Content available at: https://www.ipinnovative.com/open-access-journals

IP International Journal of Forensic Medicine and Toxicological Sciences

Journal homepage: http://www.ijfmts.com/

Original Research Article

Head injury & road traffic fatalities-An analytical study of road traffic accident deaths

Dinesh Rao[1,*], Ananya[1], Meva[1]

[1] *Dept. of Forensic Medicine, The Oxford Medical College, Hospital & Research Centre, Bengaluru, Karnataka, India*

ARTICLE INFO

Article history:
Received 13-07-2022
Accepted 25-08-2022
Available online 15-10-2022

Keywords:
Head Injuries.
Road Traffic Accidents.
Road Traffic Fatalities
Open Head Injury. Motor Cyclist
Pedal Cyclists
Pedestrians
Light Motor Vehicle
Heavy Motor Vehicle

ABSTRACT

Introduction: Head injuries are the most commonly reported cause of Fatalities in majority of the Road Traffic Accidents.
Materials and Methods: This retrospective study was carried out at Oxford Medical College,Bangalore during the period 2012-2021. All Autopsy Reports on Road Traffic Fatalities, along with Hospital Records were closely studied, Documented and Analyzed.
Aims & Objectives: To study the Road Traffic Fatalities and Head Injuries Associated with it, besides the Age and Sex Group Involvement in Road Traffic Fatalities.
Results: Head Injuries Contributed to 58.7% of Road Traffic Fatalities. Open Head injuries Formed the Major Type of Injuries in 92% of Fatalities. Motor cyclists Accidents Contributed to 90% of the Head Injuries. Males Contributed to 81.97% of the Deaths.

1. Introduction

Road Traffic Accidents contribute to large number of Fatalities in the World. According to WHO, every year 1.3million people lose their lives as a result of Road Traffic Accidents.Head injury is a well-known cause of mortality worldwide, due to itsWeight, Mobility and Eccentric Position making it more Vulnerable in all Road traffic accidents. This Fatalities causes Sudden economic losses to their families, and to nations as a whole. WHO has estimated that Road traffic crashes cost most countries 3% of their gross domestic product.

WHO has stated that Correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries. WHO responded to this Global Menace with an objective to support Member States in road safety policy planning, implementation and evaluation.

WHO also collaborates with partners to provide technical support to countries. In 2017, it released Save LIVES a road safety technical package which synthesizes evidence-based measures that can significantly reduce road traffic fatalities and injuries.

For the Global Mortality due to Road Traffic Accidents India contributes to 10% of Road Traffic Fatalities and Head injuries account for one quarter to one third of all accidental deaths.[1] The Recent Advancement in the Car Design and Safety precautions by the Car Manufacturers have not only alerted the Passengers and Drivers prior to accident but also help prevent fatalities during the Crash moments, the Adapting of Air bags, Automatic Speed controls, Automatic collision warning, Braking, Anti roll over's, Driver State Warning & Communication system all have mitigated the Road Traffic Crash Fatalities.[2,3]

Hence, this Study not only Highlights the Importance of Studying Head Injuries in road Traffic Fatalities but also have made a Honest Effort in understanding the

* *Corresponding author.*
E-mail address: drraoforensic@yahoo.com (D. Rao).

https://doi.org/10.18231/j.ijfmts.2022.018

Relationship of Head injuries and Road Traffic Fatalities.

2. Aims & Objectives

1. To Study the Road Traffic Fatalities with Respective to Head Injuries
2. To Study the Different type of Road Traffic Fatalities and its relation to Head Injuries.
3. To the Study the Contribution of Age and Sex group to Head Injuries in road Traffic Accidents.

3. Materials & Methods

This Retrospective Study was conducted between the period 2012 to 2021. All Road Traffic Accident Fatalities brought to the Forensic Medicine Department in Sapthagiri Medical College & Oxford Medical College Bangalore, were Examined and the Fatal injuries pertaining to the Part of the Body affected were Categorized with particular reference to the Head injuries were studied in detail. besides the Age and Sex Group and Type of Victims and Type of Accidents were also noted and analyzed. the data thus obtained were carefully analyzed and compared with other studies done else where.

4. Observations

Total Number of Autopsies during the period of Study were 2368, of which Road Traffic Fatalities contributed to 1204 (51%) cases. This Retrospective Study was carried out during the period 2012-2021.

Motor Cyclists contributed to 416 Deaths. Pedestrians contributed to 76 Deaths. Pedal Cyclists contributed to 38 Deaths. Light Motor Vehicle Contributed to 383 Deaths. Heavy Motor Vehicles Contributed to 291 Deaths. Males contributed to 986 Deaths. Females Contributed to 218 Deaths.

The Major Age Group affected were between 21-40yrs in 54.9%(n-662) of cases, followed by those belonging to the age group 1-20yrs in 26.6%(n-320) of the cases. the least affected were those belonging to 60-80yrs of age contributing to 3.4%(n-41) of cases. Victims belonging to 40-60yrs contributed to 15%(n-181) of the cases.

A Total of 1204 cases of RTA Fatalities were Examined. Head Injuries Contributed to 672 Fatalities. Abdominal Injuries contributed to 142 Fatalities. Limb injuries contributed to 208 Fatalities. Chest Injuries Contributed to 182 Fatalities. Different type of Road Accidents were Observed. Motor cyclists sustained Head injury in 374(90%) cases out of 416 Deaths. Pedestrians Sustained 30 [40%]. Head injuries out of 76 Fatalities. Light Motor Vehicle Accidents contributed to 84 cases[22%] of Head injuries Fatalities out of 383 Fatal Crashes. Heavy Motor Vehicles contributed to 41[14%] Head injury Fatalities out of 291 Fatalities. Pedal Cyclists sustained Head Injury in 29 Cases[76%] out of 38 Fatalities reported.

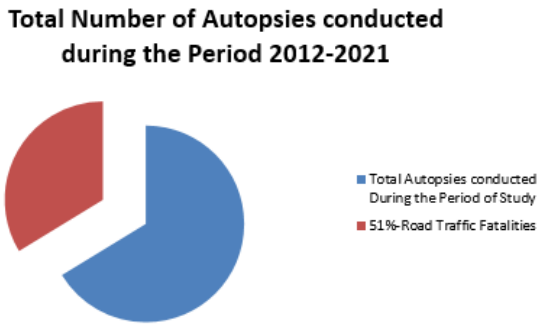

Fig. 1: Indicates thetotal number of autopsies conducted during the period of study. Road traffic fatalities contributed to 1204 (51%) cases.

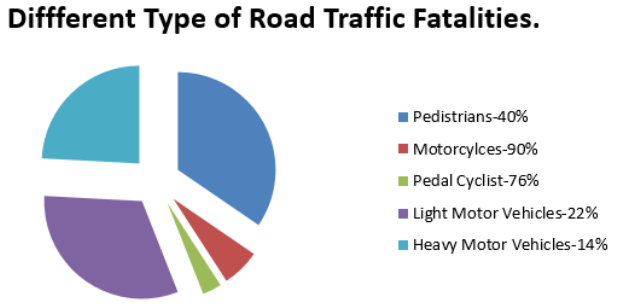

Fig. 2: Different type of road traffic fatalities reported during the period of study.

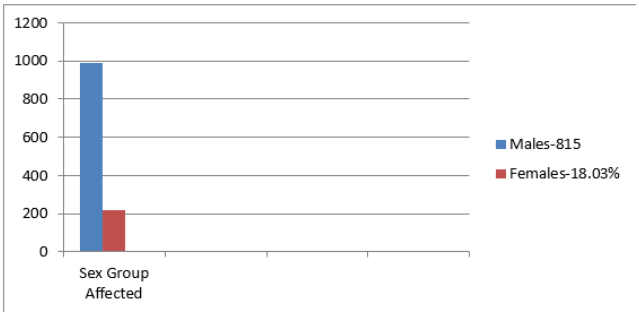

Fig. 3: Sex group affected.

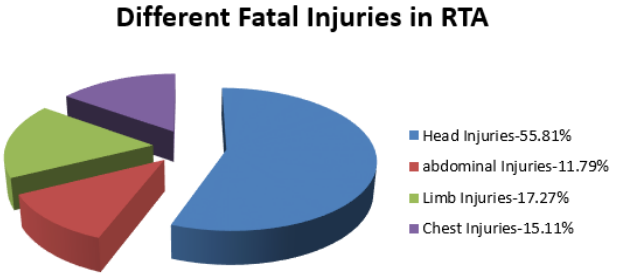

Fig. 4: Different type of fatal head injuries in RTA.

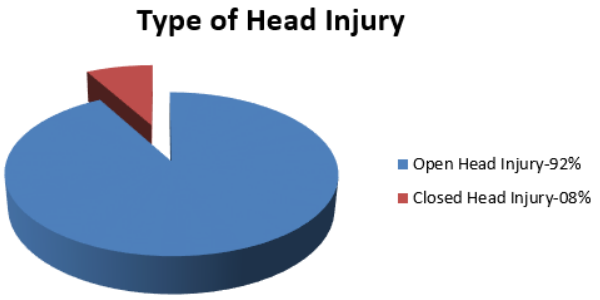

Fig. 5: Type of head injury. Open had injuries were seen in 618 fatalities. Cosed head injury was seen in 54 fatalities.

Table 1: Age group affected.

Age Group	Total number	Percentage
1-20	320	26.6%
21-40	662	54.9%
41-60	181	15%
61-80	41	3.4%

Table 2: Indicates different type of road traffic accidents contributing to head injuries.

Sl no	Type of RTA	No of Cases	Percentage
01	Motor Cycle	374	90%
02	Pedestrians	30	40%
03	Light Motor Vehicle	84	22%
04	Heavy Motor Vehicle	41	14%
05	Pedal cyclist	29	76%

5. Discussion

In the Present Retrospective Study, Road Traffic Fatalities Contributed to 51%(n-1204) (Figure 1) of the total Forensic Autopsies conducted in the Institute(n-2368), this observations are in sharp contrast with those observed by Kumar. A et al.[4] of 7008 medico legal autopsies conducted during the study period, 2472 (35.27%) were of vehicular accident fatalities. The Majority of the Victims were Male, contributing to 81.97%(n-986) (Figure 3) of Cases, this results are close to the observations made by Menon et al.[5] &Kumar. A et al.[4] who observed Majority of Male Victims in 84.6% & 88.2% respectively.

The Major Age Group Affected in the present case was 21-40years, contributing to 55%(n-662) (Table 1) of the Victims. this results are similar to the observations made by Kumar et al.[4] & Others[6–9]

The present study Head injuries were noted in 55.8%(n-672) of the Road Traffic Fatalities. In a similar Study conducted by k.k.Banerjee et al,[10] & Malik et al.[11] concluded that 31% & 43.19% of their Victims sustained Head injuries in road Traffic Fatalities. This variations is possible due to Regional factors and different type of Road Traffic Accidents. In the present study 92%(n-618) (Figure 5) of the Victims demonstrated Open Head Injuries, confirming Skull Fractures, however in a similar study conducted by Kronsbein et al.[12] Skull fractures occurred in 78.2% and intracranial hemorrhages in 80.6% of all cases, this clearly confirms that Open Head Injuries are well known in all type of Road Traffic Accidents.

The present study categorizes different type of Road Traffic Fatalities that contributed to Head injuries,Motorcycle Accidents contributed to 90%(n-374) of the Head Injuries out of total 416 cases of Motor Cycle Fatalities. In an similar study conducted by Sharma et al.[13] Motor Cyclists contributed to 27% of Head injuries. The Other Major Type of Accidents contributing to Head Injury was from Light Motor Vehicle fatalities(n-383) (Table 2) seen in 84 fatalities(22%). The pedal Cyclists contributed to 76%(n-29) Head Injury to its total number of Fatal Accidents(n-38). Hence the Cyclists[both Pedal and Motorized] contributed to Majority of Head injury during Accidents. This clearly confirms the importance of Helmets in riding this Motor Cycles.

The study also examined other Systems that were responsible for the fatalities besides Head Injury. Limbs involvement contributed to 17.3%(n-208) of Road Traffic Fatalities, this was closely followed by fatalities involving Chest region in 15.1%(n-182) cases. this clearly indicates the fact that Head is the Prime region affected[14] in All types of Road Traffic Accidents. Hence Preventions of Head from the Impact should be the prime Responsibility[15] of the Vehicle Manufacturers and Drivers/Riders of the Vehicles. The other important outcome of this research is it highlights the importance of Emergency preparedness in Hospitals to manage Head injury as an important requirement in all its centers handling Road traffic Accidents cases.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Road traffic accidents involving fatalities, Australia bureau of statistics; 1990. p. 1031–4.
2. Hung NJ, Yazdanifard R. The Study of Vehicle Safety Aspects Influencing Malaysian Urban Consumer Car Purchasing Behavior. *Int J Manag Accounting Econ*. 2015;2(8):913–24.
3. WHO. Road traffic injuries; 2022. Available from: https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries.
4. Kumar A, Lalwani S, Agrawal D, Rautji R, Dogra T. Fatal road traffic accidents and their relationship with head injuries: An epidemiological survey of five years. *Indian J Neurotrauma* . 2008;5(2):63–7.
5. Menon A, Vishwas K. A Rajeev attern of fatal head injuries due to vehicular accidents in Mangalore. *J Forensic Leg Med*. 2008;15(2):75–82.

6. Chandra J, Td D, Dikshit PC. Pattern of craniointracranial injuries in fatal vehicular accidents in Delhi. *Med Sci Law*. 1979;19:188–94.
7. Salgado MS, Colombagesm S. Analysis of fatalities in road accidents. *Forensic Sci Int*. 1998;36(1):91–7.
8. Friedman Z, Kungel C, Hiss J, Margovit K, Stein M, Shapira S. The Abbreviated injury scale - a valuable tool for forensic documentation of trauma. *Am J Forensic Med Pathol*. 1996;17(3):233–41.
9. Sharma BR, Harish D, Sharma V, Vij K. Road Traffic accidents - a demographic and topographic analysis. *Med Sci Law*. 2001;41(3):266–74.
10. Banerjee BBKK, Kohli NK. Study of head injury victims in fatal road traffic accidents in Delhi. *Indian J Med Sci*. 1998;52(9):395–403.
11. Malik Y. Head injury in road traffic accidents - A study from North East India. *Int J Contemp Med Res*. 2019;6(10):1–4.
12. Kronsbein K, Karger B, Budczies J, Pfeiffer H, Wittschieber D. Updating the risk profile of fatal head trauma: an autopsy study with focus on age- and sex-dependent differences. *Int J Legal Med*. 2020;134(1):295–307.
13. Sharma BR, Gupta N, Sharma AK, Sharma. Pattern of Fatal Motorised Two Wheeler Crash Injury in north india. *Trends in Medical Research*. 2007;2(1):27–36.
14. Sahdev P, Lacqua MJ, Singh B, Dogra TD. Road Traffic fatalities in Delhi: causes, injury patterns and incidence of preventable deaths. *AccidAnn Prev*. 1994;26:377–84.
15. Henriksson EM, Ostrom M, Eriksson A. Preventability of vehicle-related fatalities. *Accid Ann Prev*. 2001;33:467–75.

Author biography

Dinesh Rao, Professor and Head

Ananya, Junior Resident

Meva, Junior Resident

Cite this article: Rao D, Ananya, Meva. Head injury & road traffic fatalities-An analytical study of road traffic accident deaths. *IP Int J Forensic Med Toxicol Sci* 2022;7(3):77-80.