

A Cross-Sectional Study of Ocular Injuries in an Industrial Hospital of Chhattisgarh

¹Dr. Neha Singh Chauhan
Senior Resident

Department of Ophthalmology ESIC Hospital, Pandeypur,
Varanasi, Uttar Pradesh, India

³Dr. Chitra Sunov
Senior Consultant

Department of Ophthalmology Jawaharlal Nehru Hospital
and research centre, Bhilai, Chhattisgarh, India

²Dr. Jayashree Pradhan
Joint Director

Department of Ophthalmology Jawaharlal Nehru Hospital
and research centre, Bhilai, Chhattisgarh, India

⁴Dr. Anuj Singh

Senior Resident Department of Preventive Oncology of
Mahamana Pandit Madan Mohan Malviya Cancer centre /
Homi Bhabha Cancer Hospital, (Units of Tata Memorial
Centre under Dept. of Atomic Energy, GOI) Varanasi, Uttar
Pradesh, India

Abstract:

➤ Introduction:

No doubt 'sight' is the best gift of life from God. Although scientific advancement of 21st. Century has developed many artificial organs for human body but an artificial eye that can see is not developed yet. The ocular injury doesn't lead to death but the consequence in terms of visual impairment or blindness, snatches the zeal to live life. Bhilai, being the industrial area, the load of ocular injury is quite high. Keeping in view, this study was planned to assess the ocular injury cases of this region.

➤ Material Method:

This cross-sectional study was conducted in department of Ophthalmology of Jawaharlal Nehru Hospital and research centre, Bhilai. Total 250 cases of ocular injury came to hospital during 1st August 2016 to July 2017 were assessed for age, sex as well as industrial and non-industrial distribution of ocular injuries.

➤ Results:

Ocular injuries were commonest in the age group 20-29 years (29.2%) and majority of patients were males 75.2% whereas females were 24.8%. Industrial ocular injuries were 18% among that iron chip is the commonest cause 7.6%. However, majority of ocular cases were non industrial 82% and the main mode were domestic injuries and casual accidents 43.6%.

➤ Conclusion:

The first three decades of life are more vulnerable to ocular trauma especially in males because of more exposure to outdoor life. Better compliance with Factories Act, 1948 is the reason of lower incidence of industrial associated ocular injuries in the study denoting safe working environment of this region.

Keywords:- Ocular Injury, Trauma, Vision.

I. INTRODUCTION

Ocular trauma is a preventable public health problem throughout the world. It is one of the common causes of visual morbidity and unocular blindness in all part of world [1]. According to estimates by WHO, about 55 million eye injuries restricting activities for more than one day occur each year, 750,000 cases requiring hospitalization which includes 200,000 open globe injuries [2]. Nearly one-third of eyes lost in the first decade of life are attributable to trauma. Majority of patients with disastrous effect fall in the period of their peak active years. These injuries can occur in almost any setting including sports related activities, workplace, home, rural agriculture setting and road traffic accidents [3]. Young adults are more prone to road traffic accidents, occupational injuries and assault. Children, on the other hand, are more prone to sports and domestic accidents. Industrial accidents are common in adult males, as they are exposed to industrial onslaughts. India being predominantly an agricultural country, injuries is quite frequently sustained while working in the fields.

Eye injuries are devastating to both the victim and the family, both physically and psychologically. In view of the above facts, ocular injuries assume a great deal of socio-economic importance in developing countries involving a huge loss of manpower. Bhilai, being the industrial area, the load of ocular injury is quite high. Keeping this in view, this study was planned to assess the ocular injury cases of this region.

➤ Primary objective:

To study ocular injuries in an industrial hospital of Chhattisgarh.

➤ Secondary objective:

1. To assess age, sex distribution of ocular injury.
2. To assess industrial and non-industrial distribution of ocular injury.

- **Material method:** This cross-sectional study was conducted in department of Ophthalmology of Jawaharlal Nehru Hospital and research centre, Bhilai, Chhattisgarh. Ethical clearance was obtained from the ethical committee of the institute. All the patients of ocular injury came during 1st August 2016 to July 2017 in the OPD and emergency department of Ophthalmology were assessed. A total of 250 cases were selected and informed consent was obtained after application of inclusion and exclusion criteria before the recruitment of the participants in the study.

- **Sample size calculation:** Taking the prevalence of occupational injury as 20% based on previous studies [4-6]. Cochran formula for sample size calculation.

$$n = \frac{(1.96)^2 * p * q}{e^2}$$

➤ *Inclusion criteria:*

- Patients with ocular injury came to the hospital during 1st August 2016 to July 2017.
- Patients willing participate and give informed consent, in case of minor informed consent obtained from parents.

➤ *Exclusion Criteria:*

- Ocular injuries induced by other comorbidities.
- Patients not willing to participate in the study.

II. RESULT

It is evident from Table No.1 that injuries were commonest in the age group 20-29 years (29.2%), followed by 30-39 years (23.6%), 10-19 years (16.8%) and 40-49 years (13.2%) in decreasing order of incidence. Ocular injuries were least in the elderly (i.e., above 50 years). As regards sex distribution, from Table No. 1 it is clear that there were 188 males and 62 females in the present series, thus giving a percentage of 75.2% males to 24.8% females.

As regards sex distribution, from Table No.1 it is clear that there were 188 males and 62 females in the present series, thus giving a percentage of 75.2% males to 24.8% females. Although the incidence of injuries in females was 24.8%, their incidence in industrial group was markedly low (Table No. 2). The incidence in females was only about 17.74% in industrial group while in the non-industrial group it was 82.26% (p value <0.0036).

Table No.2 shows that, although the hospital as well as the place both are industrial but majority of ocular injuries 82% occurred due to non-industrial cause, however industrial ocular injuries were only 18%.

Table No.2 (a) shows the distribution of industrial ocular injury among that iron chip 7.6% is most common cause of injury followed by dust, sand, stone and iron rod i.e. 4%, 25 and 2% respectively.

From table No.2 (b) it is clear that domestic injuries comprise of majority of non-industrial injuries followed by road traffic accidents, fight and assault, and injuries related to sports and games in decreasing order of incidence. Injuries sustained during festival make up 3.91% of non-industrial ocular injuries.

III. DISCUSSION

The commonest age group for ocular trauma was 20-29 years (29.2%) as these are working age group and lower incidence was seen after 50 yrs of age as people are less involved in active jobs. Ojabo CO et al and Sthapit PR et al reported peak incidence in the 3rd decade [7]. Dhasmana R et al reported that 55.29% cases belonged to 21-40 years [9]. Shashikala P et al found 72.2% cases between 20-40 years of age [10].

Incidence of ocular trauma was much higher in males than the females in almost all the studies. In our series, males (75.2%) were affected more than the female (24.8%). Ojabo CO et al and Sthapit PR et al reported 70-80% of injuries in male [7,8]. In India Shashikala P et al reported 75% ocular injuries in male [10]. Misra S et al found 71.6% injuries in male [11]. Lower ratio of 2:1 was reported by Dhasmana R et al in his study done in Uttarakhand [9]. The high incidence of ocular injuries in male was due to more exposure to outdoor life.

Incidence of industrial injury in our study was much less (18%) in comparison to non-industrial cases (82%) because of better public awareness, use of safety protection and pre-employment training.

In terms of etiologic point of view, in our study domestic injuries and casual accidents were 43.6%, RTA 16.8%, fight and assault 10.0%, sports and games 8.4%, and injuries during festivals 3.2%. Ji YR et al reported high figure of occupational injuries 39.95% [12]. In India, Gupta S et al found 32% industrial injuries [13]. Dhasmana et al found 23.86% injury in industrial workers [14]. In our study, non-industrial injuries were 82%. Domestic injuries and casual accidents were commonest type of non-industrial injuries

IV. CONCLUSION

It is observed that ocular trauma is one of the major causes of preventable blindness, which affects mostly the younger age group because of their lifestyle and active involvement in social activity. The first three decades of life are more vulnerable to ocular trauma. Males were more prone to ocular injuries. Whereas better compliance with Factories Act, 1948 is the reason of lower incidence of industrial associated ocular injuries in the study denoting safe working environment of this region. Never the less timely interference, either medical or surgical, not only saved the eye but also gave useful vision.

ACKNOWLEDGMENT

I am appreciative to Department of Ophthalmology for giving me the constant support and guidance. I am additionally thankful to all those who had been related to this research win.

REFERENCES

[1]. The incidence of ocular injuries in males was 75.2% as compared to 24.8% in females. Male/Female ratio was 3.03:1.

[2]. Desai P, Mac Ewen CJ, Baines P, Minaissian DC. Epidemiology and implications of ocular trauma admitted to hospital in Scotland. *J. Epidemiology Comm. Health* 1996; 50: 436-441.

[3]. The incidence of ocular injuries was found to be highest in second, third and fourth decades of life (69.34%).

[4]. Sihota R, Tandon R. *parsons' disease of the eye*. 20th ed. Gurgaon: Elsevier; 2007:362.

[5]. Liu Y, Huang YF, Jiang JJ, Yu JF, Gong YB, Zhou XB, Du GP, Xu QQ. Ocular trauma score in transferred fireworks-related ocular injuries: a case series. *Ulus Travma Acil Cerrahi Derg.* 2012 Jul;18(4):321-7.

[6]. Ong HS, Barsam A, Morris OC, Siriwardena D, Verma S. A survey of ocular sports trauma and the role of eye protection. *Cont Lens Anterior Eye.* 2012 Dec;35(6):285-7.

[7]. Ojabo CO, Adeniyi OS, Ogli SA. Farm-related ocular trauma in Makurdi, Nigeria. *Niger J Med.* 2011 Jan-Mar;20(1):114-9.

[8]. Sthapit PR, Marasini S, Khoju U, Thapa G, Nepal BP. Ocular trauma in patients presenting to Dhulikhel Hospital. *Kathmandu Univ Med J (KUMJ).* 2011 Jan-Mar;9(33):54-7.

[9]. Dhasmana R, Bahadur H, Jain K. Profile of Ocular Trauma in Uttarakhand ,A Hospital Based Study. *Indian Journal of Community Health.* 2012;24(4):297-301.

[10]. Shashikala P, Sadiqulla M, Shivakumar D, Prakash KH. Profile of ocular trauma in industries-related hospital. *Indian J Occup Environ Med.* 2013 May;17(2):66-70.

[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 Nov 30;6(11):560-4.

[12]. Stolyarenko G, Doroshenko D, Salakhutdinov V, Smetanin Y. Removal of large foreign bodies made of thermoplastic material from the eye. *Eur J Ophthalmol.* 2017 Aug 30;27(5):621-625.

[13]. Gupta S, Malhotra A, Gehra A, Yadav R. Pattern of ocular trauma at MLB Medical College, Jhansi(UP)-A retrospective study. *International Journal of Biomedical and Advance Research* 2015;6(8):589-593.

[14]. Dhasmana R, Bahadur H, Jain K. Profile of Ocular Trauma in Uttarakhand ,A Hospital Based Study. *Indian Journal of Community Health.* 2012;24(4):297-301.

ANNEXURE: TABLES

Age group (in years)	Male	Female	Total	Percentage (n = 250)	M/F ratio
0-9	12	5	17	6.8	2.4:1
10-19	34	8	42	16.8	4.25:1
20-29	56	17	73	29.2	3.29:1
30-39	44	15	59	23.6	2.93:1
40-49	26	7	33	13.2	3.71:1
50-59	12	6	18	7.2	2.0:1
60-69	2	3	5	2	0.67:1
70-79	0	1	1	0.4	0:1
80-89	2	0	2	0.8	2:0
Total	188	62	250	100	3.03:1

Table 1:- Age-sex distribution of Ocular injuries

Group	Total cases (n)	Percentage
Industrial	45	18.00
Non- industrial	205	82.00
Total	250	100

Table 2:- Distribution of Industrial and Non-industrialocular injury

Causes of injury	No. of ocular injury	% of total ocular injury (n=250)
Iron chip	19	7.6
Iron rod	5	2
Stone	5	2
Dust, sand	10	4
Nail	1	0.4
Chemical	4	1.6
Radiation	1	0.4
Total	45	18

Table 2 (a):- Distribution of causes industrial Injury

Cause of injuries	No. of cases	% of Non-industrial inj. (n = 205)	% of total inj. (n = 250)
Domestic injuries and casual accidents	109	53.17	43.6
Road traffic accidents	42	20.49	16.8
Fight and assault	25	12.19	10.0
Sports or games	21	10.24	8.4
Injuries sustained during festival, etc.	8	3.91	3.2
Total	205	100	82

Table 2 (b):- Distribution of causes of Non-industrial Injury