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Profile of Internal Injuries to Thorax, Abdomen and Pelvis Sustained by the Victim During Fatal Road Traffic Accident in Central India

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ABSTRACT

Road traffic accident is a complex phenomenon. Constant rise in the number of motor vehicles, rampant encroachment of road, easy to avail the vehicle because of loan facility, nasty tendency of violating traffic rules and anarchic traffic systems have greatly contributed to rapid increase in RTAs. Population explosion is a catalyzing factor for a number of accidents. The rise of road traffic accidents has become a major public health problem. The injuries, disability and fatality resulting from unexpected RTAs put a significant drain on the economy of the nation. The present study was a cross-sectional study conducted in central India during 1.6 year period from 1st June 2014 to 1st Jan 2017. During the study period, a total of 757 medicolegal autopsies were conducted in this institute, out of which 109 cases of fatal road traffic accidents (died on spot or within 24 hours of accident) were studied. The purpose of the study was to know the pattern of injuries in victims of fatal RTAs and to establish the correlation between the injury and the cause of death.

Keywords: *Fatal road traffic accident, Head Injuries, Thoracic injuries, Shock, death.*

INTRODUCTION

Accidents are world's most serious health problem. Road Traffic Accident (RTA) is any vehicular accident occurring on the roadway (i.e. originating on, or involving a vehicle partially on the roadway)[9]. This includes collision of an automobile with a pedestrian, another automobile or with a non-automobile on the roadway or fall from a moving vehicle causing injuries or death of involved individuals.

In recent years, death due to RTAs are increasing at an alarming rate throughout the world. Thereby it poses itself as a major epidemiological as well as medico legal problem. This is due to the tremendous increase in the number of vehicle, high speed technology along with other contributing factors like congestion and poor condition of roads, intoxicating influence of alcohol or drugs, inexperienced drivers without proper driving license, ignorance or intentional violation of traffic rules etc. Victims in RTAs sustain large varieties of injuries, external as well as internal. External injuries may be abrasions, lacerations, contusions etc. Internal injuries may be fractures, rupture of viscera, destruction of major arteries etc. Fatality in RTAs can be due to immediate cause like hemorrhage, injury to vital organs, vagal inhibition, neurogenic shock, embolism etc.

According to an expert study group appointed by Government of India "RTAs have come to be considered as the third deadly killer, next to heart disease and cancer." Every year the World Health Organization (WHO) hosts an event, usually on 7th April, to celebrate the anniversary of its founding in 1946. Each year the event focuses on one health issue. In response to a growing concern about RTAs the WHO Director-General, Dr. Lee Jong Wook has for the first time in history of WHO devoted 7th April 2004 specifically to road safety and the slogan was "Road Safety Is No Accident." Early detection of the injury and prompt treatment are necessary in saving the lives of many of these victims.

AIMS AND OBJECTIVES

1. To make a detailed study of the internal injuries to the thorax, abdomen & pelvis.

2. To analyze the cause of death due to fatal road traffic accident brought to mortuary of our institute for post - mortem examination with respect to the above injuries.

MATERIALS AND METHOD

The present study was a two year cross–sectional study. The material for the study was the cases of road traffic accidents brought to mortuary for post mortem of this institution situated in central India, during the period from 1st June 2014 to 31st May 2016.The present study includes documenting types of wound, their anatomical location and commonest injuries leading to death in fatal road traffic accidents. Ethical clearance for the present study was obtained from the institutional ethical committee.

On the arrival of the case in Mortuary of this institute, informed expressed consent was taken from the relative of deceased for examination of wound and their documentation. In the present study, detailed information regarding the wounds and various factors regarding the circumstances of the occurrence, like type of road traffic accidents, time and place of accidents, who treat case first, occupation and other relevant information were gathered from relative and were recorded in the predefined proforma. In addition to these, X-ray or CT scan reports were examined for the presence or absence of fracture. In mortuary consent was obtained from relative for examination and medico legal documentation was done in the predefined proforma.

Details of name, age, sex, address, occupation, type of accident etc. were recorded from relative. All the wounds were examined for their location, size and shape. All the fractures were examined by palpation for crepitus, deformity, shortness of limb and by X-ray/CT scan. In the present study though the size of all wounds were noted but it is not included in the analysis because it is beyond the preview of present study.

During the present study period from 1st June 2014 to 31st May 2016 at this institute in central India–

1. Total no of medicolegal autopsies were conducted during the study period = 757.
2. Autopsies of fatal road traffic accident (died on spot, brought dead to hospital or died within 24 hours of accident) = 109.

Inclusion Criteria: All the victims of road traffic accidents who were died on spot or brought dead to hospital or died within 24 hours of accident.

Exclusion Criteria:

1. All the victims who died in an incidence other than road traffic accidents.
2. All the victims of road traffic accidents who were died after 24 hours of accident.

Statistical Analysis:

1. The software for graphs and calculation of statistical values is – SPSS
2. The software used during creation or modification of some of the diagrams
   a. ADOBE PHOTOSHOP(R) 7.0
   b. COREL DRAW X3
   c. WINDOWS -10

RESULTS

Table 1: Profile of distribution of internal injuries in Thorax

Internal injuries on Thorax	No. of cases	Percentage
Rib fracture	32	29.36%
Lungs	16	14.68%
Heart	01	00.92%
Diaphragm	01	00.92%
Thoracic vertebra fracture	01	00.92%

Table 2: Profile of distribution of internal injuries in Abdomen and Pelvis

Internal injuries on Abdomen	No. of cases	Percentage
Stomach and intestine	02	01.83%
Liver	24	22.02%
Spleen	02	01.83%
Kidney	01	00.92%
Lumbar vertebra	01	00.92%
Sacral vertebra	01	00.92%
Bladder	01	00.92%
Genitalia	01	00.92%
Pelvis	04	03.67%

Table 3: Profile of cause of death

Cause of death	No. of cases	Percentage
Intracranial injuries (intracranial hemorrhage/ brain injury)	86	78.90%
Hemorrhagic shock	17	15.60%
Traumatic asphyxia	04	03.67%
Spinal cord injury	02	01.83%
Total	109	100%

DISCUSSION

Profile of Internal injury in Thorax (Table 1): In the present study, out of total 109 cases internal injuries in thorax were seen in 33 cases. Injuries in thorax were classified as rib fracture, lung injury, injury to heart, injury to diaphragm and thoracic vertebra fracture. Rib fracture was seen in 32 cases (29.36%) followed by injury to lung in 16 cases (14.68%) and minimum were injury to heart, injury to diaphragm and injury to fracture thoracic vertebra in 01 case (00.92%) respectively. Most of the lung injuries were associated with rib fracture. All the cases involving heart, diaphragm and thoracic vertebra shows fracture of rib. The findings of present study are similar to studies done by Gupta S, Roychaudhary UB et al at North Bengal,[4] except in injuries associated with rib fracture. The findings of our study are also comparable with the finding of study done by Singh H, Dhattarwal et al at Rohtak Haryana.[8] The finding of our study and study done by Suresh Kumar Shetty[7] are nearly similar 30% and 27% respectively.

Blunt force trauma to the chest can damage the organ without damaging the thoracic wall. Thoraco-abdominal involvement in the RTA can be related to the anatomical location of this region that makes it easily susceptible to impact in any form of blunt force trauma.

Profile of internal injuries in Abdomen and Pelvis (Table 2): In the present study out of total 109 cases the internal injuries in abdomen and pelvis were seen in 26 cases. The abdominal injuries were classified as stomach & intestine, liver, spleen, kidney, lumbar vertebra and pelvis. Amongst them injury to liver was maximum seen in 24 cases (22.02%) followed by injury to pelvis fracture hip bone 04 cases (03.67%), injury to stomach & intestine and spleen in 2 cases (01.83%) respectively and injury to kidney, lumbar vertebra, sacral vertebra, bladder and genitalia in 01 case (00.92%) each. The findings of our study are comparable with study done by Chaudhary B L, Tirpude BH et al at Mahatma Gandhi Institute of Medical Sciences Sewagram Wardha,[2] Gupta S, Roychaudhary U B et al at North Bengal region[7] and NB Kumar, PS Ghormade et al at IGMC Nagpur.[6]

The findings of our study 23.85% of abdominal injuries are correlated with the study carried out by Chandra et al,[1] who observed 22.52% of abdominal injuries in their study at Delhi. The finding of our study are correlated with the study carried out by Tirpude BH et al[17] who observed 26.25% of abdominal injuries in their study at MGIMS Sewagram, Wardha. The finding of our study injury to the liver correlates with the study done by Chandra J, Dogra TD et al New Delhi,[1] Ghosh PK[3] and Honnungar RS, Aramani SC et al.[5]

Profile of cause of death (Table 3): In our study cause of death was intracranial injuries 86 (78.90%) in maximum number of cases. Next to intracranial injuries was hemorrhagic shock seen in 17 cases (15.60%), traumatic asphyxia in 4 cases (03.67%) and spinal cord injury in 2 cases (01.83%). The finding of present study are similar to studies [11, 10, 2, 12, 14.] In the study conducted in Finland involving RTA during the period 1972 to 1982,[15] in which an injury to cervical spine was the main cause of death. Increasing age seems to increase the risk of fatal cervical spinal injuries. Patients between 16 to 25 years of age had the lowest risk and the patient over the age of 60 years had the highest risk of sustaining a fatal cervical spinal injury [13.] Accordingly in our study most of the cervical spinal cord injury cases were above 40 years.

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Conflict of Interest: Nil

Summary and Conclusion:

1. The most common injury in thorax is rib fracture seen in 29.36 % of cases followed by lung injury in 14.68 % cases.
2. The most common organ involved in abdomen & pelvis is liver in 22.02% of cases.
3. The most common cause of death is intracranial injury in 78.90 % of cases.

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