²

In another study carried out by Menon L et al. (2017) found that the periorbital edema with ecchymosis was the commonest type of injury (68.6%) followed by eyebrow laceration (63.9%) and lid laceration (48.2 %) with ocular injuries in anterior segment. Whereas in posterior segment vitreous or retinal hemorrhage was the commonest injury 4 (2.09%)¹³

CONCLUSION

The present study concluded that ocular trauma was more common among patients with two wheeler RTA. Closed globe injuries were the commonest ocular injury. As the ocular trauma / injury are preventable

injuries, the public awareness regarding safety precautions and traffic rules may play an important role in preventing the RTAs and ocular injuries.

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