

PATTERN OF HEAD INJURIES IN FATAL ROAD TRAFFIC ACCIDENTS IN INDORE REGION, M. P.R. K. Chaturvedi¹, Abha Mishra², Praveen Chaturvedi³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Road traffic accident is the leading cause of serious injuries with associated head trauma especially in youth and middle age persons. Head injury is the most common cause of mortality and major health problem all over the world. The Incidence of RTAs was higher in males and in 3rd to 4th decade of life owing to increase risk exposure to males due to more outdoor activities. Incidence of deaths due to RTAs was maximum (45.67%) in two wheeler riders followed by pedestrians in 33.33% cases. The present study was conducted on dead bodies, died of accidents involving two wheeler, four wheeler and bicycle. The rate of incidence is higher in India because of bad traffic patterns and possibly the lack of awareness about traffic rules and also lack of good hospital services to our victims of RTAs.

KEYWORDS: RTA, Head Injuries, Autopsies, Road Safety.

INTRODUCTION: Road accidents have earned India a dubious distinction. With over 130,000 deaths annually, the country has overtaken China and now has the worst road traffic accident rate worldwide. Total numbers of deaths every year due to road accidents have now passed 1,39,091 victims in India, according to the latest report of National Crime Records Bureau (NCRB), a total of 1,18,533 males and 20,205 females were killed during the year 2012.¹ Now road traffic accidents are the major cause for sudden un-natural deaths, India accounts for about 10% of road accidental fatalities worldwide, 85% of all road accident deaths occurring in developing countries and nearly half in the Asia-pacific region.²

Injuries due to RTA depend upon a number of factors such as human errors, driver fatigue, poor traffic sense, poor road condition, mechanical fault of vehicle, violation of traffic rules, traffic congestion, and road encroachment etc.³

Head injuries following the road traffic crashes (RTCs) are the most common cause of morbidity and mortality in most developed and developing countries and may also result in temporary or permanent disability or ultimately death of the victim.

The main purpose of this study is to assess the pattern of head injuries in RTA victims including both epidemiological and pathological features.

MATERIAL & METHODS: The present study was conducted on dead bodies, died of accidents involving two wheeler, four wheeler and bicycle, in the department of Forensic Medicine, SAIMS, Indore, M.P. India in year 2010-2012. Total '129' cases of head injury deaths were reported and brought to mortuary directly from the spot or from causality and ICU department or from neurosurgery department for medicolegal autopsy examination and out of these, 81 cases of RTAs (62.79%) were selected for the present study.

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Inquests, first information reports, statements made by the relatives, panchanamas are collected from police and relatives are enquired about some more information which are not incorporated in the above documents, when they attended mortuary at the time of post mortem examination. Further, the epidemiological and pathological data were obtained in all cases with reference to scalp injury, pattern of skull fractures and intracranial hemorrhages.

After collecting the above information, a data sheet is prepared; analyses and tabulated. These observations were made out and compared with the standard information available in the literature from other parts of India.

RESULTS: Total '129' cases of fatal head injury were reported during the period of study and out of these, 81 cases (62.79%) were of RTAs, 31 cases (24.03%) were of fall from height, 4 cases (3.10%) of homicidal assault and rest 13(10.07%) cases of other traumas. Males were more prone to death by RTAs (82.71%) as compared to females (17.28%) making male to female ratio of 4.78: 1. Incidence of RTA was more in third (28.35%) and fourth decade (19.40%) as compared to both extremes of life. The peak timing of road traffic accidents were either in morning hours of 6AM - 9 AM or during office or school going time between 9AM -12 noon.

Incidence of deaths due to RTAs was maximum (45.67%) in two wheeler riders followed by pedestrians in 33.33% cases, whereas four wheeler were involved in 17.28% cases and bicyclists in only 3.70% cases.

Many types of skull fracture were found that include linear fissured fracture in 40.74% cases, followed by basilar fracture in 18.51% cases, comminuted fracture in 8.64%, crush fracture in 6.17% and depressed fracture were found in 4.93% cases. In rest cases (20.98%), no skull fracture was found.

The incidence of sub-dural hemorrhage (SDH) was maximum (90.12% cases) followed by sub-arachnoid hemorrhages (SDH) in 82.71% cases, intra-cerebral hemorrhages in 19.75% cases and extracellular hemorrhages in only 3.58% cases.

We observed that all cases of EDH were found in association with SDH. In 38.27% cases the head injury was so severe that the victim could not survive after 12 hours of the incidence and most of them died either on the spot or on the way to hospitals, only 8.64% could survive up to 3 -7 days and 11.11% could survive more than 7 days following the intervention of surgical procedure and ICU care given to patients.

DISCUSSION: Head injury is the most common cause of mortality and major health problem all over the world. Road traffic accident is the leading cause of serious injuries with associated head trauma especially in youth and middle age persons.^{2,3} In present study also RTAs are the major cause of deaths due to head injury in 62.79% cases similar to others studies done by different authors.³⁻⁵

The Incidence of RTAs was higher in males and in 3rd to 4th decade of life owing to increase risk exposure to males due to more outdoor activities, which is similar to most of the studies done by various forensic pathologists.³⁻⁶ In our study motorcyclists followed by pedestrians were the majority victims; collectively accounting for 79% of the road traffic fatalities. Some other authors reported that the pedestrians were the major victims followed by motorcyclists in their studies.^{5,6}

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It might be because of different sample size and different distribution of vehicle types and pedestrians over the road. Drivers and passengers of four wheeler vehicles have been reported to be the next vulnerable category of victims in this study.

The peak timing of occurrence of RTAs was reported at 6 AM to 9AM and 9 AM to 12 Noon in this study, which is probably due to heavy and unequal distribution of traffic (heavy vehicles like trucks and buses are allowed in no entry area in morning and office and school time schedule exist from 9AM to 12 noon) at these working hours of time. Some studies have reported that the peak time of occurrence of road traffic accidents was in morning as well as in evening when rush was too heavy on the road, which is not fulfilled under our study.⁷

Most of victims of fatal head injury were having linear fracture of either skull vault (40.74%) or base of the skull (18.51%), or both, especially in the thin areas of temporo-parietal bone. There was no skull fracture found in 20.98% cases with or without brain injuries. The Incidence of subdural hemorrhage (SDH) and subarachnoid hemorrhages (SAH) was 90.12% and 82.71% respectively in the victims of RTAs while Extradural hemorrhage (EDH) was observed in 13.58% cases only, which is supported by other studies also.^{3,4,8}

The time of survival of head injury victims varies as per the severity of trauma and also health care services provided to the patients. In this study, we found that 61.72% of the victims of RTAs died either on the spot or within 24 hours of the incidence and rest could survive for a couple of days to maximum of two weeks after getting good medical and surgical procedures, which is similar to other studies.^{3,4,9,10} Glasgow Coma Scoring of head injury at the time of presentation to the Emergency Department is an important prognostic factor and the level of consciousness should be determined and monitored regularly in all such patients who survive in RTAs.

CONCLUSION: Road traffic accidents with head injuries are much more common in young working males as compared to females and that to in those who were pedestrians and motor cyclists. The rate of incidence is higher in India because of bad traffic patterns and possibly the lack of awareness about traffic rules and also lack of good hospital services to our victims of RTAs.

Finally more studies and research must be done in reference to RTAs to provide better understanding of epidemiology of RTAs of Indore region, MP and how mortality and morbidity may be reduced by RTAs in future, be further studied. In the mean-time, we hope that this study may be helpful in understating of this problem and will contribute in some way in RTAs cases at national level.

Observation Tables:

External Cause	No. of Cases (Percentage %)
RTAs	81 (62.79%)
Fall from height	31 (24.03%)
Homicidal Assault	04 (03.10%)
Others	13 (10.07%)
Total	129 (100%)

Table 1: Distribution of Head Injury Cases as Per Different Causes

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Age Group (In years)	Male	Female	Total Cases (Percentage %)
1-10	05 (7.46%)	03 (24.42%)	08 (09.87%)
11-20	08 (11.94%)	01 (07.14%)	09 (11.11%)
21-30	19 (28/35%)	01 (07.14)	20 (24.69%)
31-40	13 (19.40%)	03(24.42%)	16 (19.75%)
41-50	10 (14.92%)	02(14.28%)	12(14.81%)
51-60	04 (5.97%)	03(24.42%)	07 (08.64%)
Above 60	08 (11.94%)	01(07.14%)	09 (11.11%)
Total	67 (82.71%)	14 (17.28%)	81 (100 %)

Table 2: Age and Sex Wise Distribution of Road Traffic Accidents

Motor Vehicle	Number of Cases (Percentage %)
Four Wheeler	14 (17.28%)
Two Wheeler	37 (45.67%)
Bicycle	03 (03.70%)
Pedestrian	27 (33.33%)
Total	81 (100%)

Table 3: Distribution according to Types of Vehicles

Time of Incidence	No. of Cases (Percentage %)
0-3 AM	01 (01.23%)
3-6 AM	03 (03.70%)
6-9 AM	13 (16.64%)
9AM-12 Noon	17 (20.98%)
12-3 PM	09 (11.11%)
3-6 PM	11 (13.58%)
6-9 PM	21 (25.92%)
9-12 AM	06 (07.40%)

Table 4: Distribution according to Time of Incidence

Types of Skull Fracture	No. of Cases (Percentage %)
Linear Fracture	33 (40.74%)
Basilar Fracture	15 (18.51%)
Comminuted Fracture	07 (08.64%)
Crush Fracture	05 (06.17%)
Depressed Fracture	04 (04.93%)
No Fracture	17 (20.98%)
Total	81 (100%)

Table 5: Distribution according to Type of Skull Fractures in Victims

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Types of Intracranial Hemorrhages	No. of Cases (Percentage %)
Extradural Hemorrhage	11 (13.58%)
Sub- dural Hemorrhage	73 (90.12%)
Sub- arachnoid Hemorrhage	67 (82.71%)
Intra- cerebral Hemorrhage	16 (19.75%)

Table 6: Distribution according to Type of Intra Cranial Hemorrhages

Duration of Survival	No. of Cases (Percentage %)
0-12 Hrs.	31 (38.27%)
12-24 Hrs.	19 (23.45%)
24-48 Hrs.	07 (08.64%)
3-7 days	15 (18.51%)
>7 days	09 (11.11%)
Total	81(100%)

Table 7: Distribution according to Duration of Survival of Victims

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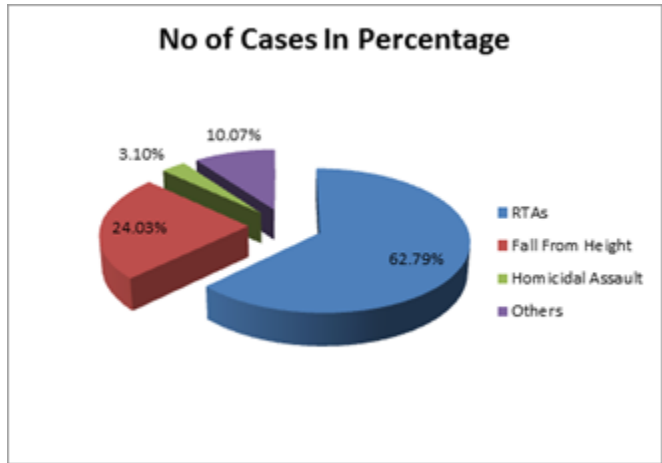


Chart No.1: Distribution of Head Injury Cases as Per Different Causes

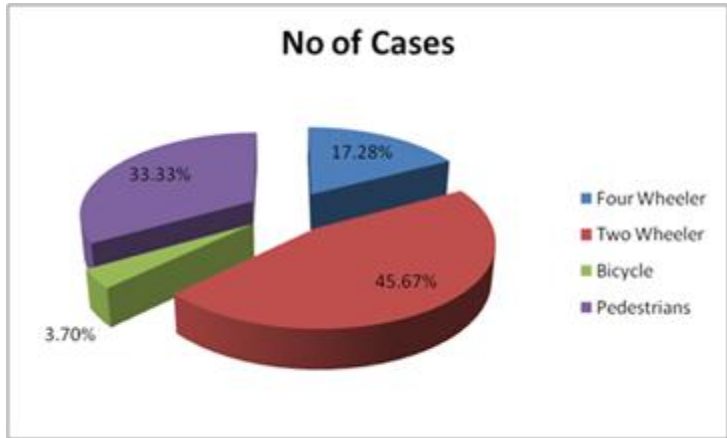


Chart No.2: Distribution according to Types of Vehicles

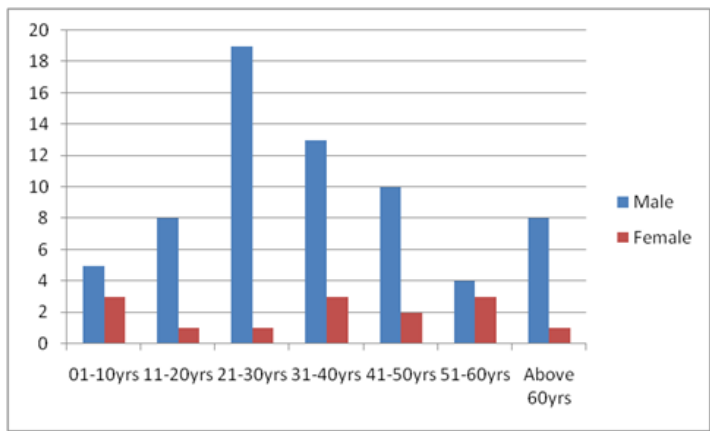


Chart No. 3: Age and Sex Wise Distribution of Road Traffic Accidents

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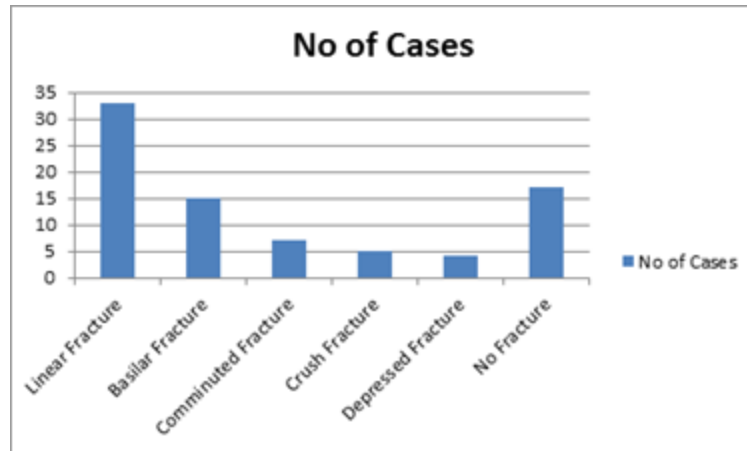


Chart No. 4: Distribution according to Type of Skull Fractures in Victims

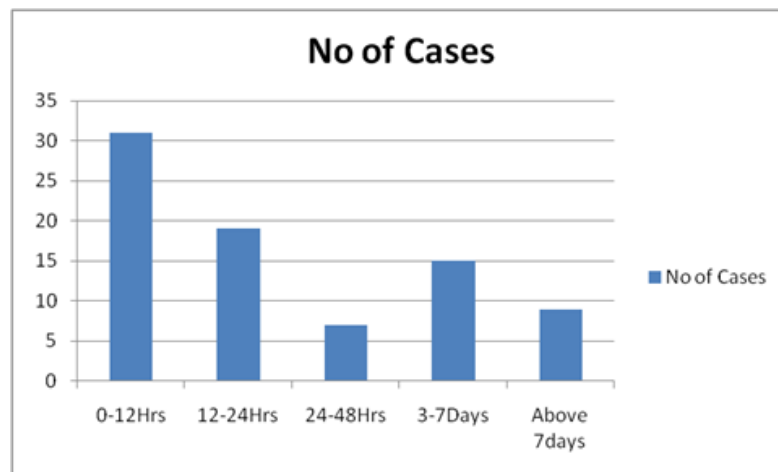


Chart No. 5: Distribution according to Duration of Survival of Victims

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