Original Research Article

A Cross-Sectional Study on Pattern of Thoraco-abdominal Injuries in Victims of Fatal Road Traffic Accidents

Kapil Yadav[1], Devinder Kumar Atal[2], Hitesh Chawla[3], Renu Yadav[4], Mustafa Khan[5], Ravi Prakash Yadav[6]

[1]Senior Resident, Department of Forensic Medicine & Toxicology, SHKM Govt. Medical College Nalhar, Nuh, Haryana, India, [2]Professor and Head, Department of Forensic Medicine & Toxicology, SABV Govt. Medical College Chhainsa, Faridabad, Haryana, India, [3]Professor, Department of Forensic Medicine & Toxicology, SHKM Govt. Medical College Nalhar, Nuh, Haryana, India, [4]Junior Resident, Department of Obstetrics and Gynecology, SHKM Govt. Medical College Nalhar, Nuh, Haryana, India, [5]PG Resident, Department of Forensic Medicine & Toxicology, SHKM Govt. Medical College Nalhar, Nuh, Haryana, India, [6]Junior Resident, Department of Ophthalmology, SHKM Govt. Medical College Nalhar, Nuh, Haryana, India.

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Abstract

Background: Road traffic accidents are preventable public health issues and are becoming more common. These accidents can be linked to a number of factors, including an increase in the number of vehicles on the roads, changes in daily life, a nasty habit of breaking traffic laws, anarchic traffic systems, and risky driving practices. Thoraco-abdominal injury in different forms is one of the major causes of mortality in the victims of fatal road traffic accidents. The aim of this study was to know the pattern of thoraco-abdominal injuries in victims of fatal road traffic accident cases.

Material & Method: The present study was conducted at the tertiary healthcare centre in southern Haryana. Total of 75 cases of fatal road traffic accident cases were enrolled during one year of study period. The basic information about the deceased like age, gender, mode of travel of the victim was obtained from investigating officer narration and inquest papers. During autopsy, detailed examination of injuries was carried out and the autopsy findings were recorded and analyzed.

Results: It was observed that out of 75 cases male outnumbered females in ratio 5.25:1. Majority of the victims belonged to the age group 21-30 years. The commonest injury of the thoracic region was rib fracture (41.3%). It was also observed that 17.3% of victims had pelvic fracture.

Conclusion: Human error is a major contributing factor to fatal RTAs, which can be avoided in many cases. A more stringent licensing policy, particularly for four-wheelers, increased knowledge of traffic laws, the reduction of drug abuse and an appropriate road network that is in line with traffic volume can help to reduce the number of fatal road traffic accidents.

Keywords: Road traffic accidents; thoraco-abdominal injuries; rib fracture

Corresponding Author: Kapil Yadav, Senior Resident, Department of Forensic Medicine & Toxicology, SHKM Govt. Medical College, Nalhar.

E-mail: kapilthothwal@gmail.com

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Introduction

Accident is an episode, occurring out of the blue, unexpectedly and unintentionally under unforeseen situations. Amongst all transportation accidents, road traffic accidents tend to be the most severe problem worldwide; a counter product of modernization and fast life.[1] 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.[2]

Injuries and fatalities occur in all forms of transportation but numerically road traffic accidents account for the great majority worldwide, causing more than a million deaths annually and injuring about 20–50 million. If the current trends continue, road traffic injuries are likely to rise to the fifth leading cause of death by 2030. The pattern of injury, fatal and otherwise, varies significantly depending upon whether the victim is a vehicle occupant, a motorcyclist, a pedal cyclist or a pedestrian.[3]

Road traffic injuries are the eighth leading cause of death for all age groups. More people now die as a result of road traffic injuries than from HIV/AIDS, tuberculosis or diarrhoeal diseases. Road traffic injuries are currently the leading cause of death for children and young adults aged 5–29 years, signalling a need for a shift in the current child and adolescent health agenda.[4]

Since the thoraco-abdominal cavity contains the vital organs such as heart, lungs, liver, spleen, stomach, kidney, major blood vessels, and ribs, trauma to this region challenges the integrity and even the viability of the individual. It is a leading cause of death in approximately 25% of trauma patients and, when associated with other injuries, it causes death in additional 50% of multiple trauma patients.[5] The present study is an attempt to analyze the pattern of thoraco-abdominal injuries in autopsy cases with an alleged history of fatal road traffic accidents with regards to age, gender, mode of travel of victim, external and internal injuries sustained.

Material & Methods

The present study was a prospective, cross-sectional study. The study was conducted in the Department of Forensic Medicine of a tertiary care center of southern Haryana. Total of 75 cases of fatal road traffic accident cases were included during one year of study period. Bodies that were decomposed, unidentified and those with no specific history were excluded from the study. A Proforma was designed specifically for the study purpose. Basic information of the deceased such as age, gender, address, travel mode of the victim was obtained from the reporting of investigating officer and inquest papers. Each injury was recorded as per the involvement of body region viz. thorax, abdomen and pelvis. During autopsy, detailed examination of injuries was carried out and the autopsy findings were recorded on standard autopsy proforma and the information thus collected, was statistically analyzed.

Observations & Results

In our study, it was observed that out of 75 cases, 63 were male (84%) and 12 were female (16%), the males outnumbered females in ratio 5.25:1.

It was observed that individuals belonging to the age group 21-30 years were most affected in road traffic accidents (26.7%), followed by 31-40 years (20.0%). The age wise distribution of victims is depicted in Figure 1.

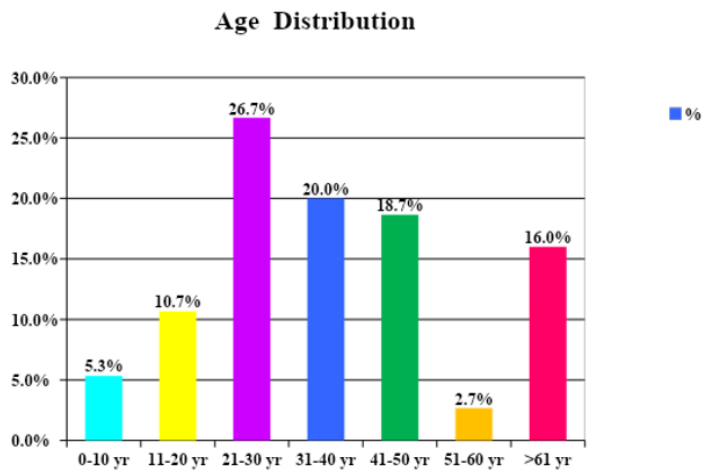

Figure 1: Bar diagram demonstrating the age distribution (%) of individuals involved in fatal road traffic accidents (n=75).

It was observed that motorcyclist / scooter occupants were most affected by RTAs comprising 65.3% cases followed by pedestrians (20%), light motor vehicle occupants (13.3.%) and least affected were heavy motor vehicle occupants (1.3%). (Figure 2)

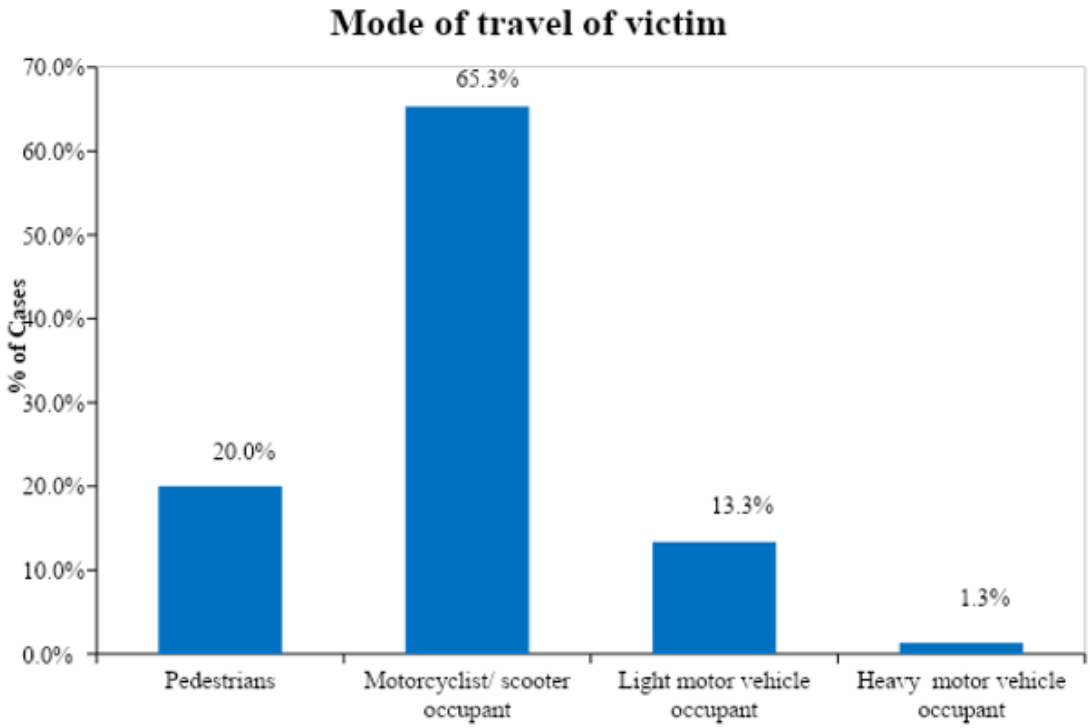

Figure 2: Bar diagram demonstrating the mode of travel (%) of the victims involved in fatal road traffic accidents (n=75).

It was observed that the maximum number of road traffic accidents occurred in the morning between 06:00-11:59 hours followed by accidents occurring between 12:00-17:59 hours and the least number of RTAs occurred at night between 00:00-05:59 Hrs. (Figure 3)

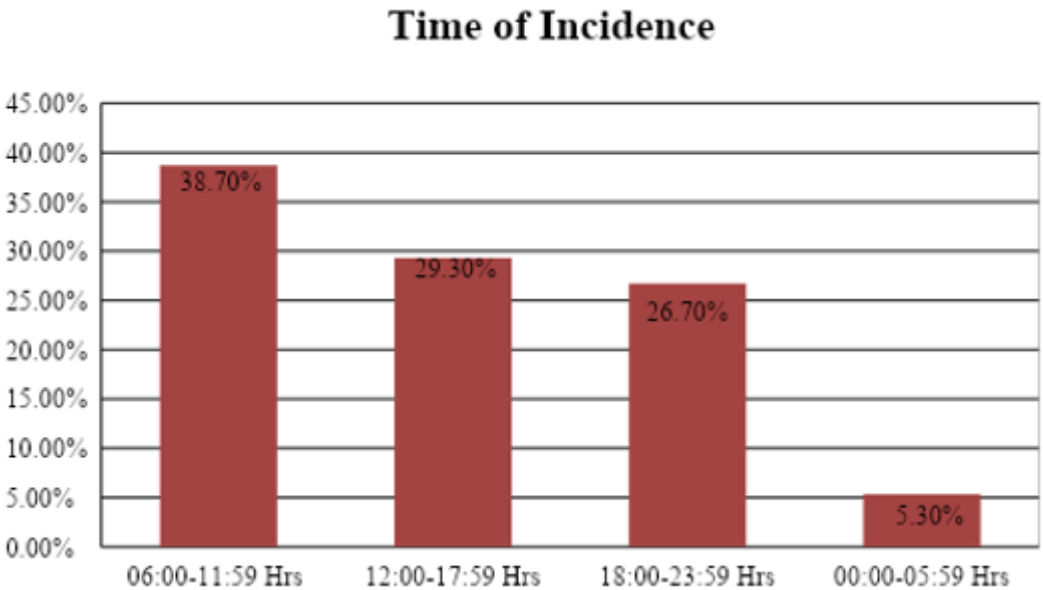

Figure 3: Bar diagram demonstrating the time of incidence (%) of fatal road traffic accidents (n=75).

It was observed that 70.7% of victims succumbed within 1-6 hours after a fatal road traffic accident, followed by 17.3% within $^{1}/_{2}$-1 hour and only 2.7% of the victims survived for more than 3 days. (Figure 4)

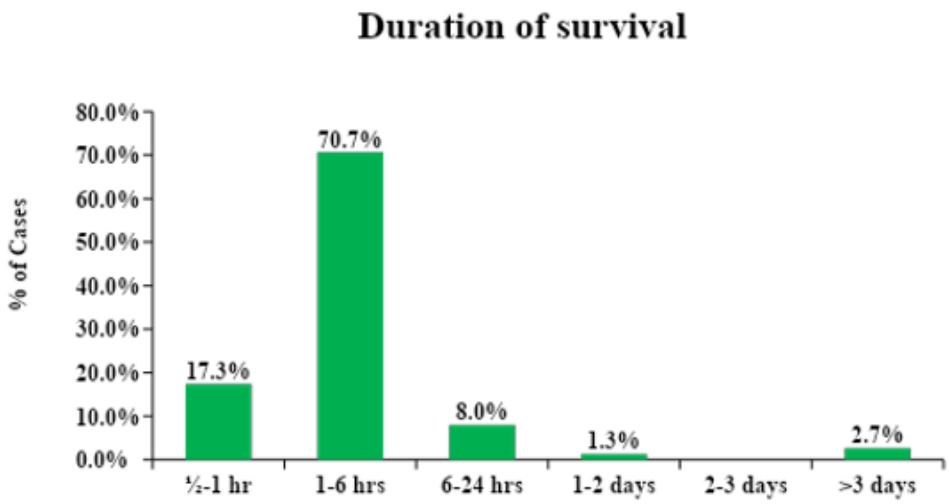

Figure 4: Bar diagram demonstrating the duration of survival (%) in the victims involved in fatal road traffic accidents (n=75).

Injuries over thorax were mainly abrasions (32.0%) and contusions (30.7%). However, the majority of abdominal injuries were abrasions (17.3%). Those who had injuries over pelvic region majority had contusions (9.3%), followed by abrasions (4.0%).

It was also observed that the commonest injury of the thoracic region was fracture of ribs (41.3%) followed by lung injuries (4.0%). Among the abdominal injuries commonest injury was injury to mesentery followed by liver injury (4.0%), injury to intestine (2.7%) and least injured was spleen. It was observed that 17.3% of victims of fatal road traffic accidents had pelvis fractures. (Figure 5)

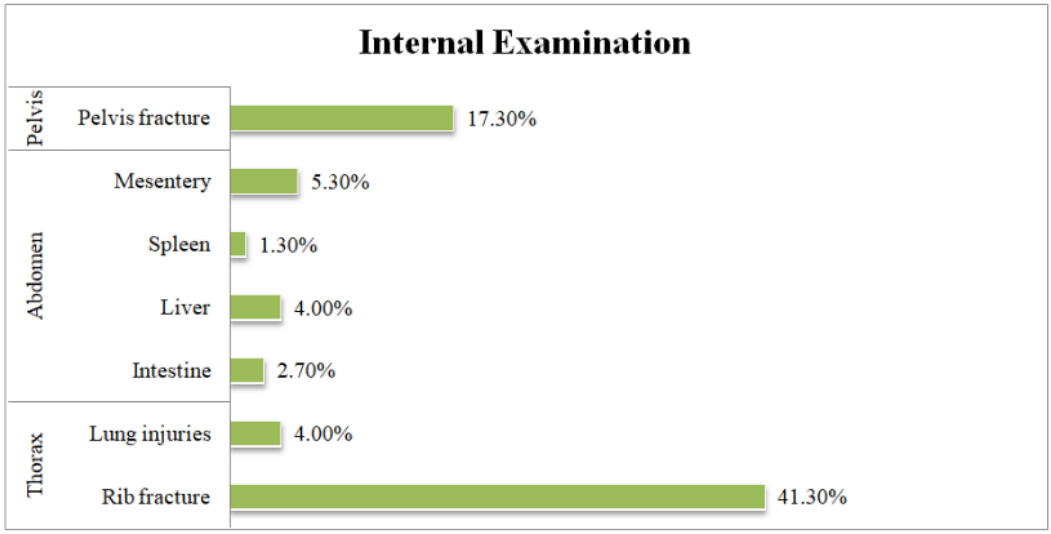

Figure 5: Bar diagram demonstrating the region of body involved and type of internal injury sustained (%) for the victims involved in fatal road traffic accidents (n=75).

Discussion

The number of deaths on the world's roads remains unacceptably high, with an estimated 1.35 million people dying each year. Road traffic injuries are now the leading cause of death for children and young adults aged 5–29 years. More than half of all road traffic deaths are among vulnerable road users; pedestrians, cyclists and motorcyclists.[4]

In our study a total of 75 cases that satisfied the inclusion and exclusion criteria were included and it was observed that out of 75 cases 63 were males (84%) and 12 were females (16%) and males outnumbered females in ratio 5.25:1. These findings are in general agreement with the studies conducted by Singh & Dhattarwal,[6] Rao & Mukerjee,[7] Verma et al.[1]

In road traffic accidents, people between the age group of 21-30 years were most affected (26.7%), followed by those between the age group of 31-40 years (20.0%) and 41-50 years (18.7%). People between the age group of 51-60 years (2.7%) were least affected. Additionally, it was observed that victims of RTAs in this area were often older people over 61 years. Their ignorance of traffic safety precautions may be the cause of the rise in fatalities. Since the age group of 21–30 years is the most socially and physically active, it outnumbers other age groups on the road. It was also observed that the majority of the cases (65.4%) lie within the economically productive age group of 21-50 years. These findings are in general agreement with the studies conducted by Singh & Dhattarwal,[6] Kiran et al.,[8] Dhillon et al.[9]

It was observed that, in 65.3% of cases, riders of motorcycles and scooters were the most affected by road traffic accidents, followed by pedestrians (20%), drivers of light motor vehicles (13.3%), and drivers of heavy motor vehicles (1.3%). The majority of victims in this study were riders of motorcycles or scooters, which makes sense given that most Indian family, prefer to travel by motorcycle or scooter. Since this is a rural area, most people who use the roads are either pedestrians or two wheeler riders. The findings of the present study are in general agreement with the study conducted by Dagar et al.,[10] Chourasia et al.[11] However, the findings are contrary to the study done by Khan et al.[12] as they observed that pedestrians were most commonly affected by fatal road traffic accidents.

It was observed that the maximum number of road traffic accidents occurred in the morning between 06:00-11:59 hours followed by accidents occurring between 12:00-17:59 hours and the least number of RTAs occurred at night between 00:00-05:59 hours. The reason for higher incidence in morning hours may be due to traffic rush as majority of the people travel for work, offices, school, etc These findings are in general agreement with the studies conducted by Murkey et al.,[13] Shruthi et al.[14] However, the findings of this study are contrary to the study done by Madhuvardhana et al.[15] as they found maximum number of road traffic accidents in evening hours.

In the present study, it was observed that 70.7% of victim succumbed within 1-6 hours after fatal road traffic accident, followed by 17.3% within $^{1}/_{2}$-1 hours, 8% within 6-24 hours, 1.3% within 24-48 hours and only 2.7% of the victim survived for more than 3 days. The higher incidence of early deaths may be due to inadequacy of early transport and management of trauma patients. These findings also reflect the severity of the injury where the majority of the victims succumbed in early hours. The findings of this study are in general agreement with the study conducted by Verma et al.[1] However, the findings of this study are contrary to the study done by Shruthi et al.[14] as they observed that the majority of victims survived for > 24 hours.

It was observed that the majority of the victims had multiple external injuries in the form of abrasions, lacerations, contusions and incised wounds over thoraco-abdominal region. Among the external injuries, abrasion was the most common injury, followed by contusions, lacerations and the least observed was an incised wound. The findings of this study are in general agreement with the study conducted by Abymon et al.[16] It was observed that the commonest injury of the thoracic region was fracture of ribs (41.3%) followed by lung injuries (4.0%). Among the abdominal injuries commonest injury was injury to mesentery followed by liver injury (4.0%), injury to intestine (2.7%) and least injured was spleen. It was also observed that 17.3% of victims had pelvis fracture. The findings of this study are in general agreement with the study conducted by Numan et al[17], However, the findings of this

study are contrary to the study done by Gushinge et al.[5] as they observed that among abdominal injuries the majority of victims had liver injuries followed by splenic injuries.

Conclusion

From the present study it was concluded that road traffic accidents were predominantly more common in males of age group 21-30 years; two wheelers' occupants followed by pedestrians were most vulnerable to road traffic accidents. In this study, thoracic injuries outnumbered the abdominal injuries in fatality. The study also showed that most road traffic accidents deaths, brought to a tertiary care rural hospital, took place within 6 hrs of injury which is indeed very alarming. Human error is a major contributing factor to fatal RTAs, which can be avoided in many cases. A more stringent licensing policy, particularly for four-wheelers, increased knowledge of traffic laws, the reduction of drug abuse and an appropriate road network that is in line with traffic volume can all help to reduce the number of fatal road traffic accidents.

Conflict of interest: None

Ethical approval: The study was approved by the Institutional Ethics Committee

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