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(RESEARCH ARTICLE)

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Ocular manifestations in blunt trauma

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Abstract

Introduction: Ocular trauma is responsible for one-third of monocular blindness, affecting approximately 1.6 million people globally, with 2.3 million experiencing bilateral vision loss and 19 million suffering from unilateral vision loss.[1] In developing countries, eye injuries are commonly caused by activities such as road traffic accidents (RTA), cricket balls, assaults, falls, as well as hammering, agriculture, and carpentry.[2,5] Ocular trauma is a significant cause of preventable blindness and vision impairment.[2] Blunt trauma refers to closed globe injuries where mechanical deformation or direct energy impacts cause damage to the eye.[3] This study aims to investigate the causes, nature, and extent of ocular trauma, enabling the identification of preventive measures and early management strategies to reduce its impact.[1]

Materials and methods: A cross-sectional study was performed on 100 patients with blunt trauma. After taking informed consent, detailed history and ocular examination was done to all patients. Ocular manifestations due to blunt trauma were documented. The association between categorical variables will be analyzed by using Chi-square test. Statistical software SPSS version-20 will be used for the analysis. P value <0.05 will be considered statistically significant.

Results: Out of 100 patients, there were 77 males (77%) & 23 females (23%). majority of the cases fall under 21-30 years (25%), 31-40 years (18%), 41-50 years (15%), > 60 years (16%). the distribution of Modes of Blunt Trauma with road traffic accidents (RTA) accounting for 56%, At Work/Occupational hazards for 18%, At Home for 10%, At Play for 6%, and assaults for 10%. the patient presented in less than < 6 hours is 18%, 6 hours is 22%, 6-12 hours is 10%, >12 hours is 32%, >24 hours is 18%. the Visual acuity after trauma was 6/9 or better in 60% of the patients followed by 6/24 to 6/9 in 18% of the patients the distribution of Ocular Structures injured in patients with blunt trauma with highest incidence are Lid and adnexa 71% followed by Conjunctiva is 38%. the most common findings were Eyelid Edema (71), followed by Ecchymosis (52), Conjunctival Congestion (38), Sub Conjunctival Hemorrhage (27).

Conclusion: This study emphasizes that blunt trauma can result in varying degrees of damage to the eye structures, with the ultimate visual outcome depending on which structures are affected.

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Keywords: Blunt Trauma; Ocular Trauma; Closed Globe Injuries; Eyelid Edema; Conjunctival Congestion

1. Introduction

Ocular trauma is responsible for one-third of monocular blindness, affecting approximately 1.6 million people globally, with 2.3 million experiencing bilateral vision loss and 19 million suffering from unilateral vision loss.[1] In developing countries, eye injuries are commonly caused by activities such as road traffic accidents (RTA), cricket balls, assaults, falls, as well as hammering, agriculture, and carpentry.[2,5] Ocular trauma is a significant cause of preventable blindness and vision impairment.[2] Blunt trauma refers to closed globe injuries where mechanical deformation or direct energy impacts cause damage to the eye.[3] This study aims to investigate the causes, nature, and extent of ocular trauma, enabling the identification of preventive measures and early management strategies to reduce its impact.[1]

2. Materials and methods

The study was conducted in the Department of Ophthalmology of Sri Siddhartha Medical College and Hospital, Tumkur. It was a six months cross sectional study. In the study, we included a total of 100 ocular blunt trauma patients attending our OPD or casualty in which both anterior segment and posterior segment were involved. Patients of both genders, of any age group were included in the study. Purposive sampling method was used. Inclusion criteria involved patients with a definitive history of blunt trauma to the eye of all age groups and sex. And, those with a history of penetrating ocular injury and old ocular injuries> 1 month before consultation to our hospital were excluded. Informed consent and detailed history of the patient was taken. Detailed ocular examination including visual acuity, slit lamp examination, dilated fundus examination along with investigations were done for all the patients.

3. Results

3.1. Demographics

Table 1 Gender Distribution

Gender	No of Cases	Percentage (%)
Male	77	77%
Female	23	23%
Total	100	100%

Out of 100 patients, there were 77 males (77%) & 23 females (23%).

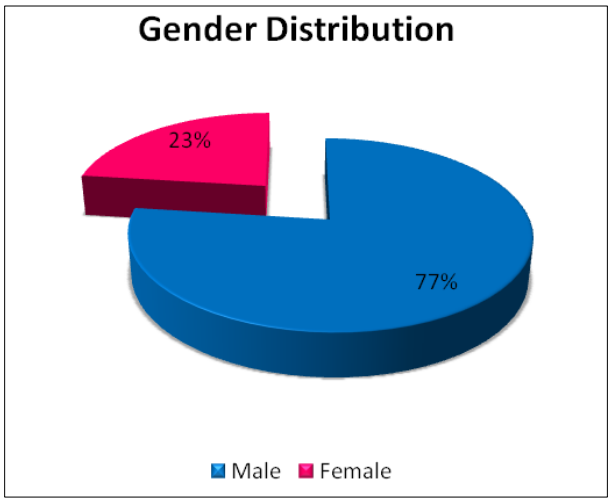

Figure 1 Gender Distribution

Table 2 Age Distribution

Age in Years	No of Cases	Percentage (%)
< 10 years	6	6%
11-20 years	12	12%
21-30 years	25	25%
31-40 years	18	18%
41-50 years	15	15%
51-60 years	8	8%
> 60 years	16	16%
Total	100	100%

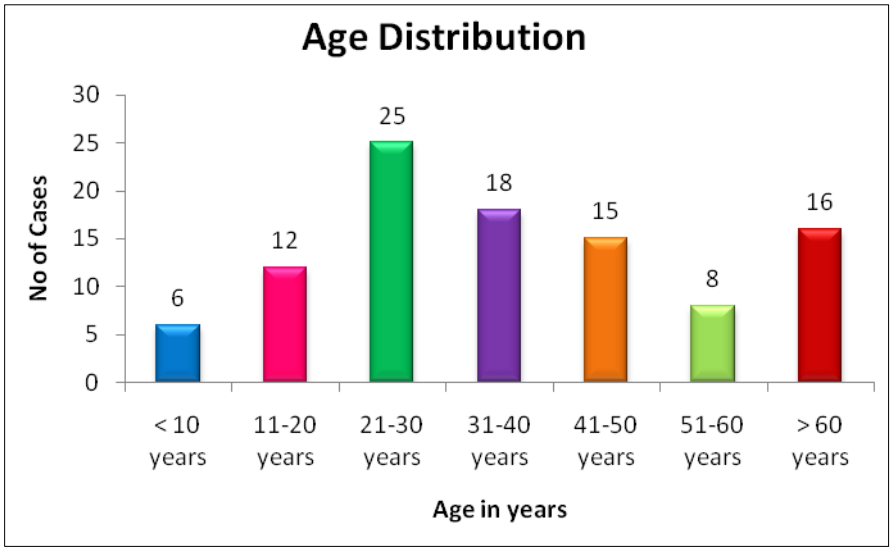

Figure 2 Age Distribution

Table 3 Modes of Blunt Trauma

Modes of Blunt Trauma	No of Cases	Percentage (%)
RTA	56	56%
At Work	18	18%
At Home	10	10%
At Play	6	6%
Assault	10	10%
Total	100	100%

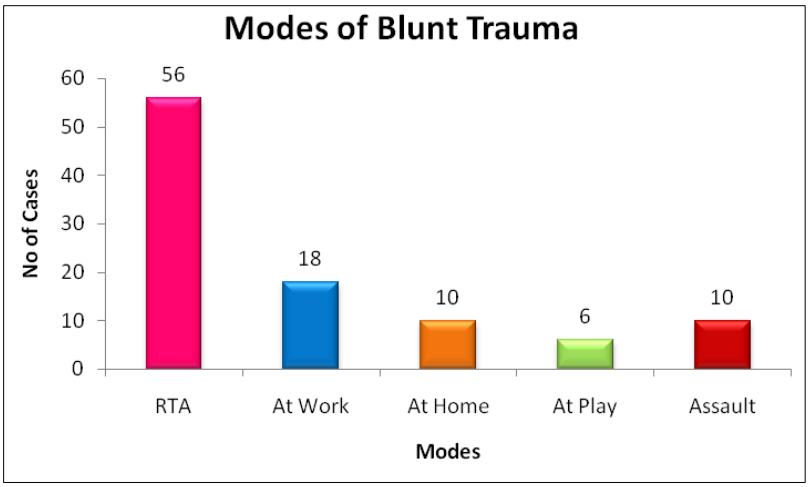

Figure 3 Modes of blunt trauma

Table 4 Duration Since Injury

Duration Since Injury	No of Cases	Percentage (%)
< 6 hours	18	18%
6 hours	22	22%
6 - 12 hours	10	10%
> 12 hours	32	32%
> 24 hours	18	18%
Total	100	100%

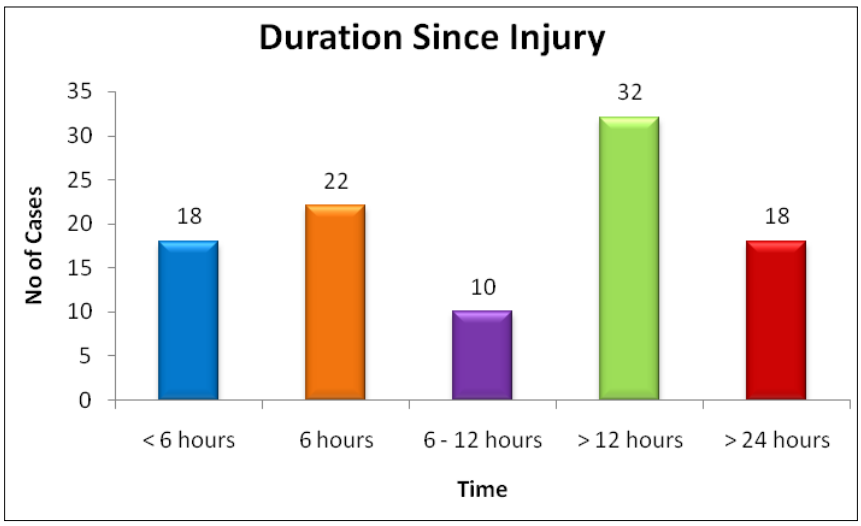

Figure 4 Duration Since Injury

Table 5 Visual acuity after trauma

Visual acuity after trauma	No of Cases	Percentage (%)
PL Negative	0	0%
PL to CF 1m	4	4%
CF 2m to CF 5m	5	5%
6/60 to 6/24	4	4%
6/18 to 6/9	18	18%
6/9 or better	60	60%
Couldn't be assessed	9	9%
Total	100	100%

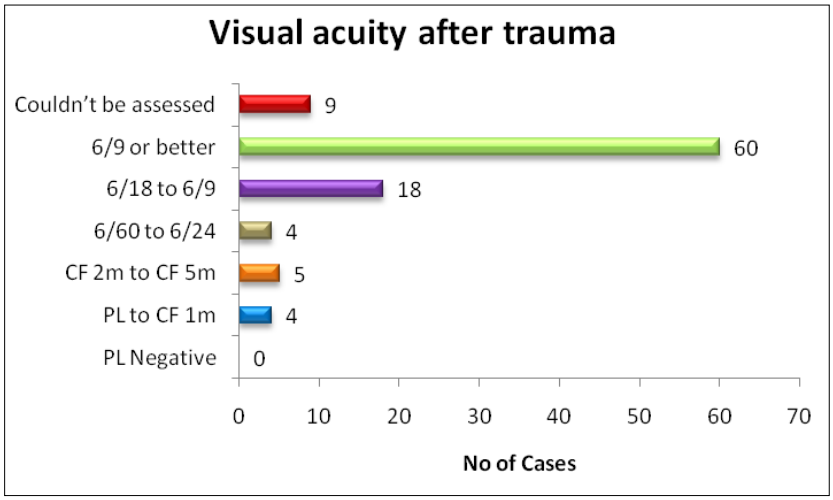

Figure 5 Visual Acuity after trauma

Table 6 Distribution of Ocular Structures injured in patients with blunt trauma

Ocular Structures injured in patients with blunt trauma		
	No. of Cases	**Percentage**
Orbit	**Restriction of extra ocular movements- 2**	**2%**
Lid and adnexa	71	71%
Conjunctiva	38	38%
Cornea	7	7%
Anterior Chamber	3	3%
Iris/ Pupil	2	2%
Lens	3	3%
Posterior Segment	3	3%

Table 7 Injury sustained by ocular structures in trauma distribution

Injury sustained by ocular structures in trauma	
Ocular Involvement	No of Cases
Lid and adnexa	
Lid laceration	26
Lid Edema	71
Ecchymosis	52
Conjunctiva	
Conjunctival Congestion	38
Sub conjunctival hemorrhage	27
Cornea	
Epithelial defect	7
Pigments on endothelium	2
Corneal Edema	2
Anterior Chamber	
Hyphaema	2
AC reaction	1
Injury sustained by ocular structures in trauma	
Ocular Involvement	No of Cases
Iris and Pupil	
Traumatic mydriasis and sphincter tears	2
Lens	
Anterior dislocation	1
Pigments on lens	3
Posteriror segment	
Vitreous haemorrhage	3
Commotio retinae	2
Retinal detachment	1
Others	
Restriction of extra ocular movements	3 (Out of them, 1 had blow out fractures)

4. Discussion

- In our study ,we observed that males were affected more(77%) than females (23%). Our findings indicate that age group 21-30 years were most affected(25%) and the blunt trauma due to road traffic accidents was most common (56%). The structure which was most commonly involved was eyelid (71%), which was followed by conjunctiva (38%).
- In Pai SG et al study, which was a retrospective study of 32 patients with blunt ocular trauma observed that males(68.75%) were affected more than females(31.25%) and the age group which was commonly affected was 10-20 years. The most common cause of blunt trauma in this study was road traffic accidents(28.12%).

The ocular structure which was involved most commonly in this study was conjunctiva (84.375%)followed by eyelid and adnexa(62.5%)[6]

- In Abdul Aziz Makayee study, which was a prospective, interventional study on 200 cases of blunt trauma observed that males were more commonly affected(84%) than females(16%). Incidence of ocular injuries were found to be highest in the younger age group of 16 to 35 years (51%). The most common cause of blunt trauma in this study was injury from stones(18%) followed by sticky injury(12%). The ocular structure which was involved most commonly in this study was conjunctiva(70%)[2]
- The male preponderance(77%) in our study agreed with similar studies done. Trauma from Road traffic accidents, occupational hazards and leading active outdoor life may be responsible for the higher incidence among males. The commonly involved age group was 21-30 years which is similar to other studies. Maximum number of patients presented after 12 hours of trauma.

5. Conclusion

To summarize, in our Study, blunt trauma was more common in males. Most common age group was 3rd decade. Road traffic accidents constituted large number of blunt injuries. The severity of injuries can range from less severe to vision threatening injuries. Early diagnosis and treatment can help in reducing the complications of ocular injuries.

Compliance with ethical standards

Acknowledgments

This work is dedicated to our faculty members.

Disclosure of conflict of interest

The authors declare that there is no competing interest.

Statement of ethical approval

Ethical approval is taken from the Institutional Ethics Committee.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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