Original Research Article

# Assessment and evaluation of ocular emergencies in rural indian population: A retrospective study

**Pothala Divya[1], Lt Col Ashutosh Ojha[2], Priyadershini Rangari[3], Dhruvendra Pandey[4*]**

*[1]Medical Officer, Primary Health Centre, Manopad, Gadwal, Telangana, India*
*[2]Associate Professor Medicine, KJ Somaiya Medical College, Sion, Mumbai, Maharashtra, India*
*[3]Associate Professor, Department Of Dentistry, Sri Shankaracharya Medical College, Bhilai, Durg, Chhattisgarh, India*
*[4]Associate Professor, Department of Community Medicine, Government Medical College, Ratlam, Madhya Pradesh, India*

**Received: 04-06-2021 / Revised: 05-07-2021 / Accepted: 15-08-2021**

## Abstract

**Objectives:** The present observational study was conducted to evaluate and assess the ocular emergency prevalence in the rural Indian population and to elucidate health care professionals concerning better prevention and management of these emergencies. **Material and Methods**: This clinical observational retrospective study was carried out Ophthalmology department, from various Indian Rural Hospitals of East and Central India. The available medical records served as the data for assessing ocular emergencies. The results were formulated from the collected data. **Results and interpretation**: Non-traumatic ocular emergencies were 396. Among these, acute glaucoma, conjunctivitis, corneal ulcer, endopthalmitis, neuroopthalamology, Painful Blind Eye, Orbit/Adnexa, uveitis, Vitreo retinal, and miscellaneous injuries seen in respectively 18.93% (n=75), 10.85% (n=43), 21.96% (n=87), 10.01% (n=40), 5.05% (n=20), 4.04% (n=16), 13.88% (n=55), 9.09% 9n=36), 4.04% (n=16), and 2.02% (n=8) study subjects. Total traumatic injuries seen were 1072 of which open globe injuries, closed globe injuries, lid injuries, chemical injuries, Extra ocular foreign bodies, Intra ocular foreign bodies, and miscellaneous injuries were reported by 23.97% (n=257), 11% (n=118),12.96% (n=139), 5.97% (n=64) 41.97% (n=450), 2.42% (n=26) and 1.67% (n=18) study subjects respectively. **Conclusion:** Within its limitations, the present study suggests that an increase in awareness concerning ocular injuries can markedly decrease or prevent the community incidence of ocular injuries. Early intervention and awareness towards ocular injuries can help reduce the health care burden concerning ocular emergencies of non-traumatic origin.

**Keywords:** Acute Blindness, Glaucoma, Ocular Emergency, Open Globe Injury, Work-Related Eye Injury.



## Introduction

Audit in the medical practice describes the quality control mean by which the profession regulates its action for improving the overall care of the patients. In clinical practice, an audit analyzes the data either prospectively or retrospectively to determine the qualitative and quantitative workload of an individual department or institution. Audit includes patients' demographics, mortality, numbers of admissions, and various associated complications [1].

Previous literature data has depicted that ocular injuries of traumatic etiology are more commonly seen in male subjects compared to females. Previous literature studies have also shown that the most common ocular injuries seen were open globe injuries presenting as an emergency. Also, it was seen that the age group most susceptible to ocular injuries are younger males, commonly workers within the age range of 25-44 years. In developing countries like India, agriculture workers/farmers commonly report corneal abrasion, which also leads to microbial keratitis in affected subjects [2].

*Correspondence
**Dr. Dhruvendra Pandey**
Associate Professor, Department of Community Medicine, Government Medical College, Ratlam, Madhya Pradesh, India
**E-mail:** pandit.dhruv06@gmail.com

Cases of ocular injuries present a varied picture ranging from simple foreign body injury caused accidentally to severe injuries that can affect the vision. Despite the wide prevalence and varying nature of ocular injuries seen in rural populations, no literature data present a clear picture concerning ocular emergencies [3]. Hence, the present study aims to evaluate and assess the ocular emergency prevalence in the rural Indian population and to elucidate health care professionals concerning better prevention and management of these emergencies.

## Material and methods

The present observational study was conducted to evaluate and assess the ocular emergency prevalence in the rural Indian population and to elucidate health care professionals concerning better prevention and management of these emergencies. The present study was a retrospective observational study conducted at different institutions established in Rural hospitals in India. The subjects were recruited from the patients visiting the ophthalmology department. Medical records constituted the study data.

The medical records assessed were all the registers maintained by the Ophthalmology Department. The data extracted were gender, age, occupation, presenting complaints, etiology of disease/ trauma if any, the treatment offered, and admission date. The collected data were subjected to the statistical evaluation using SPSS software version 21.0, 2012, Armonk, NY, ANOVA, and t-test. The results were formulated keeping the level of significance at $p<0.05$.

## Results

The present observational study was conducted to evaluate and assess the ocular emergency prevalence in the rural Indian population and to

elucidate health care professionals concerning better prevention and management of these emergencies. The present study was a retrospective observational study conducted at different institutions established in Rural hospitals in India.

The present study included a total of 1468 subjects comprising of both males and females within the age group of 0-65 years with the mean age of 38.4 years. The demographic characteristics of the study subjects are listed in Table 1. There were 63.01% (n=925) males and 36.98% (n=543) females in the present study. Age and gender distribution is shown in Table 1. It was seen that for traumatic injury group, there were 709 males and 347 females, whereas, in non-traumatic group, there were 216 males and 196 females. In traumatic group, there were 16.92% (n=120), 21.86% (n=155), 11% (n=78), and 16.92% (n=120) males, and 7% (n=24), 10% (n=35), 10% (n=35), and 6% (n=21) females in traumatic group respectively. In non-traumatic group, there were 17.12% (n=37), 18.05% (n=39), 12.96% (n=28), and 8.79% (n=19) males in age groups of 0-19 years, 20-39 years, 40-59 years, and more than 60 years respectively in non-traumatic group. Females were respectively 10.20% (n=20), 10.71% (n=21), 10.71% (n=21), and 9.18% (n=18).

**Table 1: Demographic characteristics of the study groups**

| **Age Group** | Male % (n=709) | Female % (n=347) |
|---|---|---|
| **Traumatic Group** | | |
| 0-19 | 16.92 (120) | 7 (24) |
| 20-39 | 21.86 (155) | 10 (35) |
| 40-59 | 11 (78) | 10 (35) |
| 60 or more | 16.92 (120) | 6(21) |
| **Non-Traumatic Group** | Male % (n=216) | Female % (n=196) |
| 0-19 | 17.12 (37) | 10.20 (20) |
| 20-39 | 18.05 (39) | 10.71 (21) |
| 40-59 | 12.96 (28) | 10.71 (21) |
| 60 or more | 8.79 (19) | 9.18 (18) |

Non-traumatic ocular injuries as seen in study subjects are described in Table 2. Concerning non-traumatic ocular emergencies seen, there were total of 396 injuries reported. Among these, acute glaucoma, conjunctivitis, corneal ulcer, endopthalmitis, neuroopthalamology, Painful Blind Eye, Orbit/Adnexa, uveitis, Vitreo retinal, and miscellaneous injuries seen in respectively 18.93% (n=75), 10.85% (n=43), 21.96% (n=87), 10.01% (n=40), 5.05% (n=20), 4.04% (n=16), 13.88% (n=55), 9.09% 9n=36), 4.04% (n=16), and 2.02% (n=8) study subjects. Total traumatic injuries seen were 1072 of which open globe injuries, closed globe injuries, lid injuries, chemical injuries, Extra ocular foreign bodies, Intra ocular foreign bodies, and miscellaneous injuries were reported by 23.97% (n=257), 11% (n=118),12.96% (n=139), 5.97% (n=64) 41.97% (n=450), 2.42% (n=26) and 1.67% (n=18) study subjects respectively as shown in Table 2).

**Table 2: Traumatic and non-traumatic ocular emergencies seen in the study groups**

| **Ocular Emergencies** | **%** | **N** |
|---|---|---|
| **Non-Traumatic (n=396)** | | |
| Acute glaucoma | 18.93 | 75 |
| Conjunctivitis | 10.85 | 43 |
| Corneal ulcer | 21.96 | 87 |
| Endophthalmitis | 10.01 | 40 |
| Neuro-ophthalmology | 5.05 | 20 |
| Painful Blind Eye | 4.04 | 16 |
| Orbit/Adnexa | 13.88 | 55 |
| uveitis | 9.09 | 36 |
| Vitreoretinal | 4.04 | 16 |
| Miscellaneous | 2.02 | 8 |
| **Traumatic (n=1072)** | **%** | **N** |
| Open globe injuries | 23.97 | 257 |
| Closed Globe Injuries | 11 | 118 |
| Lid Injuries | 12.96 | 139 |
| Chemical Injuries | 5.97 | 64 |
| Extraocular foreign bodies | 41.97 | 450 |
| Intraocular foreign bodies | 2.42 | 26 |
| Miscellaneous | 1.67 | 18 |

Open globe injuries were seen in a total of 257 cases. The sites of open globe injuries were Sclera- corneal injuction with uveal prolapse, Sclera-corneal injuction without uveal prolapse, cornea, and sclera affecting 22.95% (n=59), 12.06% (n=31), 61% (n=157), and 3.89% (n=10) study subjects respectively as depicted in Table 3.

**Table 3: Site distribution for Open globe injuries in the study groups**

| **Open Globe Injury Site (n=257)** | **%** | **N** |
|---|---|---|
| Sclera- corneal injunction with uveal prolapse | 22.95 | 59 |
| Sclera- corneal injunction without uveal prolapse | 12.06 | 31 |
| Cornea | 61 | 157 |
| Sclera | 3.89 | 10 |

**Discussion**

The present observational study was conducted to evaluate and assess the ocular emergency prevalence in the rural Indian population and to elucidate health care professionals concerning better prevention and management of these emergencies. The present study was a retrospective observational study conducted at different institutions established in Rural hospitals in India.

The present study included a total of 1468 subjects comprising of both males and females within the age group of 0-65 years with a mean age of 38.4 years. The demographic characteristics of the study subjects are listed in table 1. There were 63.01% (n=925) males and 36.98% (n=543) females in the present study. Age and gender distribution are shown in Table 1. It was seen that for the traumatic injury group, there were 709 males and 347 females, whereas, in the non-traumatic group, there were 216 males and 196 females. In traumatic group, there were 16.92% (n=120), 21.86% (n=155), 11% (n=78), and 16.92% (n=120) males, and 7% (n=24), 10% (n=35), 10% (n=35), and 6% (n=21) females in traumatic group respectively. In non-traumatic group, there were 17.12% (n=37), 18.05% (n=39), 12.96% (n=28), and 8.79% (n=19) males in age groups of 0-19 years, 20-39 years, 40-59 years, and more than 60 years respectively in non-traumatic group. Females were respectively 10.20% (n=20), 10.71% (n=21), 10.71% (n=21), and 9.18% (n=18). These findings were consistent with the findings of Vats S et al[4] in 2008 and Khatry SK et al[5] in 2004 where authors reported similar and comparable characteristics to the present study.

Non-traumatic ocular injuries were also seen in study subjects. Concerning non-traumatic ocular emergencies seen, there was a total of 396 injuries reported. Among these, acute glaucoma, conjunctivitis, corneal ulcer, endophthalmitis, neuro-ophthalmology, Painful Blind Eye, Orbit/Adnexa, uveitis, Vitreoretinal, and miscellaneous injuries seen in respectively 18.93% (n=75), 10.85% (n=43), 21.96% (n=87), 10.01% (n=40), 5.05% (n=20), 4.04% (n=16), 13.88% (n=55), 9.09% 9n=36), 4.04% (n=16), and 2.02% (n=8) study subjects. Total traumatic injuries seen were 1072 of which open globe injuries, closed globe injuries, lid injuries, chemical injuries, Extraocular foreign bodies, Intraocular foreign bodies, and miscellaneous injuries were reported by 23.97% (n=257), 11% (n=118),12.96% (n=139), 5.97% (n=64) 41.97% (n=450), 2.42% (n=26) and 1.67% (n=18) study subjects respectively. These results were in agreement with the findings of Nirmalan PK et al[6] in 2004 and Shah M et al[7] in 2008 where authors reported traumatic and non-traumatic injuries in the Indian population of different geographical nature.

Open globe injuries were seen in a total of 257 cases. The sites of open globe injuries were Sclera- corneal injuction with uveal prolapse, Sclera- corneal injuction without uveal prolapse, cornea, and sclera affecting 22.95% (n=59), 12.06% (n=31), 61% (n=157), and 3.89% (n=10) study subjects respectively. These results of site distribution were consistent with the results reported by previous studies of Fea A et al[8] in 2008 and Karman K et al[9] in 2004 where comparable site distribution was reported by the authors in their respective studies.

**Conclusion**

Within its limitations, the present study concludes that an increase in awareness concerning ocular injuries can markedly decrease or prevent the community incidence of ocular injuries. Early intervention and awareness towards ocular injuries can help reduce the health care burden concerning ocular emergencies of non-traumatic origin. Ocular trauma being a major etiology for vision loss, safety measures and awareness can markedly reduce occupational accidents. Non-traumatic ocular emergencies seen were corneal ulcers of bacterial etiology, hygiene measures can reduce them considerably. However, the present study had few limitations including smaller sample size, shorter monitoring period, and geographical area biases. Hence, further longitudinal studies with a larger sample size and longer monitoring period are required to reach a definitive conclusion.

**Conflict of Interest: Nil Source of support: Nil**

**References**

1. Popovich L, Potapchik E, Shishkin S, Richardson E, Vacroux A, Mathivet B. Russian Federation. Health system review. Health Syst Transit. 2011; 13 (xiii-xiv.): 1-190.
2. El-Sebaity DM, Soliman W, Soliman AM, Fathalla AM. Pediatric eye injuries in upper Egypt. Clinical Ophthalmology. 2011, 5: 1417–1423.
3. Camodeca AJ, Anderson EP. Corneal Foreign Body. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019.
4. Vats S, Murthy GVS, Chandra M, Gupta SK, Vashist P, Gogoi M. Epidemiological study of ocular trauma in an urban slum population in Delhi, India. Indian J Ophthalmol. 2008; 56: 313-6.
5. Khatry SK, Lewis AE, Schein OD, et al. The epidemiology of ocular trauma in rural Nepal. Br J Ophthalmol. 2004; 88: 456-60.
6. Nirmalan PK, Katz J, Tielsch JM, Robin AL, Thulasiraj RD, Krishnadas R, Ramakrishnan R; Aravind Comprehensive Eye Survey. Ocular trauma in a rural south Indian population: the Aravind Comprehensive Eye Survey. 2004; 111: 1778- 81.
7. Shah M, Shah S, Khandekar R. Ocular injuries and visual status before and after their management in the tribal areas of Western India: a historical cohort study. 2008; 246:191-97.
8. Fea A, Bosone A, Rolle T, Grignolo FM. Eye injuries in an Italian urban population: report of 10,620 cases admitted to an eye emergency department in Torino. 2008; 246:175-9.
9. Karman K, Antunica AG, Perk SR. Epidemiology of adult eye injuries in Split-Dalmatian county. Croatian Medical journal 2004; 45: 304-9.