

## Medico-Legal cases related to ocular trauma in North India

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### Abstract


**Introduction:** Basic nature of mechanical injuries is accidental, suicidal or homicidal; so they are often associated with legal problems. This study aims to assess the epidemiology of ophthalmic medico-legal cases in order to acquaint the ophthalmologists with the spectrum of the same, which is prevailing in north India.

**Material and methods:** Retrospective analysis of medical records of all the cases of ocular trauma was done, in which basic nature of mechanical injuries was either accidental or assault, presenting in emergency at ophthalmology department, medical university hospital, central India, between years 2007 to 2014.

**Results:** In the present study 94% patients (96/102) were males. Patients presented with mean age of 30.3±11.9 years (range 10-61 years). Sixty six percent of patients (67/102) were cases of alleged assault by firearms. Most commonly implicated firearm was a country made gun or non-rifled single barrel hand gun. Seventy five percent (77/102) of all cases had open globe injuries. Treating surgeon was asked to provide expert witness in 6 out of 102 cases seen during study duration.

**Conclusion:** It was observed that young adult males of poor rural background are most commonly involved in cases of ocular trauma associated with medico-legal liabilities. Only a very small fraction of cases were pursued in the court for which attending ophthalmologist is called as expert witness.

**Keywords:** Expert witness, India, Medico-legal cases, Ocular trauma.

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### Introduction

Basic nature of mechanical injuries is accidental, suicidal or homicidal; so they are often associated with legal problems. Many such cases may end up in consumer court or in criminal court. Therefore a doctor who has examined and treated such patients will be called to give evidence as expert witness. The quality of such evidence is defined by scientific methodology employed in the investigation.<sup>1,2</sup> Negligence suit may be filed against the doctor if he fails to carry out the medico-legal duties in an accepted way. So, every doctor must be familiar with the procedure of examination and recording of data for medico-legal purpose. No such study from India, assessing the prevalence of medicolegal cases related to ocular trauma prevailing in the region of Uttar Pradesh and adjacent parts of India, have ever been reported.

### Material and Methods

The institutional ethical committee was notified for conducting this Study. Retrospective analysis of computerised medical records of all the cases of ocular trauma was done, in which basic nature of mechanical injuries was either accidental or assault, presenting in

emergency at ophthalmology department, Medical University hospital in central India between years 2007 to 2014. The trauma centre at medical university hospital is a large referral centre in central India for medical emergencies. Ophthalmic emergencies presenting at trauma centre are managed in ophthalmology department, medical university hospital. Cases either presented directly to the trauma centre or were referred from primary or secondary referral centres. A complete history and examination was carried out as in all clinical case. A thorough systematic objective examination was performed on eyes, adnexa, face and body in general. During examination, the type, location, dimensions and presence or absence of foreign bodies in the wound were noted. Accident cum wound certificate was carefully prepared in duplicate by taking a carbon copy. Original copy of this wound certificate was submitted to the police as a confidential report. Duplicate (carbon copy) was kept under safe custody by the institution. Before doing any procedure, an informed written consent was obtained. The date, time and place of the examination were noted. All wounded cases, irrespective of the manner and nature of the injury were intimated to the police station in campus of the institution. All documents sent with the case were read carefully, copied and filed. The medico-legal report was issued on the request of appropriate authorities (court/police) and dispatched to them via registered post. We collected data on demographic details; location, distance from hospital, details of initial contact with health facility, delay in receiving treatment, medico-legal status, mode of injury, details of ocular injury, BETTS classification, associated

trauma, visual acuity, treatment received and the best corrected visual acuity (BCVA) at the time of presentation and 3 months after the treatment.<sup>3</sup> The visual acuity was charted in Snellen's score and was converted to Log MAR equivalent in order to facilitate quantitative comparison and better statistical analysis.

## Results

We retrospectively analyzed the data of 102 patients seen during last 8 years between 2007 to 2014 at the ophthalmology department of medical university hospital. Only the patients of ocular trauma, in which basic nature of mechanical injuries, either accidental or assault, presenting directly to ophthalmology department or being referred for management, were included. Demographic details of the study patients revealed that 94% patients (96/102) were males. The mean age patients were  $30.3 \pm 11.9$  years (range 10-61 years). Maximum number of patients were in age group of 21-30 years (40%) followed by age group 31-40 (24%) and 11-20 (18%) respectively. Most of the patients were farmers (48%) followed by unskilled laborers (25%) in urban and rural areas. (**Table 1**)

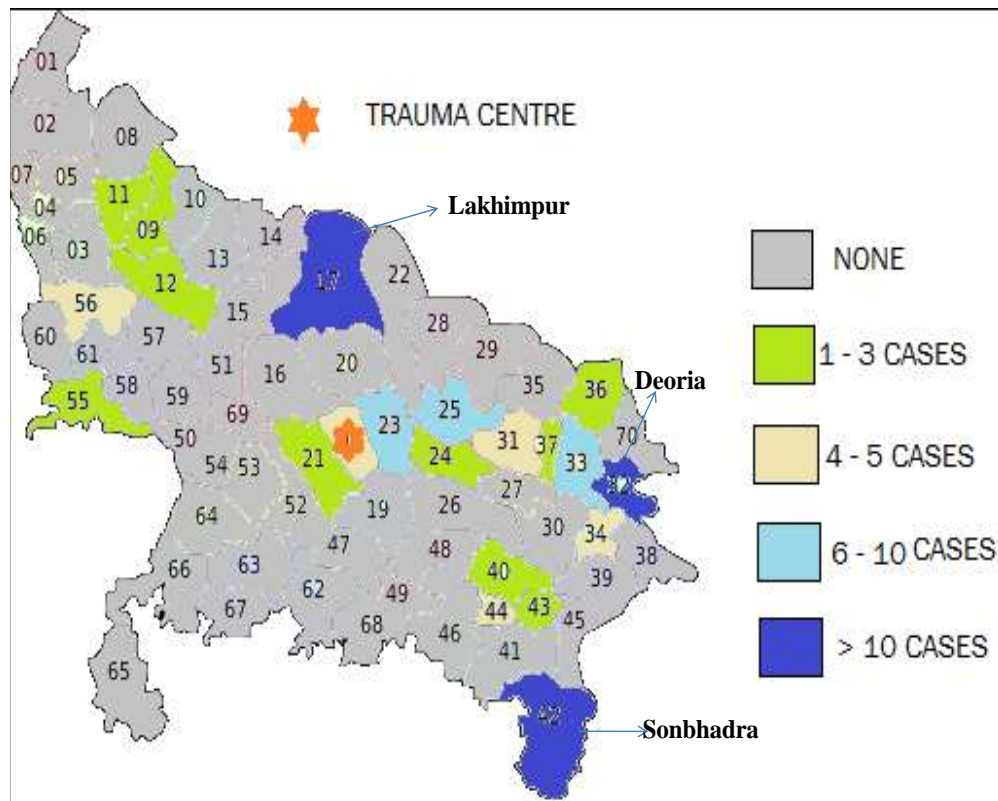
District distribution of the cases revealed the maximum inflow of the medicolegal cases to the trauma centre from three districts (Lakhim pur kheri, Deoria, Sonbhadra) with more than 10 cases. This was followed by other three districts (Gorakhpur, Basti and Barabanki) referring 6-10 cases during that period (**Fig. 1**).

62% (62/102) of patients approached district hospitals for evaluation and management, followed by peripheral health centres 11.5% (12/102), before being referred to trauma centre for management. Eight patients were referred to the trauma centre from two adjoining state medical colleges (Kanpur and Gorakhpur) for management. Only 13% patients directly approached trauma centre (**Table 2**). There was an average time lag of  $10.18 \pm 6.67$  hours between the occurrence of event and contact with the trauma centre. It was minimum ( $3.12 \pm 4.86$  hours) when patient directly reported to trauma centre where as it was  $11.34 \pm 6.57$  hours when patient was referred from a district hospital or a peripheral health centre.

Ninety four percent (96/102) of patients were cases of alleged assault whereas only 6% (8/102) were those of accident. Sixty six percent of patients (67/102) were cases of alleged assault by firearms. Most commonly implicated firearm was a country made gun or non-rifled single barrel hand gun. It was followed by assault by blunt objects in 13.7% (14/102) of cases. Commonly used blunt objects were, stick, brick, iron rod and stone. 14.6% (15/102) cases had the alleged assault by sharp objects like knife and various pointed rural household and agriculture equipment's (**Table 3**).

Clinical details at the time of presentation of study patients revealed 75% (77/102) of all cases had open globe injuries. Closed globe injuries we seen in 24.5% (25/102) of patients. Eighty percent (20/25) of these patients had lamellar laceration of cornea or corneo-scleral region followed by 3/102 patients with laceration of eye ball and 2/102 patients with contusion. None of the cases had any associated mid facial trauma or systemic injuries. Three out of 102 patients had associated head injuries and these were the same patients who sustained injuries during road traffic accidents. BCVA at the time of presentation revealed 96.1% patient with vision  $<6/60$  (LogMAR 0.1) (**Table 4**)

All the patients were advised admission for management. Ninety two percent (94/102) patients required surgical intervention for the management of the underlying condition. Even after 3 months post treatment, 94% patients were legally blind with vision  $<6/60$  (LogMAR 0.1).<sup>4</sup> 4/102 patients had their eye eviscerated or enucleated. Patients with closed globe injuries were reported to have better final visual acuity as compared to those with open globe injuries. Globe could not be salvaged in four out of total of 77 patients with open globe injury as the underlying condition required evisceration or enucleation. Treating surgeon was asked to provide expert witness in 6 out of 102 cases seen during study duration (**Table 5**).



1Saharanpur	21Unnao	41Mirzapur	61Hathras
2Muzaffarnagar	22Bahraich	42Sonabhadra	62Banda
3Bulandshahr	23Barabanki	43Varanasi	63Hamirpur
4Ghaziabad	24Faizabad	44Sant Ravidas Nagar	64Jalaun
5Meerut	25Gonda	45Chandauli	65Lalitpur
6Gautambuddha Nagar	26Sultanpur	46Allahabad	66Jhansi
7Baghpat	27Basti	47Fatehpur	67Mahoba
8Bijnor	28Shravasti	48Pratapgarh	68Chitrakoot
9Sambal	29Balrampur	49Kaushambi	69Kannauj
10Moradabad	30Azamgarh	50Etawah	70Kushinagar
11Amroha	31Ambedkar Nagar	51Farrukhabad	
12Badaun	32Deoria	52Kanpur	
13Bareilly	33Gorakhpur	53Kanpur (Rural)	
14Pilibhit	34Mau	54Auraiya	
15kushinagar	35Siddharth Nagar	55Agra	
16Hardoi	36Maharajganj	56Aligarh	
17Lakhimpur Kheri	37Santkabar Nagar	57Etah	
18Shahjahanpur	38Balai	58Firozabad	
19Rae Bareilly	39Ghazipur	59Mainpuri	
20Sitapur	40Jaunpur	60Mathura	

Fig. 1: District distribution of medico legal cases

**Table 1: Demographic details of the study patients**

Gender		Total Number of study patients (percent)
	Male	96 (94.1%)
	Female	6 (5.9%)
Age ( years)		
	<= 10.00	3 (2.9%)
	11.00 - 20.00	17 (16.6%)
	21.00 - 30.00	41 (40.1%)
	31.00 - 40.00	21 (19.6%)
	41.00 - 50.00	9 (8.8%)
	51.00+	11(10.8%)
Occupation		
	Farmer	49(48%)
	Labourer	25(24.7%)
	Motor Vehicle Driver	2(1.9%)
	Student	6(5.9%)
	Electric Welder	1(0.99%)
	Security Guard	5(4.9%)
	Shopkeeper	8 (7.9%)
	Housewife	6 (5.9%)

**Table 2: First contact with health facility**

Centre of first contact	Total Number of study patients (percent)
Peripheral health centre	12(11.7%)
District Hospital	61(59.8%)
Trauma centre	15 (14.7%)
Other medical college	8 (7.9%)
Private practitioner	6 (5.9%)

**Table 3: Cause and Mode of injury**

Cause of injury		Total Number of study patients (percent )
	Assault	96 (94.1%)
	Accident	6 (5.9%)
Mode of injuries		
	Firearm injury	67 (58.8%)
	Assault by Blunt object	14 (13.7%)
	Assault by sharp object	11(10.7%)
	Road traffic accident	5(4.9%)
	Blast injuries	5 (4.9%)

**Table 4: Clinical details at the time of presentation of study patients**

BETT classification		Total Number of study patients (percent)
	Closed globe injuries	25 (24.5%)
	Open globe injuries	77(75.5%)
Associated injuries		
	Mid facial trauma	None
	Head injuries	3 (2.9%)
	Systemic injuries	None
BCVA		
	>=6/60(LogMAR 0.1)	4 (3.9%)
	<6/60	98 (96.1%)

**Table 5: Details of management and outcome in the study patients**

Management		Total Number of study patients (percent)
	Admission	102 (100%)
	Surgery	94 (92%)
Outcome		
BCVA	$\geq 6/60$ (LogMAR 0.1)	6 (5.9%)
	$< 6/60$	96 (94.1%)
Eviscerated or enucleated		4 (3.9%)
Summon for expert opinion		6 (5.9%)

## Discussion

In India, it is a common perception that a lot of time and effort is required to record evidence and therefore, a large number of medical professionals do not like to be involved in medico legal cases.<sup>5</sup> Even though the primary duty of a doctor is patient care, the medico legal aspects associated with all cases of trauma should get adequate care before the execution of treatment. Record keeping must be accurate, perfect and safe which can be effectively utilized in a court of law in future, if needed.

In the present study, the first of its kind from India to the best of our knowledge, we serially examined 102 medico-legal cases of ophthalmic injuries managed at ophthalmology department during a period of 8 years. There was a distinct predominance of males (96/102) being involved in these cases and maximum (64%) in the age group of 21-40 years. This is due to the fact that young males are predominantly engaged in work and outdoor activities whereas females stay in a more protected domestic environment. We observed that the medico-legal cases were referred to the ophthalmology department from a belt of adjoining districts, which is also the catchment area for ophthalmic cases visiting the ophthalmology department. Surprisingly, a significant number of cases were also referred from far off districts like Lakhim pur kheri, Deoria, Sonbhadra and which are around 300 km from the ophthalmology department. The patients were observed to be coming from even the remote parts of the state. Eighty one percent of patients, especially those coming from far off districts, initially contacted some other government health facility (peripheral health centre, district hospital or other state medical college) before being referred to trauma centre. In spite of availability of the health infrastructure at a district and town levels (district hospitals and community health centre) and provision of an ophthalmologist at these levels, patients regularly get referred to medical college hospitals with inadequate or no treatment, especially those in need of admission services and surgical interventions. The other two medical colleges which accounted for 8% of cases are supposed to have functioning ophthalmology departments with vitreo-retinal units. Government health facilities are reported to be plagued by high absenteeism among health workers with limited opening hours and

medical supplies and poor infrastructure, equipment and skills.<sup>6,7</sup> General lack of accountability of primary and secondary referral centres, resulting in a failure to provide the ophthalmic emergency services at district level, is responsible for inflow of patients from far off districts. In the present study, it was not surprising to observe that 100% of the medico-legal cases that were referred to trauma centre, Medical University hospital, were in need of hospitalization, and 92% were in need of surgical intervention, as these facilities were simply not available at district level government hospitals. Only 6% patients in our study consulted a private practitioner before coming to trauma centre. This may be because private practitioners tend to be clustered in wealthier urban localities and usually focus on high end curative services like cataract surgeries in ophthalmology.<sup>8</sup> Besides, remuneration for expert opinion is not comparable with time spent developing a busy private practice within ophthalmology.<sup>9</sup>

An avoidable delay of average 10 hours was observed between the occurrence of the event and the reporting to the ophthalmology department for documentation and the clinical management. It was even larger if the patient initially contacted some government health facility and then came to trauma centre. Delay in reporting was not only because of the distance of patient's residence from the trauma centre but also because of lack of logistics for referral services. As the physical distance to the health facility is an important determinant for a person to access the health services, roads and transportation network and organized referral facilities play an important role in reaching the socio-economically disadvantaged sections of the society. This may partly explain that most of patients seeking treatment were from a belt of adjoining districts Raibareli, Barabanki, Sitapur, Gonda, Ambedkar Nagar, which are well connected to Lucknow by highways network as shown in Fig. 1.

Majority of patients (94%) reported with assault as the reason for sustaining injury in the eye and only 6% attributed the injuries to accidents. It was not surprising to observe that in spite of a well-known stringent gun control policy, assault by fire arm was attributed as the cause of the injury in almost 2/3 of the cases in the present study. Most of the patients had open globe injury

due to laceration of the globe with retained lead pellet as intra-ocular foreign body. Unlicensed firearms account for 86 to 92 per cent of reported firearm-related murders; out of which Bihar, Jharkhand, and Uttar Pradesh, accounted for almost two-thirds (62.4 per cent) of all victims reportedly murdered by firearms in 2008.<sup>10</sup> Most of the cases (94%), even after 3 months post treatment, were legally blind with vision <6/60 (LogMAR 1.0)

In the present study, out of 102 cases seen over a period of 8 years, there has been summon for only 6 cases for expert opinion in the court. Involvement of rural poor population with these injuries and their failure to pursue the cases in the court explains this pattern. Indian legal system is seen as ineffectual, due to slow speed of the adjudication process for criminal matters. Besides, Corruption is an important issue and to a great extent, is responsible for to this delay. Subsequently, it is not uncommon for the victim to be asked to pay a bribe, “*kharcha-pani*,” (term used in north India for bribe) at each step starting from lodging of First Information Report (FIR) by the police, to the exorbitant fees of the lawyers.<sup>11</sup>

### Conclusion

Young adult males of poor rural background are most commonly involve in cases of ocular trauma associated with medico legal liabilities. Patients mostly have open globe injuries resulting from firearm injury, ending up with legal blindness inspite of adequate treatment. Despite of the initial presentation as MLC, only a very small fraction of cases are pursued in the court for which attending ophthalmologist is call as expert witness.

**Conflict of Interest: None**

**Source of Support: Nil**

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