

# Profile of Ocular Trauma during COVID-19 Pandemic Lockdown at a Tertiary Center in Eastern Nepal

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## Abstract

**Background:** Ocular injury is one of the most common causes of visual blindness worldwide. It is also an important cause of emergency hospital visits. We aimed to study the clinical profile of ocular trauma during COVID-19 pandemic lockdown.

**Methods:** This cross-sectional study reviewed all the patients who presented with ocular trauma at B. P. Koirala Institute of Health Sciences between 1 April to 30 June 2020. Patient demographics, presenting complaint, duration of presentation, agents, place, settings, pattern, and management of ocular trauma were recorded and reviewed.

**Results:** A total of 73 patients presented with ocular trauma during the study period. The mean age of patient was  $33.96 \pm 18.17$  years. Males were more prone to trauma (male: female = 1.66:1). Most of the trauma occurred during household activities ( $n = 26, 35.6\%$ ). Students were the most vulnerable group ( $n = 26, 35.6\%$ ). The duration of presentation to the hospital (mean  $\pm$  SD) was  $1.77 \pm 0.99$  days. Eleven (15.1%) patients were blind due to trauma (visual acuity  $< 3/60$ ). Blunt object was the main agent ( $n = 42, 57.5\%$ ) and closed globe injury ( $n = 50, 68.5\%$ ) was the main type of ocular trauma during the lockdown. Surgical intervention was required in 32.9% of patients and lid laceration repair (66.7%) was the surgery performed the most.

**Conclusion:** Most of the patients suffered ocular trauma during household activities as outdoor activities were restricted during the lockdown period. Ocular trauma was predominant in the males and the students.

**Keywords:** Corneal perforation; COVID-19; Eye injuries; Ocular trauma; Pandemic

## Declarations

**Ethical approval and consent to participate:** This study was conducted with prior ethical approval from Institutional Review Committee, B. P. Koirala Institute of Health Sciences (IRC/2006/020).

**Consent for publication:** Not applicable

**Availability of data and materials:** The full data set supporting this research is available upon request by the readers.

**Competing interest:** None

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The novel coronavirus first appeared in Wuhan city of Hubei, China and soon became a pandemic [1]. To prevent the spread of this virus, the Government of Nepal announced a national lockdown starting on 23 March 2020. While the hospitals were busy dealing with the emergent COVID-19 positive patients, the non-COVID patients were left unattended basically due to limited transportation, decreased availability of medicines and insufficient human resources. People were hesitant to accompany the sick to the hospital in fear of getting infected with COVID-19. All these factors might have affected the outcome of people sustaining ocular trauma too.

Ocular injury is one of the most common causes of visual blindness worldwide. It has devastating effects on the individual as well as on the socioeconomic status of a country [2, 3]. Playground, school, road, and workplace are common places of injury [4-7]. During the pandemic, these areas either had restricted entry or were entirely closed, which might have decreased the incidence of trauma occurring at these places. However, the incidence of ocular trauma at home were likely to be increased [8].

Published research articles on the impact of lockdown on the pattern of ocular trauma are very few. Therefore, this study was designed to evaluate the profile of ocular trauma that occurred during this period. The results of this study may help us to develop appropriate strategies to decrease ocular trauma and improve ocular trauma-related blindness in such situations.

## METHODS

We reviewed medical records of all patients with ocular injury who visited the department of emergency and the department of ophthalmology at the B. P. Koirala Institute of Health Sciences (BPKIHS), an academic institution and a tertiary level care centre in eastern Nepal from 1 April to 30 June 2020. This study was performed as per the guidelines of the Declaration of Helsinki. An approval from the Institutional Review Committee was obtained.

Records with incomplete data were excluded. Information on patient demographics, visual acuity (VA) at presentation, duration at presentation, agent, place, setting, pattern, and management of ocular trauma were recorded. VA was classified according to the International Classification of Diseases (ICD) 11 [9]. In cases of bilateral involvement, both eyes were included. If a patient had multiple type of injuries, they were sepa-

rately calculated.

Collected data were entered in Microsoft Excel version 2016 and statistical analyses were performed using Statistical Packages for Social Science version 16 (SPSS Inc; Chicago, IL, USA). Descriptive statistics were reported as mean and standard deviation for continuous variables and frequencies and percentage for categorical variables.

## RESULTS

Seventy-three patients had presented with ocular trauma during the three months of lockdown (**Table 1**). There was no missing data. Fourteen (19.2%) patients sustained ocular trauma under the influence of alcohol. Physical assault was the most common cause (n = 9, 64.3%) in such cases. Eleven (15.1%) patients were blind due to trauma at the time of presentation (**Table 2**).

**Table 1:** Demographic profile of patients (n = 73). Values are expressed as mean ± SD or number (%).

Characteristics		Values
Age, (y)		33.96 ± 18.17
Age distribution	Child (0 - 12 y)	7 (9.6)
	Adolescence (13 - 18 y)	6 (8.2)
	Adult (19 - 59 y)	50 (68.5)
	Old (60 y and above)	10 (13.7)
Sex (male: female)		46:27 (63/ 37)
Occupation	Student	26 (35.6)
	Farmer	14 (19.2)
	Domestic Work	13 (17.8)
	Employee	11 (15.1)
	Others	9 (12.3)
	Literacy	Illiterate
	Primary	37 (50.7)
	Secondary	16 (21.9)
	College and Higher	5 (6.8)
Injury under influence of alcohol		14 (19.2)

y: years

Most of the patients had closed globe injury (68.5%), corneal epithelial defect being the most common (**Table 3**).

Most of the patients presented within one and a half day of injury. Most of the ocular injury took place at home (n = 46, 63.0%) (**Table 4**). Twenty-four (32.9%) injuries were severe enough to require surgical intervention and 14 patients (19.2%) required hospital admission. Lid laceration repair was the most common

**Table 2:** Visual acuity at presentation of traumatic eye classified according to the International Classification of Diseases 11 (n = 73). Values are presented as number (%).

Visual acuity	Frequency
Normal (6/ 6 to 6/ 12)	35 (47.9)
Mild Vision Impairment (worse than 6/ 12)	9 (12.3)
Moderate Vision Impairment (worse than 6/ 18)	14 (19.2)
Severe Vision Impairment (worse than 6/ 60)	4 (5.5)
Blind (worse than 3/ 60)	11 (15.1)

**Table 3:** Pattern of ocular trauma (n = 73). All the values are presented as number (%).

Pattern of ocular trauma	Subtotal	Total	
Closed globe injury	Corneal epithelial defect	17 (23.3)	50 (68.5)
	Conjunctival or corneal foreign body	12 (16.4)	
	Sub-conjunctival haemorrhage	9 (12.3)	
	Hyphaema	5 (6.8)	
	Post-traumatic uveitis	2 (2.7)	
	Retinal haemorrhage	2 (2.7)	
	Others (conjunctival laceration, vitreous haemorrhage)	3 (4.2)	
Eyelid injury	Abrasion, laceration, ecchymosis	25 (34.2)	
Open globe injury	Penetrating injury	6 (8.2)	8 (11.0)
	Rupture	1 (1.4)	
	Mixed	1 (1.4)	
Orbital wall fracture		7 (9.6)	

surgical procedure (n = 14, 66.7%). Other surgical interventions included corneal perforation and conjunctival laceration repair. Evisceration for irreparable open globe injury was performed in one patient. COVID-19 Polymerase Chain Reaction (PCR) test were done in patients requiring elective surgery under general anaesthesia. However, if the patient required emergency surgery, PCR test was sent and surgical procedure was carried out following all precautions for COVID-19 as recommended. No case was referred.

## DISCUSSION

The COVID-19 pandemic has created negative impact in healthcare system. This has also significantly affected emergency ophthalmic visits [10, 11].

**Table 4:** Various parameters related to trauma (n = 73). Values are expressed as mean  $\pm$  SD or number (%).

Characteristics	Values	
Time from trauma to presentation (days)	1.77 $\pm$ 0.99	
Settings of trauma	Household activities	26 (35.6)
	Playing	13 (17.8)
	Working at field, farm, workplace	12 (16.4)
	Physical assault	11 (15.1)
	Fall injury	8 (11.0)
Road traffic accident		3 (4.1)
Mode of trauma	Blunt object	42 (57.5)
	Sharp	16 (21.9)
	Chemical	9 (12.3)
	Blast	4 (5.5)
	Therma	2 (2.7)

The mean age of patients presenting with ocular trauma in our study was 33.96  $\pm$  18.17 years. The reported mean age of patients in similar studies were during COVID-19 pandemic lockdown were 41.1 and 43.3 years, which is more than that of our patients [12, 13]. The age at presentation in our study was similar to studies on ocular trauma from our country during pre-lockdown days [14-16]. In our study, adults (19-59 y) sustained ocular trauma the most (68.5%), being the working and most active population. Only 13% of ocular trauma occurred in the elderly (60 y and above). The reason behind this could be because they are usually inactive.

Overall, eyelid injury was the most common type of ocular trauma in our patients (34.2%). Foreign body on ocular surface was the most common type of ocular injury in a study from Italy [12]. Hyphaema was the most common in another study from Philadelphia [13]. Corneal epithelial defect was most common type of globe injury (23.3%) in our study, followed by foreign body on ocular surface (16.4%). This is very different from the reports by Wu et al., but they only studied patients with severe ocular trauma during the pandemic and did not include ocular trauma in general. Our finding is similar to some pre-pandemic studies [15, 17], but different from other studies which showed conjunctival laceration and lid injury as the most common presentation [14, 16, 18]. The percentage of our patients having open globe injury (11.0%) is also similar to that of reports from non-pandemic days [16, 18].

Most of the patients presented to our hospital within one and a half day which is similar to pre-pandemic days. In a study done in central region of Nepal

in 2011, 54.5% patients presented within one day [14]. Hence, we can say that lockdown did not delay our patients who presented with ocular trauma. But comparative data from the same centre will be required to confirm this. However, there was a delay in the presentation during the lockdown (mean difference of 22.7 h) in a study by Wu et al. [13]. Early presentation in our study could be due to access to 24 hours emergency services and teleservices provided by our department. As our hospital is a tertiary care center and COVID-19 level three centre, patients might have been brought directly to our hospital.

Most of the trauma occurred during household activities (35.6%) and the least were road traffic accidents (4.1%). This finding is similar to the results of a study done by Pellegrini et al. which included ocular trauma sustained while doing different household activities like working in kitchen, cleaning home, opening bottles, etc [12]. Previously some pre-lockdown studies have shown workplace as the most common site of ocular injury [14, 16, 18]. Sports related ocular injuries was the most common (55.5%) in the study done in the same centre in 2015, followed by work place related injury (27.9%) [5]. Physical assault or violence accounted for 15.1% of cases which is much higher than another report where an increase from 4.2% to 5.4% in violence related ocular injury occurred during the lockdown [12]. We could not compare it with pre-pandemic era

because of unavailability of data. Nineteen percent of ocular injury in our study was under the influence of alcohol. This would also increase the incidence of ocular injury due to physical assault.

Students sustained ocular trauma the most (35.6%). This is in contrast to pre-lockdown studies where working people sustained ocular trauma the most [18, 19]. This could be due to students being involved in household activities or other forms of recreational activities due to restrictions on leaving home.

The main limitation of the study is we did not compare our results with the previous hospital data.

## CONCLUSION

Most of the patients suffered ocular trauma during household activities as outdoor activities were restricted during the lockdown period. Ocular trauma was predominant in the males and the students.

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