THE PATTERN OF INJURIES DUE TO FATAL ROAD TRAFFIC ACCIDENTS IN AND AROUND KHAMMAM

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ABSTRACT

BACKGROUND

A road traffic accident is defined as any vehicular accident occurring on a public road or highway and includes vehicular accidents where the place of occurrence is unspecified. Road traffic accident [RTA] is one of the major preventable public health problems and is on the rise which can be attributed to increase in the number of vehicles, life style changes, and risky attitude.

Objective of this study is to ascertain the incidence, profile of victims, patterns of injuries due to RTA, causes, mechanism of injury and preventive measures of factors contributing to causation of accidents.

MATERIALS AND METHODS

The present retrospective study was carried out at Dept. of Forensic Medicine of a tertiary care institution from Khammam. All the deaths due to road traffic accidents brought to Mamata General Hospital, Khammam during the period Jan. 2016-Dec. 2016 were retrospectively analysed. The detailed analysis of these cases was based on the inquest report, medical records, visiting scene of accident and evaluation of autopsy reports. Out of 768 medicolegal autopsies conducted during the study period, 108 [14.06%] were of vehicular accident fatalities.

RESULTS

Majority of male victims were found in the age group 21-40 years with a percent of 56.48%. Most of the victims (97) were male. Highest number of cases were 49 [45.37%] during day time, on the national highways were 60 [55.55%]. We observed that the highest number of cases 60 [55.55%] occurred during winter season, on weekend days [Fridays, Saturdays and Sundays]. The commonest {62 [57.40%]} type of crash pattern was 2WH to LMV. The commonest road users involved in accidents is two wheeler followed by pedestrian. At the time of accident, majority of victims 66 [61.11%] were non-helmet riders seen in two wheeler users. Fissured fracture was the commonest type. The commonest variety of intracranial haemorrhage was subdural haemorrhage. Human error is the most common cause of road traffic accidents. We found 83[76.85%] of the victims of RTAs died either on spot or within 24 hours of the accident. The head injury was responsible for most of the deaths.

CONCLUSIONS

The incidence is 14.06%. The commonest affected age group is 31-40 years, Male, occurred during winter season, on weekend. Highest number of cases occurred during day time, on the national highways. The commonest crash pattern was 2WH to M. The commonest road users are two wheelers followed by pedestrians. With regard to pattern of injuries, musculoskeletal injuries topped the list of injuries. We found multiple injuries of soft tissue & bony injuries among different types of road users. Most of the victims were non-helmet riders at the time of incident. Commonest type of skull fracture is fissured fracture and intracranial haemorrhage type is SDH.

KEYWORDS

Road Traffic Accidents, Road Users, Crash Pattern, Fatal Injuries.

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BACKGROUND

A road traffic accident is defined as any vehicular accident occurring on a public road or highway and includes vehicular accidents where the place of occurrence is unspecified. Road traffic accident [RTA] is one of the major preventable public health problems and is on the rise which can be attributed to increase in the number of vehicles, life style changes, and risky attitude.

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Accidents occur not only due to ignorance but also due to carelessness, thoughtlessness and over confidence. Human, vehicular and environmental factors play a role before, during and after road traffic accidents.[1] The problem is so severe that by 2020, it is projected that road traffic disability-adjusted life years [DALYs] lost will move from being the 19th leading cause of disability –adjusted life years lost to the 3rd leading cause in developing countries.[2]

Road traffic accidents kill an estimated 1.3 million people and injure 50 million people per year globally. The magnitude of RTAs and fatalities in India is alarming. According to National Crime Records Bureau, 51 cases of RTAs took place very one hour during 2015, wherein 16 persons were killed. During 2014, a total of 4, 50,898 cases of RTA were reported which resulted in 4,77,731 persons injured and 1,41,526 deaths. Deaths due to RTAs in the country have increased by 2.9% during 2014 [1,77,526] over 2013 [1,37,423].[3] These

numbers translate into one road accident a minute and one road accident death every four minutes.

However, this is an underestimate, as not all injuries are reported to the police. This indicates that the surveillance system of vehicular accidents is not well established in India.[4]

This study is to ascertain the incidence of fatal vehicular accidents and patterns of injuries with emphasis on traumatic brain injuries amongst RTA victims, and their preventive measures.

Aims & Objectives

- To ascertain the incidence, profile of victims.
- To study the patterns of injuries due to RTA, causes, mechanism of injury.
- Preventive measures of factors contributing to causation of accidents.

MATERIALS AND METHODS

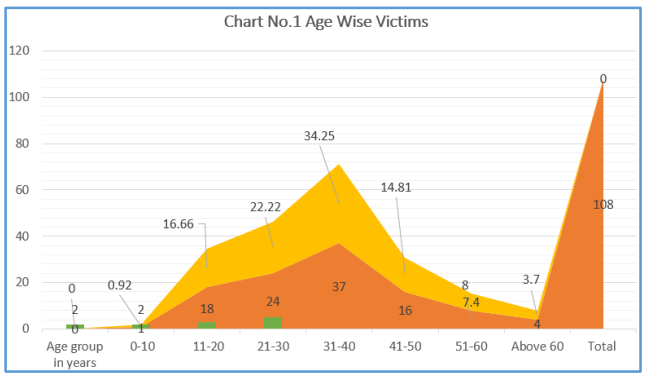
The present retrospective study was carried out at Dept. of Forensic Medicine of a tertiary care institution from Khammam. All the deaths due to road traffic accidents brought to Mamata General Hospital, Khammam during the period Jan. 2016-Dec. 2016 were retrospectively analysed. The detailed analysis of these cases was based on the inquest report, medical records, visiting scene of accident and evaluation of autopsy reports.

Out of 768 of medicolegal autopsies conducted during the study period, 108 [14.06%] were of vehicular accident fatalities. Only those cases were selected which had a definite history of road traffic accidents. A detailed analysis of the pattern and incidence of various injuries sustained by RTA victims carried out. Besides, features pertaining to hosts [road users], day wise pattern of accidents, crash pattern, severity of injuries, duration of survival of victims, types of skull fractures sustained, types of intracranial haemorrhage involved and alcohol/drug abuse by person, etc. will be studied.

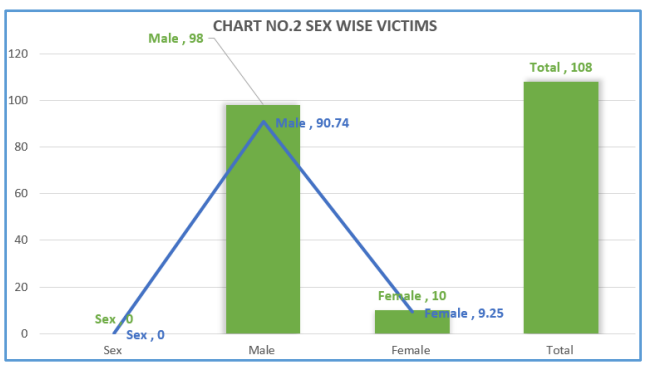
RESULTS AND DISCUSSION

Out of 768 of medicolegal autopsies conducted during the study period, 108 [14.06%] were of vehicular accident fatalities. The accidents contributed for most of deaths due to RTA, two wheeler users and pedestrians have the highest rates of fatal injuries. These are similar to other studies.[4,5]

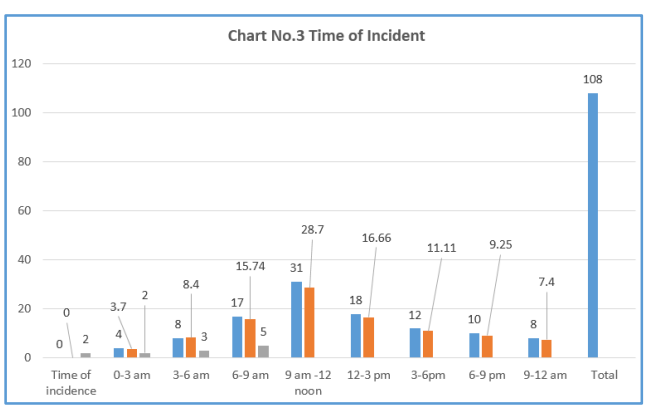
The commonest vulnerable age group was 30-40 years, 37 [34.25%]; followed by 20-30 years, 24 [22.22%]. Next age group was 11-20 years, 18 [16.66%]; and in age group 41-50 years was 16 [14.81%]. In extreme age group persons, least cases were found in this study. Tendency of this age group of 20-40 years show scarce attention to traffic rules & regulations and non-use of safety devices like helmets, seatbelts, restraints, etc. can be a possible explanation for the same. This shows that the people of the most active and productive age group are involved in RTA, which adds a serious economic loss to the community. These are consistent with authors.[3-6]



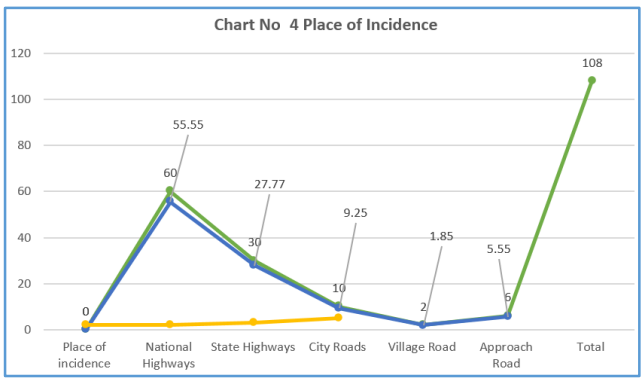
In this study, the incidence of injuries due to RTA was higher in males i.e. 98 [09.74%] and 10 [9.25%] in females. Female to male ratio is being 0:10. Males are the main bread earners in the Indian families, so they spend lots of their time in travelling and various outdoor activities, greater exposure on streets, so they are prone to accidents. These are similar to studies conducted by others.[3-6]



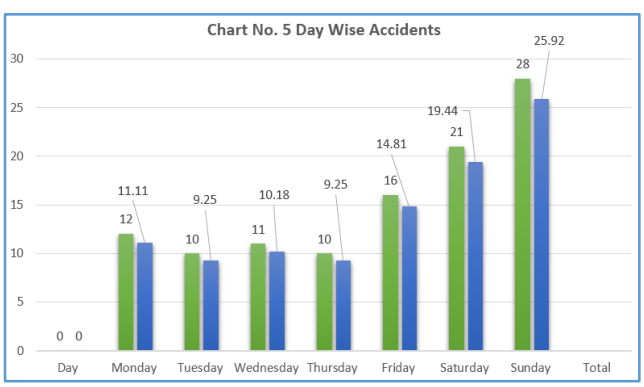
In the present study, the peak timing of occurrence of RTA was reported at 9 a.m. to 12 noon, 31 [28.70%]; followed by 6 am to 9 a.m., 18 [16.66%]; and next in 12 p.m. to 3 p.m., 17 [15.74%] cases. This is probably due to heavy and unequal distribution of incidents occur when rush is too heavy on road at these working hours which are consistent with other studies.[6,7,8]



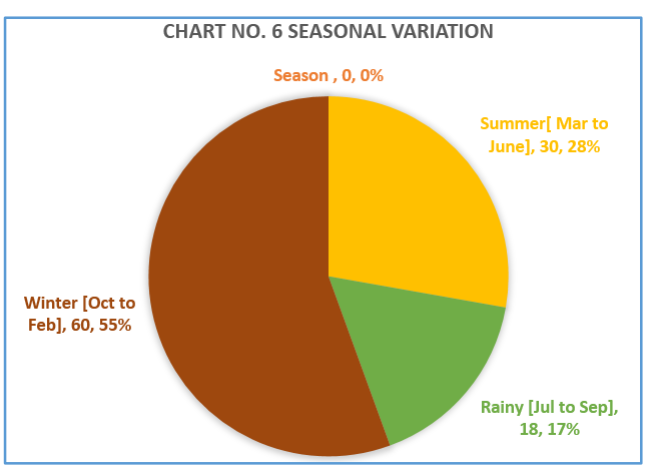
We observed that the highest number of RTA (60 [55.55%]) cases took place on national highways due to road traffic accidents followed by state highways (30 [27.77%]) and city roads (10 [9.25%]). The reasons for high incidence of accidents on the highways [national & state] and city roads might be these roads are busiest, very narrow, too much traffic during peak hours, no traffic signals at junctions, and no strict enforcement of road safety rules. These are similar to studies by other authors.[7,9.]



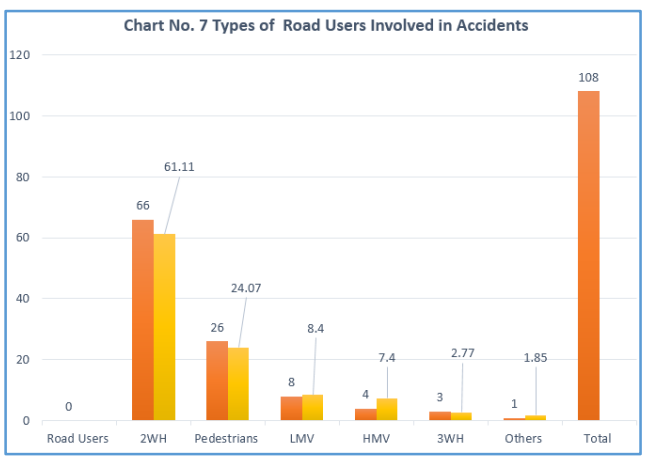
In the present study, the higher number of road accidents are occurring on weekends i.e. Fridays, Saturdays and Sundays at 16 [14.81%], 21 [19.44% and 28 [25.92%] respectively when compared to week days. Similar results were observed by authors.[9,10] The higher number of reported accident cases occurred on weekends when compared to week days due to soaring traffic density, traffic congestion, urge to reach destination in time, high people movements to place & house and failure to follow traffic rules & laws.



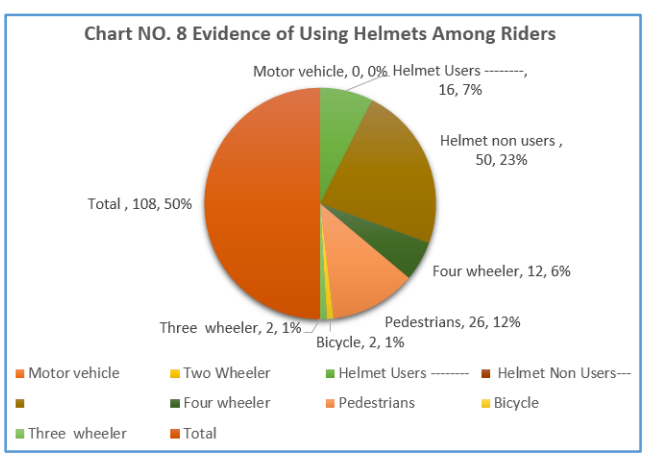
In this study, we observed that the highest number (60 [55.55%]) of cases were occurring during winter season followed by summer season (30 [27.77%]) and least (18 [16.66%]) cases occurred in rainy season. These are consistent with other authors.[6,11] The reason might be poor visibility to vehicle drivers leading to accidents in the early hours of day due to foggy weather conditions and slow reaction time due to extreme cold affecting both drivers and road users.



Types of road users involved in accidents in this study, maximum number of accidents (66 [61.11%]) were two wheeler type followed by pedestrian (26 [24.07%]) cases. These are consistent with studies by other authors.[7-15] Two wheelers are preferred transportation vehicles for vast Indian families as they are cheaper, give better mileage, carrying at least 2 to 3 passengers, easy to park & ride in traffic congestion. Two wheeler accidents contributed for nearly more than half of total RTA deaths, two wheeler users and pedestrians have the highest rates of fatal injuries. The reasons for high two wheeler accidents might be more vehicles on Indian traffic, vehicle vulnerability, poor road status, coupled with non-adherence of riders to road safety rules & traffic laws.

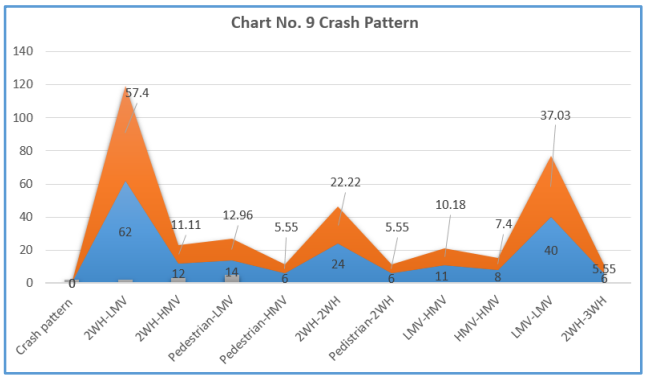


On use of helmets among riders, we observed that the highest (50) cases were non-users of helmet while riding two wheelers whereas helmet users were 16 cases. In two wheeler accidents, we noticed that most of the victims who died because of fatal head injury were non-users of helmets, which shows that the safety helmet can be lifesaving during the accident involving two wheelers.[6,9,11,14]

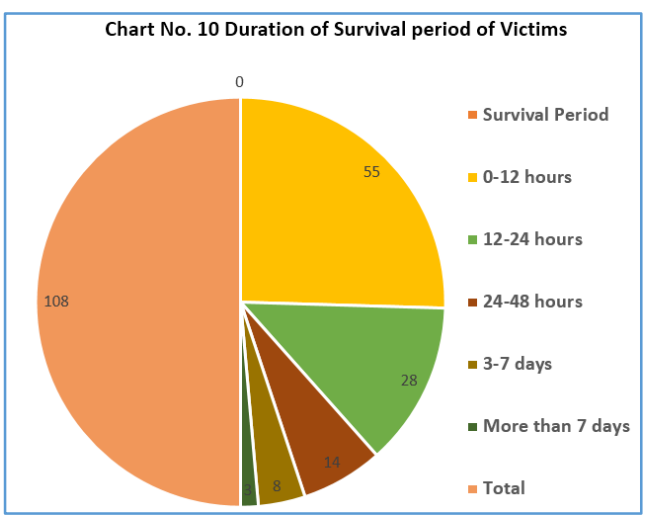


According to crash pattern, majority of cases (62 [57.40%]) were seen in two wheeler to LMV crash pattern followed by LMV to LMV (40 [37.03%]), next two wheeler to two wheeler hit cases (24 [22.22%]) and minimum cases (14 [12.96%]) seen in pedestrian to LMV crash pattern which are similar to studies by others. The two wheeler hit by the light motor vehicle was the most common type of crash in our study.

This might be due to the fact that the two wheelers are more affordable and are much more in number when compared with other vehicles.[7,9,15]



In our study, we found 83 [76.85%] of the victims of RTAs died either on spot, 39 [36.11%] or 44 [40.745] within one hour of the incidence and rest could survive for a couple of days to maximum of two weeks after getting good medical and surgical procedures. The time of survival of head injury victims varies as per the severity of trauma and also health care services provided to the patients. Similar observations are made by other authors.[9,14-20]



As per location of skull fracture, in our study, skull vault was fractured in 28% of cases, basilar fractures were seen in 40% of cases and in majority of cases [52%] both the vault and base were fractured or both, especially in the thin areas, temporoparietal bone. These are consistent with other studies.[7]

In our study, the dominant type of skull fracture found was fissured fracture in 53 [49.07%] cases followed by comminuted fracture in 28 [25.92%], next depressed fracture in 8 [7.40%] and least in 5 [4.62%] cases of basilar fractures. The presence of hinge fracture in 5.55% of cases and sutural fracture in 0.92% of cases, whereas in 6 [5.5%] cases no skull fractures are found in this study. These are consistent with studies by other authors.[17-20] The most frequent bone fractured was temporal bone (62 [57.40%]). The probable reason of multiple skull bone fractures is very high speed at which vehicles move on highways, so accidents which occur at high speeds cause a great impact on head when it strikes by forcible contact with a broad resisting surface.

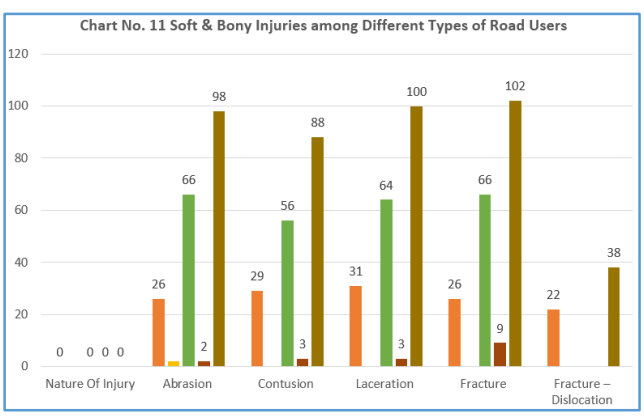
The commonest variety of intracranial haemorrhage found was subdural haemorrhage [SDH] (91 [84.25%]) followed by subarachnoid haemorrhage ([SAH] 68 [62.96 %]), Intracerebral haemorrhage ([ICH] 24 [22.22%]) and least is extradural haemorrhage [EDH] found in 16.6% cases which is supported by other studies also.[17-20]

With regard to pattern of injuries, musculoskeletal injuries topped the list of injuries of RTA in all age groups of victims, while injuries of head (93 [86.11%]), chest (32 [33.33%]), and abdomen (18 [16.66%]) injuries in motor cyclists were more frequent than other victims due to severe trauma to unprotected bodies. These were consistent with other studies.[15,18]

Victim Status	Pedestrians	Passengers	Drivers	Motor Cyclists
Injured System				
Head injuries	26 [24.07%]	5 [4.62%]	2 [1.85%]	60 [55.55%]
Chest injuries	24 [33.33%]	6 [5.55%]	3 [2.77%]	32 [29.62%]
Abdominal injuries	18 [16.66%]	7 [6.48%]	2 [1.85%]	25 [23.14%]
Musculoskeletal System				
Fracture [exclude rib frac]	25 [94.44%]	18 [16.66%]	43.70%]	55 [50.92%]
Several tendon injuries	16 [14.81%]	1 [0.90%]	1 [0.90%]	2 [1.85%]
Lacerated wound	20 [24.07%]	2 [1.85%]	1 [0.90%]	40 [37.03%]
Limb amputation	10 [9.25%]	1 [0.90%]	-	2 [1.85%]

Table 1. Pattern of Various Injuries Sustained in Vehicular Accidents

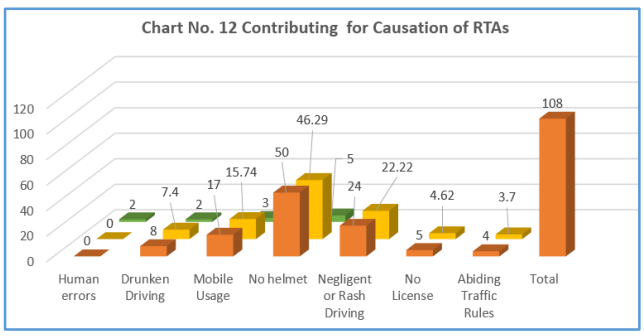
We found multiple injuries of soft tissue & bony injuries among different types of road users. Wounds are produced which are in combinations of abrasion, contusion, lacerations and fracture dislocation seen majority of cases. Similar findings are made authors.[6,7,8]



In this study, we noted first limbs and pelvis fractures are so frequent due to direct collision between vehicle and pedestrians body, second the victims are thrown off the air to ground leading to subsequent injuries where any part of the body liable to be injured, third the wheel of the vehicle can

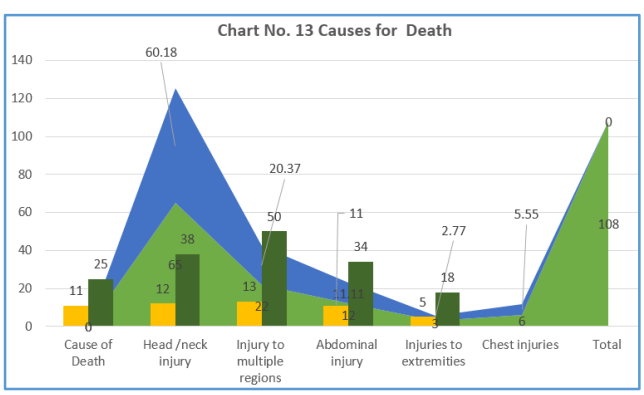
pass on the victims adding more injuries. So in pedestrians multiple injuries are the rule.

We observed that the human errors were the commonest contributing to accidents which include non-helmet users (50 [46.29%]) followed by rash driving (24 [22.22%]), next mobile usage 17 ([15.74%]) and minimum (8 [8.40%]) were drunken driving.[9] Too many factors [human, vehicular and roadways] contribute for causation of vehicular accidents and human errors are responsible for many fatalities.



In this study, 8 [7.40%] cases were under influence of alcohol intoxication. Driving a vehicle under intoxication is a crime, because alcohol intoxication impairs driving ability of a person and level of impairment is directly related to blood alcohol concentration.[8,21]

We found that RTAs associated with head/neck injury (38 [68.18%]) was the commonest cause of death in our study. Injury to multiple regions also responsible for cause of death in 22 cases which are consistent with studies conducted by authors.[6,8,22]



Recommendations

Human error was responsible for accidents due to over speeding, rash driving, loss of control, and violation of traffic rules, alcohol intoxication.

A national wide computerised trauma registry is required to bring out the risk factors, circumstances, chain of events leading to the accidents.

CONCLUSIONS

- The incidence is 14.06%.
- The commonest affected age group is 31-40 years.
- Male subjects were predominant.
- High number of cases occurred during winter season, on weekends.
- Highest number of cases occurred during day time, on the national highways.
- The commonest crash pattern was 2WH to LMV.
- The commonest road users are two wheeler riders followed by pedestrians.
- With regard to pattern of injuries, musculoskeletal injuries topped the list of injuries.
- We found multiple injuries of soft tissue & bony injuries among different types of road users.
- Most of the victims were non-helmet users at the time of incident.
- Commonest type of skull fracture is fissured fracture.
- Commonest type of intracranial haemorrhage is SDH.
- Most of the deaths takes place either on the spot or within 24 hours of injury.
- Human error is the most common cause of road traffic accidents.
- We hope that this study may be helpful in understanding of this problem.

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