Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/18246
DOI URL: http://dx.doi.org/10.21474/IJAR01/18246

RESEARCH ARTICLE

CLINICAL PROFILE AND VISUAL OUTCOME OF OCULAR INJURIES IN TERTIARY CARE RURAL HOSPITAL

Dr. Sarvesh Verma[1] and Dr. Surekha V. Bangal[2]

1. Post Graduate Student
2. Professor, Department of Ophthalmology, Dr. BVP Rural Medical College, Loni, Maharastra.

Manuscript Info

Manuscript History
Received: 30 November 2023
Final Accepted: 31 December 2023
Published: January 2024

Abstract

Purpose- To evaluate extent of damage by ocular injury and to find out visual outcome at the end of 2 months after treatment.

Material And Methods: A Hospital-based, Prospective, Longitudinal study was conducted at tertiary care hospital. A total of 55 patients with ocular injuries were screened and evaluated. Evaluation was done on the basis of detailed history and examination including visual acuity, anterior segment biomicroscopy, fundus evaluation with 90 D was done. Demographic data, etiology and other significant findings were noted.

Inclusion Criteria: Patients with ocular trauma reporting at casualty and ophthalmology OPD were included.

Exclusion Criteria: Patients with intrauterine trauma, birth trauma, war trauma, ultrasonic trauma, radiational trauma, stress trauma were not included in the study.

Results: 55 patients with ocular injuries were screened out of which: Occurrence of ocular injuries were higher in males 85.45% as compared to females 14.54%. Percentage of ocular injuries were higher in age group more than 40 years (45.45%) with male predominance. It was observed that most of the ocular injuries occur while doing domestic work 29.09% as compared to other mode of injuries with contusion trauma 33% being most common type of injury than lamellar laceration 30.90% and penetrating trauma 20%. Left eye (47.27%) more commonly affected than right eye (41.81%). Most of the patients presented within 12 hours of injury (54.54%) with visual acuity >6/60 (43.63%). It was seen that out of 55 patients, 67.27% had normal pupillary reactions,16% had lid tear, 7% had conjunctival foreign body, 5% had conjunctival tear,20% had corneal foreign body, 23.63% had scelerocorneal tear, 9% had hyphema on anterior segment examination and posterior segment findings included retinal hemorrahages 5%. On follow up after 2 months, majority of the treated patients presented with visual acuity of >6/60 89.09%.

Conclusion: Ocular injury is one of the commonest causes of monocular blindness. Ocular injury can occur in any age group, but more common in adult age group (>40years). Incidence of ocular trauma in adults can be decreased by proper use of certain safety

Corresponding Author: - Dr. Sarvesh Verma
Address**: -** Department of Ophthalmology, Dr. BVP Rural Medical College, Loni, Maharastra.

visual outcome depends upon site and size of injury, extent of ocular damage which are the most important factor and the period between time of injury and institution of the treatment.

devices like protective goggles or shield etc, during work. The

……

Introduction: -

Ocular trauma is a major cause of monocular visual impairment and blindness throughout the world. According to the World Health Organization (WHO) estimates, the annual incidence of ocular trauma is approximately 55 million.[1] Globally, there are approximately 1.6 million people who are blind from eye injuries, 2.3 million are bilaterally visually impaired, and 1.9 million have unilateral visual loss.[2,3]It is a significant public health problem, more common in developing countries.It is a preventable public health issue that is leading cause of blindness.Impact of trauma on human eye ranges from minute subconjunctival hemorrhage to a lacerated globe. Eye trauma can result in various intrinsic eye injuries.[4] Blunt trauma can result in **Open** and **Closed globe** injuries. Open globe injuries can be **Laceration** and **Globe rupture**.[5] The closed globe injuries are further classified as **Contusion** and **Lacerations**.The **Laceration** can be due to penetrating injury, perforation injury, or injury due to an intraocular foreign body (IOFB). Blunt eye trauma can be due to coup, countercoup, and anteroposterior compression or horizontal tissue expansion.[6]The mode of injury can be a direct blow to the eyeball or accidental blunt trauma.[7]Globe rupture occurs when there is a defect in the cornea, sclera, or both structures. Global rupture often occurs after direct penetrating trauma; however, if sufficient blunt force is applied to the eye, the intraocular pressure can increase enough to rupture the sclera. The high-velocity impact or sharp cutting objects may result in perforating or penetrating open globe injuries.[8]Closed globe injuries are often seen in pediatric children while playing with friends and at home. The most common pediatric eye injuries are sports-related trauma, wooden stick injury, and thermal burns due to firecrackers. The other common modes of injury can be assault, work place trauma, road traffic accidents, self-fall, and non-accidental injuries.[9]The management depends on the type of injury and the need for surgical intervention. The final visual outcome is governed by mode of trauma, time of presentation, the extent of ocular damage, time of surgical intervention, and post-operative care of the patient.[10]People living in rural areas are often uninformed about protective devices such as goggles and shields. Agricultural work and handling of animals are also major causes of eye injuries. In light of these, this study aims to provide epidemiological data on ocular injury based on our analysis of patients at a hospital in rural rural area Maharashtra.We believe that this data can contribute to efforts toward planning and providing improved eye care as well as implementing preventive measures.

Aim: -

To study clinical profile and visual outcome of ocular injuries in tertiary care rural hospital.

Objectives: -

1. To evaluate extent of damage by ocular injury.
2. To find out visual outcome at the end of 2 months after treatment.

Material and Methods: -

A Hospital-based, Prospective, Longitudinal study was conducted at a tertiary care hospital. A total of 55 patients with ocular trauma were screened and evaluated for a duration of 10 months (June 2022 to March 2023). Evaluation was done on the basis of detailed history and examination including visual acuity, slit lamp examination, fundus examination was done. Demographic data, etiology and other significant findings were noted.

Inclusion Criteria: -

1. Patients with ocular trauma reporting at casualty and ophthalmology OPD were included.
2. Patients irrespective of Age and Gender.

Exclusion Criteria: -

Patients with intrauterine trauma, birth trauma, ultrasonic trauma, radiational trauma, stress trauma were not included in this study.

Results: -

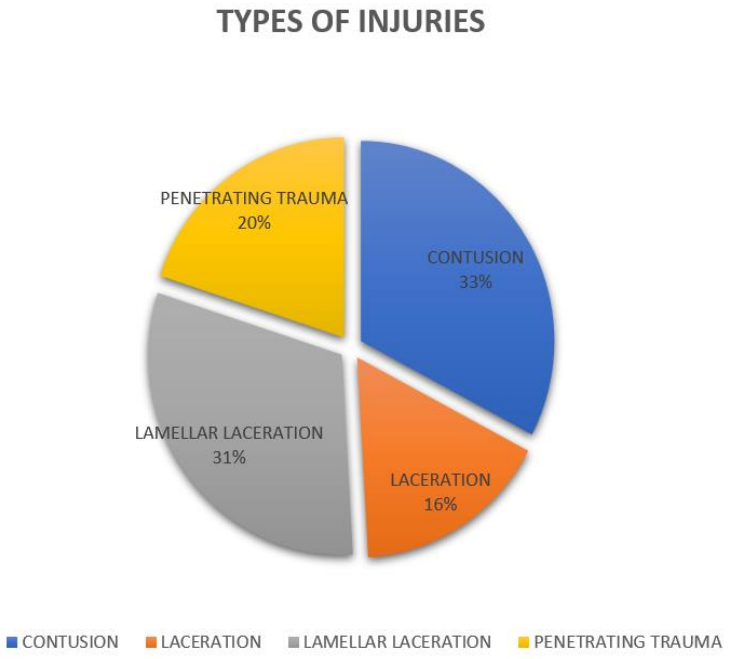
1. Occurrence of ocular injuries were higher in males 85.45% (47) as compared to females 14.54% (8).
2. Percentage of ocular injuries were higher in age group more than 40 years 45.45% (19) with male predominance.
3. **Table No. 1: -** Mode of injury.

MODE OF INJURY	NO. OF PATIENT	%
DOMESTIC WORK	16	29.09%
ROAD TRAFFIC ACCIDENT	14	25.45%
PLAY	10	18.18%
AGRICULTURE WORK	8	14.54%
FACTORY WORK	7	12.72%
TOTAL	55	100%

From the table above it is seen that 16 cases had ocular trauma during domestic work; 14 cases had road traffic accident; 10 cases had during play; 8 cases during agriculture work and 7 while doing factory work.

4. It was observed that the most common type of the ocular injury was contusion trauma 33% (18) which is followed by lamellar laceration 30.90% (17) and penetrating trauma 20% (11).

Graph no. 1



5. **Table No. 2: -** Comparison between gender and type of injury.

Type of Injury	Gender		Total	Fisher's Exact Test
	Female	Male		
Contusion	1	17	18	Fisher's Exact= 8.158
	12.5%	**36.2%**	32.7%	**P=0.021**
Laceration	1	8	9	
	12.5%	17.0%	16.4%	Females are more likely to have penetrating trauma most likely resulting from Domestic or Agriculture Accidents whereas Males are more likely to have Contusion and Lamellar Laceration as result of RTA, Assault, Workplace related injury
Lamellar Laceration	1	16	17	
	12.5%	**34.0%**	30.9%	
Penetrating Trauma	5	6	11	
	62.5%	12.8%	20.0%	
Total	8	47	55	
	100.0%	100.0%	100.0%	

6. **Table No. 3: -** Time interval between trauma and presentation at hospital.

TIME INTERVAL BETWEEN TRAUMA AND PRESENTATION	NO. OF PATIENT	%
WITHIN 12 Hours	30	54.54%
WITHIN 24 Hours	10	18.18%
WITHIN 36 Hours	1	1.81%
WITHIN 48 Hours	7	12.72%
WITHIN 60 Hours	1	1.81%
WITHIN 72 Hours	2	3.63%
WITHIN 1 WEEK	1	1.81%
WITHIN 15 DAYS	1	1.81%
WITHIN 1 MONTH	2	3.63%
TOTAL	55	100%

In our study 54.54% (30) patient presented to the hospital within 12 hours of injury; followed by 18.18% (10) within 24 hours.

7. **Table No. 4: -** Comparison between mode of injury and presentation at hospital.

TIME INTERVAL	MODE OF INJURY					Total	Fisher's Exact
	AGRICULTURE WORK	DOMESTIC WORK	FACTORY WORK	PLAY	RTA		
Within 6 hours	2 8.0%	3 12.0%	1 4.0%	**7** **28.0%**	**12** **48.0%**	25 100.0%	26.462 **P=0.006**
6 to 12 hours	0 0.0%	4 80.0%	1 20.0%	0 0.0%	0 0.0%	5 100.0%	RTA & Play injuries patients presented early and Agricultural, Domestic and Factory work injury patients presented later
12 to 24 hours	3 27.3%	4 36.4%	1 9.1%	1 9.1%	2 18.2%	11 100.0%	
24 to 72 hours	2 20.0%	3 30.0%	3 30.0%	2 20.0%	0 0.0%	10 100.0%	
More than 72 hours	**1** **25.0%**	**2** **50.0%**	**1** **25.0%**	0 0.0%	0 0.0%	4 100.0%	
Total	8 14.5%	16 29.1%	7 12.7%	10 18.2%	14 25.5%	55 100.0%	

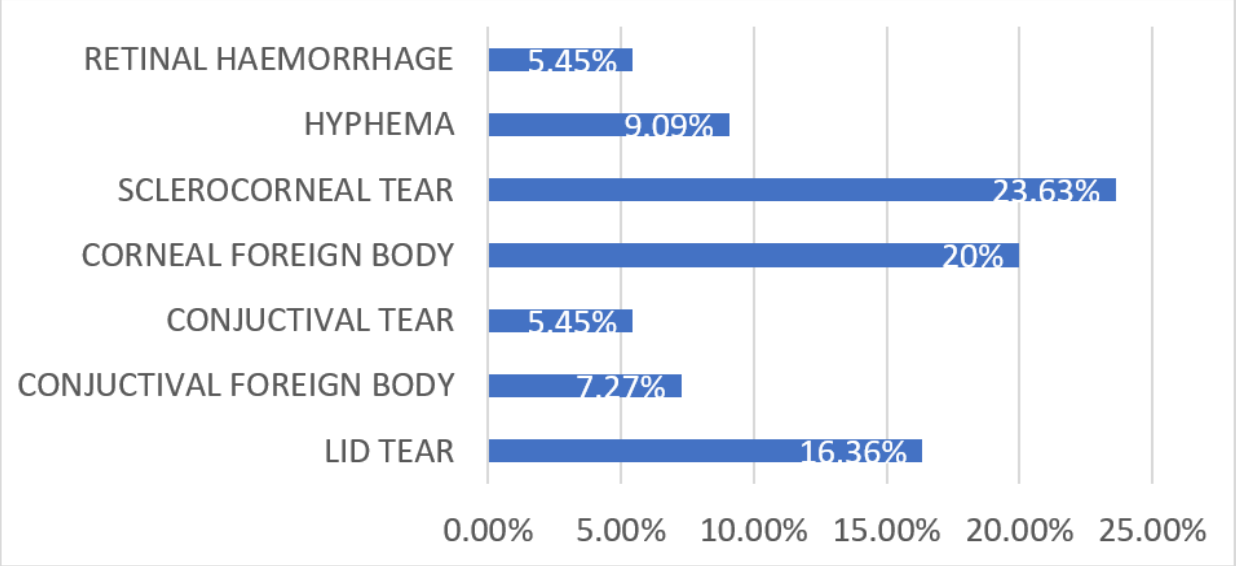
8. **Table No. 5: -** Visual acuity at presentation.

VISUAL ACUITY AT PRESENTATION	NO. OF PATIENT	%
>6/60	24	43.63%
6/60-FINGER COUNTING 1 METER	19	34.54%
BOTH PR+ PL+	5	9.09%
ONLY PL +	2	3.63%
NO PL	1	1.81%
CANNOT BE ASSESED	4	7.27%
TOTAL	55	100%

In our study, 43.63% (24) patients presented with visual acuity more than 6/60; while 34.54% (19) patients presented with visual acuity 6/60 to finger counting 1 meter. While 9.09% (5) patients presented with both PL+ PR+ and 3.63% (2) patients were only PL+. 1.81% (1) patient presented with NO PL as the patient were having severe penetrating trauma. While remaining 7.27% (4) patients their vision cannot be assessed because of multi-trauma.

9. In our study, left eye (26) is most commonly affected than right eye (23). Only 6 patients came with ocular trauma affecting both eyes.
10. In our study, 37 patients presented with normal pupillary reaction, while 12 presented with non-reacting pupil. and in 4 patients, reaction cannot be assessed.

11. **Graph No. 2: -** Showing distribution of ocular findings among study subjects.



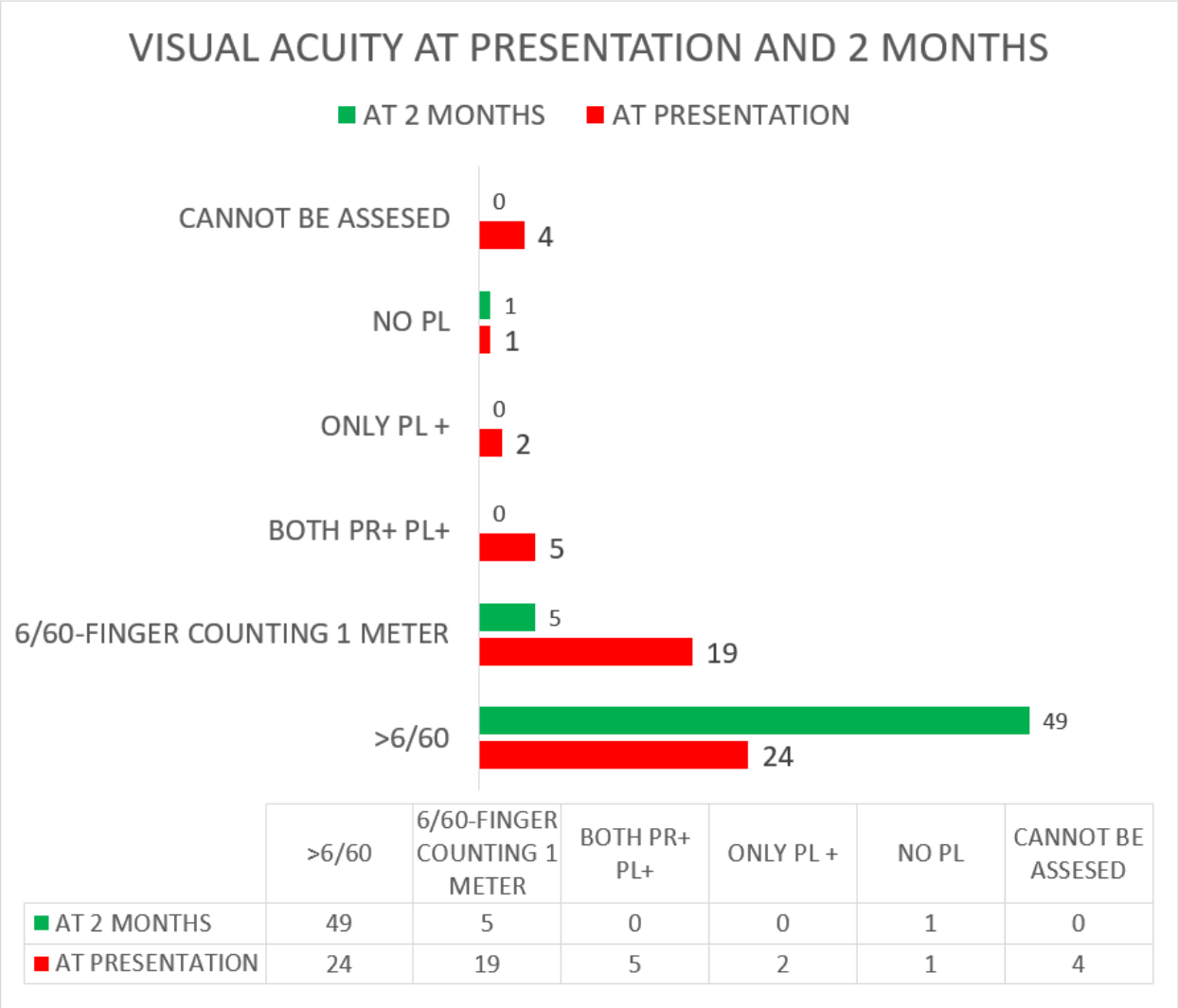
It was observed that 16.36% had lid tear; 7.24% had conjunctival foreign body; 5.45% had conjunctival tear; 20% had corneal foreign body; while 23.63% had sclerocorneal tear; 9.09% had hyphema and 5.45% retinal hemorrhage.

12. **Table no. 6: -** Visual acuity at 2 months.

VISUAL ACUITY AT 2 MONTHS	NO. OF PATIENT
>6/60	49
6/60-FINGER COUNTING 1 METER	5
BOTH PR+ PL+	0
ONLY PL +	0
NO PL	1
CANNOT BE ASSESED	0

Majority of the patient at the end of 2 months had visual acuity >6/60 (49), while 5 patients presented with visual acuity between 6/60-finger counting 1 meter. Only 1 patient presented with no PL.

13. **Graph no. 3: -** Comparison between visual acuity at presentation and 2 months follow-up.



	>6/60	6/60-FINGER COUNTING 1 METER	BOTH PR+ PL+	ONLY PL +	NO PL	CANNOT BE ASSESED
AT 2 MONTHS	49	5	0	0	1	0
AT PRESENTATION	24	19	5	2	1	4

Here, we observed that majority of the patients (i.e.49) attained a vision of >6/60 as compared to vision at the time of presentation (24). 30 patients had presented with a vision of <6/60, while after treatment and 2 monthly follow up only 5 patients had vision <6/60 and only in 1 patient had presented with no PL as he had suffered from severe penetrating trauma.

Discussion: -

1. A Hospital-based, Prospective, Longitudinal study was conducted at a tertiary care hospital. A total of 55 patients with ocular trauma were screened and evaluated. This study was conducted over a period of 10 months June 2022 to March 2023.
2. Occurrence of ocular injuries were higher in males 85.45% (47) as compared to females 14.54% (8). A similar study carried out by **Somen Misra** [11] has recorded that 71.67% were males. Our study also observed 5.87 times more dominance of ocular trauma in males than females. This male preponderance is explained on the basis that men are more commonly involved in agricultural & industrial work.
3. Percentage of ocular injuries were higher in age group more than 40 years 45.45% (19) with male predominance. Our study differs in this regard with the study by **Sao P et al**. [12], who in their study reported that ocular trauma was more common in males (83%) and in the 20–30-year age group.
4. It was observed that most of the ocular injuries occur while doing domestic work 29.09% (16) followed by road traffic accident 25.45% (14). While study done by **Hemlata Y et al**. [13], on 103 patients shows majority of the subjects 52(50.4%) had ocular trauma due to road traffic accidents followed by assault injuries 17(16.5%).

5. In our study the most common type of the ocular injury was contusion trauma i.e 33% cases. **Nirmalan** [14] also observed blunt objects to be the common cause of injury in 54.9% of their cases.
6. From table no. 2, females are more likely to have penetrating trauma most likely resulting from domestic or agriculture accidents as most of the females in rural areas are engaged in domestic and agriculture activity whereas males are more likely to have contusion and lamellar laceration as result of RTA, assault, workplace related injury as most of the males in rural areas are working as driver, or in a factory.
7. From having a look at table no. 4, we can say that the rural patients who experienced ocular trauma while playing and from RTA presented earlier i.e. within 6 hours of injury as compared to rest of the patients as they had multiple traumas associated with it whereas majority of the patients i.e. of agricultural, domestic and factory workers were the late presenters (came post 72 hours) due to illiteracy, ignorance, poor health awareness and belonging to low socioeconomic strata of the society.
8. In our study 47.26% of patients presented with visual acuity less than 6/60, i.e., 'legally blind' in the affected eye. (Table 5). This is consistent with the study done by **Alem KD**, **Arega DD**, **Weldegiorgis ST**, **Agaje BG** and **Tigneh EG** found that 65.9% of ocular trauma cases presented with visual acuity less than 3/60[15].
9. Our study found that most of the ocular injuries are unilateral. We also found that both right and left eye were involved almost equally, right eye injuries being 41.81% (23) & left eye injuries being 47.27% (26). We also found 10.9 cases of bilateral injuries. In similar studies **Sinha** [16] reported right eye preponderance in 68.4% & study in South India rural by **Arvind Hospital** reported 0.4% cases with bilateral injury.
10. In our study it was observed that the majority of the injuries were of sclerocorneal tear 23.63% followed by corneal foreign body 20%, lid tear 16.36% which were sustained by sharp objects or by foreign body particles which are used in the factory or from agricultural equipments and similar findings have been stated in the study by **S. Khatry et al** [17] which reported that 25.8% cases were due to agricultural agents.
11. Graph no. 3, shows that majority of the patients (i.e.49) attained a vision of >6/60 as compared to vision at the time of presentation (24). 30 patients had presented with a vision of <6/60, while only 5 patients had vision <6/60 after treatment and 2 monthly follow up because of penetrating trauma suffered during agriculture work and RTA and only in 1 patient had presented with no PL as he had suffered from severe penetrating trauma.

Conclusion: -

Ocular trauma sustained during agricultural work is an important cause of ocular morbidity in rural India where farming is a major occupation. It still remains a common and preventable cause of ocular morbidity. The commonest age group affected is that of young adult males. Those related to road traffic accidents and household trauma injuries reported immediately within 6 hours. As a result of early intervention and availability of good microsurgical modalities, morbidity has reduced and excellent visual rehabilitation is now possible. The visual outcome depends upon severity of the injury and the time taken for reporting to a specialty eye care centre. Effective mass education is needed for prevention of ocular injuries and seeking early medical help. Eye care programs need to consider ocular trauma as a priority in the rural population.

References: -

1. Negrel AD, Thyefors B.The global impact of eye injuries,Ophthalmic Epidemiol, 1998;5(3):143-69.
2. Négrel AD, Thylefors B. The global impact of eye injuries. Ophthalmic Epidemiol. 1998;5:143– 69.Pizzarello LD.Ocular trauma: Time for action. Ophthalmic Epidemiol. 1998;5:115–6.
3. Scott R. The injured eye. Philos Trans R Soc Lond B Biol Sci. 2011 Jan27;366(1562):251- 60.
4. D, Mwangi N. Assessing an eye injury patient. Community Eye Health.2015;28(91):46-8.
5. Al-Thowaibi A, Kumar M, Al-Matani I. An overview of penetrating ocular traumawith retained intraocular foreign body. Saudi J Ophthalmol. 2011 Apr;25(2):203-5.
6. Ajsic S, Breitkopf R, Bachler M, Treml B. Diagnostic Modalities in Critical Care: Point-ofCare Approach. Diagnostics (Basel). 2021 Nov 25;11(12).
7. Kumar K, Figurasin R, Kumar S, Waseem M. An Uncommon Meridional Globe Rupture due to Blunt Eye Trauma. Case Rep Emerg Med. 2018;2018:1808509.
8. Ababneh LT, Mohidat H, Abdelnabi H, Kana'an MF, Tashtush NA, El-Mulki OS,Aleshawi AJ. Hospital-Based Ocular Trauma: Factors, Treatment, And Impact Outcome. Clin Ophthalmol. 2019;13:2119-2126.
9. Kurien NA, Peter J, Jacob P. Spectrum of Ocular Injuries and Visual OutcomeFollowing Firework Injury to the Eye. J Emerg Trauma Shock. 2020 Jan- Mar;13(1):39-44.
10. Jung HC, Lee SY, Yoon CK, Park UC, Heo JW, Lee EK. Intraocular Foreign Body: Diagnostic Protocols and Treatment Strategies in Ocular Trauma Patients. J Clin Med.2021 Apr 25;10(9).

11. Misra S, Nandwani R, Gogri P, Misra N. Clinical profile and visual outcome of ocular injuries in a rural area of western India. Australas Med J 2013 2018;6:560–4.
12. Sao P, Vallabha K. A profile of ocular trauma in patients attending tertiary care center, North Karnataka. Indian J Clin Exp Ophthalmol 2022;8(3):325-329.
13. Hemlata Yadav, Vaishali Rai, Madhu Chanchlani. "A Study of Profile of Patients with Ocular Trauma in Tertiary Care Center". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 25, June 23.
14. Nirmalan PK, Katz J, Tielsch JM, Robin AL, Thulasiraj RD, Krishnadas R, et al. Ocular trauma in a rural south Indian population. Ophthalmology 2004 2018;111:1778–81.
15. Alem KD, Arega DD, Weldegiorgis ST, Agaje BG, Tigneh EG. Profile of ocular trauma in patients presenting to the department of ophthalmology at Hawassa University: Retrospective study. Plos one. 2019 Mar 28; 14 (3): e0213893.
16. Sinha S. Pattern of trauma to anterior segment of eyes in a tertiary eye care centre of Jharkhand. J Indian Med Assoc 2008 2018;106:289–90.
17. Khatry SK, Lewis AE, Schein OD, Thapa MD, Pradhan EK, Katz J. The epidemiology of ocular trauma in rural Nepal. Br J Ophthalmol 2004 2018;88:456–60.