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An Analysis of Injuries in Medicolegal Cases Encountered in the Accident and Emergency Department of a Tertiary Care Hospital

[1]Sachin Sonawane, [2]Rajesh B. Sukhdeve, [3]Sarah Al Hinnawi and [4]Shivkumar R. Kolle

[1-4]Department of FMT, HBTMC and Dr. R. N. Cooper Hospital, Mumbai, India

Abstract

Injury is one of the leading causes of suffering to mankind and is a significant problem particularly with the view on rapid development and motorisation. They are also the leading cause of death in young adults. Increasing urbanisation has led to changes in the epidemiology of trauma. Road Traffic Accidents is the most common cause of injury seen in cities with varying degrees of mortality. It has become a major public health concern in developing countries like India. Hence, this study was conducted to elucidate the pattern and characteristics of trauma cases which presented to the accident and emergency department of a tertiary care centre in the Western Suburbs of Mumbai. This study was conducted retrospectively by assessment of injury cases that were presented to the accident and emergency department and MLC was registered in the month of January 2022. The results were expressed in frequency and percentage. A total of 1167 injury cases reported to the Accident & Emergency department in the month of January 2022. Majority (30.51%) were in the age group of 21-30 years followed by the age group of 31-40 years (21.51%). Males outnumbered females with a ratio of 3:1. The most common cause of injury seen was physical assault (31.9%) followed by accidental fall (26.7%). Accidents by two-wheelers (43.5%) accounted for most of the road traffic accident injuries. Blunt injuries (61.9%) were most commonly seen in accidental injuries other than fall as compared to sharp force trauma (11.7%). Fall from staircase (19.9%) and fall while playing (17.9%) were the causes of majority of accidental falls reported. While only a few thermal injuries were reported, burns due to dry heat (50%) were common among them. Incised wounds (66.7%) were the most common self-inflicted injury. A good outcome was observed as most of the patients were discharged on OPD basis (71.7%) after getting primary treatment and all referrals done. Majority of the cases were male in the age group of 21-30 years. Assault has remained the most commonly registered MLCs followed by accidental fall. In road traffic accidents, most of the causes of injuries were due to accidents by two-wheelers. In the accidental category other than falls, blunt trauma injuries were the commonest injury seen. Fall from staircase accounts for the majority of cases of fall. Burns were the common cause of thermal injuries. Incised wounds were highest in the self-inflicted category. Highest number of cases were discharged on OPD basis.

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Key Words

Medicolegal case, casualty, assault, injury

Corresponding Author

Shivkumar R. Kolle,
Department of FMT, HBTMC and Dr. R.N. Cooper Hospital, Mumbai, India
hannawi50@gmail.com

Author Designation

[1]Addl. Professor
[2]Professor and Head
[3]Assistant Professor

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INTRODUCTION

As per Section 44 of the Indian Penal Code, Injury is defined as any harm whatever illegally caused to any person, in body, mind, reputation or property[1]. Mechanical injury is any bodily harm caused by a breach in the natural continuity of any body tissue caused by the application of mechanical force[2]. Injury is a major, preventable public health problem in terms of morbidity, mortality or even disability. The development of preventive methods depends on detailed information on the incidence, nature, pattern, and natural course of injury. It is a major overlooked health problem that deserves further study.

As per WHO data, injuries took the lives of 4.4 million people around the world in 2019 and constituted 8% of all deaths[3]. Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years[4]. Falls accounted for over 684 000 deaths in 2019 and are a growing and under-recognized public health issue[3]. The people suffering from non-fatal injuries each year coming to emergency department and care visits, hospitalizations and treatment by hospitals and often result in temporary or permanent disability and the need for long-term physical and mental health care and rehabilitation. Trauma and injury along with mortality and economic losses imposed by morbidity have been recognized to be preventable over the past few decades. However, the development of injury prevention efforts that are effective depend largely on reliable and detailed information on the incidence and pattern of injury sustained.

Injuries have huge medicolegal implications to the doctors in accident and emergency. The examination of the injuries by the doctor help to guide the investigation process. Hence, the identification of common injury patterns and their epidemiology can be used to minimise these incidences in future and prevent morbidity and mortality. The aim of this study is to determine the demographic, epidemiological and outcomes of traumatic medicolegal cases presenting at the accident and emergency department of a tertiary hospital.

MATERIALS AND METHODS

This was an observation cross-sectional study conducted retrospectively over a period of one month at a tertiary health care hospital in Mumbai. The study included all the patients who were registered as medicolegal case by the on-duty casualty medical officer at the hospital itself and had injuries. Data like age and gender of patient, type of MLC case (fall, assault, accidental injuries etc.), pattern of road traffic accident, type of injury seen in accident other than fall, cause of accidental fall, type of thermal injury sustained, pattern of self-inflicted wounds and outcome of the patient was collected from the medicolegal registers of the casualty department maintaining the confidentiality of the patient and recorded in proforma. Data from cases other than injury were not included. The data was analysed using descriptive statistics like frequency and percentages and compared with other studies and observations were presented in the form of tables and graphs.

RESULTS AND DISCUSSIONS

Out of 1441 cases who attended the accident and emergency department, about 1167 cases had reported with injuries which accounted for nearly 81% of MLC cases as shown in Fig. 1.

Table 1 shows the age and gender distribution of the cases that were recorded. Majority of the patients were in the second decade of life, accounting for 30.51% while the least number of patients were seen in the extremes of age groups, i.e., <1 year and 81-90 years. There were very few cases where age was not mentioned (2.23%).

Males outnumbered the females and accounted for almost three times the total number of females, i.e., 74% with a male to female ratio of 3:1. as seen in Fig. 2

The distribution of MLC cases as recorded when they reported to casualty are recorded in Table 2. The results show that assault was one of the most common type of MLC accounting for nearly 31.9% of the total cases. This was followed by accidental falls (26.7%) and road traffic accidents (20.5%).

The table shows than injuries in road traffic accidents were approximately 20.5% of the total number of cases with injuries that reported. They were most commonly reported in two-wheelers including bicycles (43.5%) followed by four-wheelers (19.7%).

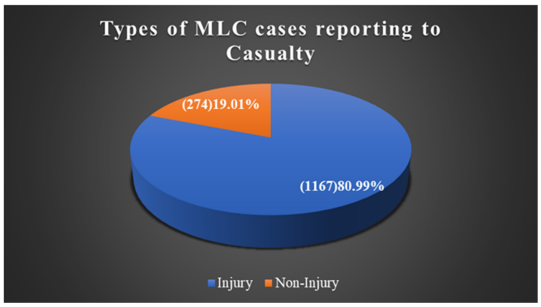

Fig. 1: Types of MLC cases reporting to casualty

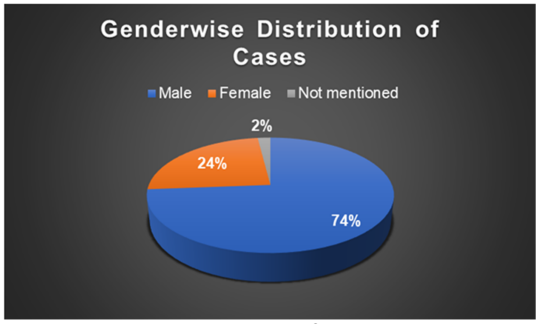

Fig. 2: Genderwise distribution of casas

Table 1: Age wise distribution of injury cases based on age.

Age in years	No. of cases	Percentage
< 1	5	0.43%
1-10 years	115	9.85%
11-20 years	136	11.65%
21-30 years	356	30.51%
31-40 years	251	21.51%
41-50 years	134	11.48%
51-60 years	76	6.51%
61-70 years	38	3.26%
71-80 years	22	1.89%
81-90 years	8	0.69%
Unknown	26	2.23%
Total	1167	100

Table No 2: Distribution of MLC cases reporting with injuries to casualty

Type of cases	No. of Cases	Percentage %
Physical Assault	372	31.9
Accidental Fall (AF)	312	26.7
Road Traffic Accident (RTA)	239	20.5
Accidental Injuries (AI) -other than fall	171	14.7
Fall From Height (FFH)	38	3.3
Self-Inflicted Injuries (SII)	15	1.3
Thermal Injuries	14	1.2
Railway accident	6	0.5
Total	1167	100

Table 3: Pattern of road traffic accident based on vehicle type or pedestrian.

Type	No. of cases	Percentage %
Two-wheeler	104	43.5%
Three-wheeler	45	18.8%
Four-wheeler	47	19.7%
Pedestrian	43	18.0%
	239	100%

Table 4: Pattern of injuries seen in accidental cases other than fall

Type of injury seen in accidental injuries- other than fall	No. of cases (n)	Percentage %
Abrasion	51	29.8%
Contusion	45	26.3%
Laceration	10	5.8%
Not mentioned	35	20.5%
Incised Wounds	15	8.8%
Stab wound	5	2.9%
Injury to Eye	8	4.7%
Injury to Ear	2	1.2%
	171	100%

Table no. 5: Distribution of causes of accidental fall

Causes of Accidental Fall	No. of cases	Percentage
Not mentioned	39	12.5
Staircase	62	19.9
Playing	56	17.9
Bed	35	11.2
Ladder	33	10.6
Slipping	31	9.9
Convulsion	29	9.3
Bicycle	27	8.7
	312	100

Table 6: distribution of thermal injuries

Type of Thermal Injury	No. of cases	Percentage %
Burns	7	50.0
Scalds	5	35.7
Electric burn	2	14.3
	14	100

Table 7: Pattern of self-inflicted injuries

Type of injury	No. of cases (n)	Percentage %
Incised wounds	10	66.7%
Hanging	2	13.3%
Cutthroat	3	20.0%
Total	15	100%

Table 8: Outcome of Injured Patients

Outcome	No. of cases (n)	Percentage %
Admitted	328	28.1%
Dead on Arrival	2	0.2%
Discharged on OPD Basis	837	71.7%
Total	1167	100

In accidental injuries other than fall, abrasion (29.8%) was the most common external injury followed by contusion (26.3%) shown in Table no. 4. There were also reports of injuries to eyes (4.7%) and ears (1.2%).

The commonest causes of accidental fall were fall from or on staircase (19.9%) followed while playing (17.9%). In about 12.5% of the cases the cause of fall was not mentioned as shown in Table no.5.

Thermal injuries were the least reported of injuries forming only 14 cases out of the total as shown in Table 6. Out of that burns (50%) accounted for almost half the cases followed by scalds (35.7%) while electric burns (14.3%) were the least.

Incised wounds (66.7%) were the most common self-inflicted injury (Table no 7) followed by cutthroat (20%) and hanging (13.3%).

Majority of the cases were discharged on OPD basis (71.7%) followed by those cases that were admitted (28.1%) for further treatment. Only 0.2% of the cases were dead on arrival as shown in Table 8.

A retrospective analysis was done for a period of one month at a tertiary health care hospital in Western suburbs of Mumbai. As this is the only municipal tertiary care hospital serving the entire population of Western suburbs of Mumbai, a lot of injuries cases are directly reported or brought to the hospital.

Sociodemographic: The present study revealed that the majority of cases were in the second decade of life. These findings were consistent with studies done in Karnataka[5], in Lucknow[6] and in Bangalore[7] accounting for 34.1% and 42.3 % respectively. Studies done across the border in Pakistan and Nepal also revealed similar findings with relation to age range[2,8-11]. This may be due to the fact that it is the most active age group involved in outdoor activities and more prone to assault, road traffic accidents etc. Morbidity and mortality in this group would be a huge setback for the country.

It was observed that injury cases were more in males (74%) than females. Majority of the studies had similar findings i.e., studies done by D'Souza *et al,* Rastogi *et al,* Sharma *et al,* Chaudhary *et al,* Bharti *et al,* Zaheen *et al,* Hassan *et al,* Uthkarsh *et al,* Windasari *et al,* Aktas[5-14] This may be due to the similar reasons seen above as males are more active and are main working breadwinners in many households, hence they are more exposed to situations or circumstances causing injury.

Type of Injury Related Medicolegal Case: Due to the increased vehicular traffic a lot of road traffic accident cases are also being reported. In our study assault (31.9%) was the most common cause of injury followed by accidental fall (26.7%) and road traffic accident (20.5%). Our study was consistent with those in Miraj15 and Kolhapur in Maharashtra16 as well as in other parts of India like Faridabad, Haryana[17] and Punjab[18] and in other countries like Nepal[12].

The findings in our studies were in contrast to studies done by Aktas[14], Hassan[9] Rastogi[6] Timsinha *et al,* Uthkarsh[7] Bharti[12] Windasari[13] and Swarnkar[19] who all observed that road traffic accident was the most common type of medicolegal cases seen while in cases done by D'Souza[5] Kanwar[20] and Sharma[11] who found that fall was the most common type of injury sustained. However, physical assault formed the top three causes of injury in almost all the studies. The reason for this could be attributed to the geographical and demographical variation of the population as the present study was conducted in the metropolitan city of Mumbai with a heterogeneous population and different social structure as well as socio-economic and education.

Pattern in RTA: Among road traffic accidents, two-wheeler accidents (43.5%) showed the highest number of cases followed closely by four-wheeler (19.7%), three-wheeler (18.8%) and pedestrian (18%). This finding was similar to studies by Badiadka[21] and by Brahmankar and Sharma in Miraj[15], Kishor[22] Uthkarsh[7] Ambade[23] which found that the highest number of accidents cases were caused by two-wheelers. However other studies showed that pedestrians were the highest number of victims[24-27]. This contrast seen may be due to the good traffic sense followed by pedestrians. Also, unlike countries where motorcycle use is limited to recreation and leisure travel, in cities like Mumbai where traffic creates a havoc in daily lives, it is an important means of daily transportation for a significant number of people. For many people, two-wheeler ownership and use are less expensive than car ownership and still gives them independence from public transport. However, rules and regulations are not strictly followed like wearing of helmet and proper enforcement is marred by corruption.

Pattern of Injuries in Accidental Injuries Other than Fall: In injuries other than fall, abrasion (29.8%) was the most common external injury pattern seen followed by contusion (26.3%). Injury to ears (4.7%) and eyes (1.2%) formed a small minority of the cases. In two studies done in Pakistan, blunt injuries contributed to 22% and 72.5% while injuries due to sharp weapons contributed to 38% and 7.9%.9,28 These findings may or may not be specific and depends on a variety of factors like causative weapon or force and circumstances involved.

Cause of Accidental Fall: Fall from or on staircase (19.9%) was one of the most common causes of accidental fall followed by fall while playing (17.9%). Almost all other cases were more or less having the

same number of incidences (n=27-35). It should be noted that in about 12.5% of the cases the cause of accidental fall was not mentioned. A study done in Tamil Nadu found that fall while playing was the most common cause seen in children and that they commonly fell while playing on staircase[29]. In a study by Agarwal *et al* found that 44.3% of accident were reported to be fall at level and fall from height[18].

The increased number of cases seen due to fall from or on staircase may be attributed to the narrow, heighted staircases which are seen in urban slums which are of wrought iron outside and cement inside. They are often unsupported by railing and a danger even in the non- monsoon weather.

Type of Thermal Injury: Thermal injuries formed only a small incidence of cases of injury that reported to the casualty contributing to only 1.2% of the total number of injury cases. Out of that, burns due to dry heat was 50%, followed by scalds or burns due to moist heat (35.7%) while electric burns were only 14.3%. Aggarwal[30] described thermal injury (3.8%) as burns/electric burns. Choudhury and Singh[31] reported thermal injuries (11.7%) while Haridas and Pawale[16] (5.7%) reported burns as suicidal, accidental, from history.

There are many risk factors associated with burns included cooking on open fires, gas leakage, and explosion of pressure stoves, use of unprotected open fires to keep warm during winter and unsafe storage of inflammable substances. Scalds are common seen in younger age groups due to accidental spillage. As the month was not during the monsoon season, incidences of electric burn reported were very few.

Pattern of Self-inflicted Injury: Incised wounds (66.7%) were the most common self-inflicted injury followed by cutthroat (20%) and hanging (13.3%). This was similar to other countries like Turkey where self-injury by sharp instrument was the most common cause of attempted suicide following drug intake and chemical agent[14]. A study done in north India also showed that hanging was the most common cause of self-inflicted injury[32].

Sharp cutting instruments are widely used in homes and various businesses and such instruments do not require any license and are freely available in the market. Hence, they are generally the easiest weapon available for suicidal attempt or self-inflicted harm. Hanging is the next most common method due to the easy availability of nylon rope, generally used as an instrument for drying or hanging clothes and a high surface. Hence, various suggestions should be given to the patients at the time of discharge on how to handle the stressors and everyday tensions of modern life.

Outcome of Injured Patient: The most common outcome in the present study of medicolegal cases recorded in the Casualty Department was discharge on OPD basis (71.72%) followed by admission (28.11%). The findings were concurrent with the outcomes reported by Kharat[33] which showed 54.41% were treated on OPD basis while 47.59% cases were admitted.

A higher number was reported by Mir[34] where 81% were treated on OPD basis and 6-8% left against medical advice. Mina[35] found that a similar number of cases, i.e., 78.9% were discharged on OPD basis after consultation with the respective departments. This can be explained by the fact that there is awareness among the people of the health services as well as the effectiveness of the treatment provided in the tertiary health setup.

CONCLUSION

The age and gender distribution of medicolegal cases of the present study and previous studies were consistent, with the most common age group was 20-30 years and predominance of the male cases contributing more than 3/4th of cases seen. Most of the previous studies showed road traffic accidents as the most common types of the medicolegal cases. The present study showed a preponderance of assault cases. It could be due to the change in geographical location and social profile of area studied. Proper counselling for controlling aggression in youth have to be promoted as well as directing them towards productive work. About 3/4th cases were treated on OPD basis in casualty.

Casualty or emergency department receives the majority of case load including medicolegal cases. Administration of justice will prevail if detailed examination and its interpretation is performed in cases of physical assault by treating doctor. The doctor treating the injury should always examine the wound carefully. This can be beneficial in evaluating and interpreting such injuries and also in assisting law enforcement agencies, particularly the judiciary, in reaching logical decisions.

Limitations: The study was a cross-sectional study with data from a single centre so the results cannot be generalised to a national level for which future large-scale multi-centre studies with a large sample size are recommended.

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Conflicts of Interest: The authors declare no conflict of interest

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