Original Research Article

Socio-demographic Profile of Victims of Fatal Head Injury in Road Traffic Accidents: An Autopsy-based Study

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Abstract

Introduction: Road Traffic Accidents (RTAs) have emerged as a new health challenge in the world which not only leads to injuries, disabilities and loss of precious human lives but also imparts a substantial economic burden on the family concerned and the nation as whole. As progress is made in the prevention and control of infectious diseases, the relative contribution of deaths from non-communicable diseases and injuries has increased. Road traffic injuries are the eighth leading cause of death for all age groups. **Material and methods:** This one year study was conducted in Department of Forensic Medicine & Toxicology, Mahatma Gandhi University of Medical Sciences and Technology. During this period 192 deaths were due to road traffic accident out of this 117 were as a result of fatal head injuries. **Results**: In the study 80% were males and 20% were females. Majority of subjects were belonging to age group of 31 to 40 years (24.8%), followed by 21 to 30 years (20%). There was no significant difference in age and gender distribution. 81.2% Subjects were brought dead and 18.8% were died after admitted to hospital. **Conclusion**: Road are like arteries of country. Vehicles must run for development of country and necessities of life. Injuries on head and other parts of body due to road traffic incidents are unavoidable but with scientific data, we can minimize the loss of life and misery due to death and injury. We should design our interventions based on these data and studies.

Key words: Road Traffic Accidents; Head injury; subarachnoid haemorrhage.

Introduction

Road Traffic Accidents (RTAs) have emerged as a new health challenge in the world which not only leads to injuries, disabilities and loss of precious human lives but also imparts a substantial economic burden on the family concerned and the nation as whole[1]. As progress is made in the prevention and control of infectious diseases, the relative contribution of deaths from non-communicable diseases and injuries has increased. Road traffic injuries are the eighth leading cause of death for all age groups[2]. More people now die as a result of road traffic injuries than from HIV/AIDS, tuberculosis or diarrheal diseases. According to the WHO report (Global Status Report on Road Safety 2018) 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 which, to date, has largely neglected road safety[3].

Head injury is the most common site to be injured in RTAs. Road traffic accident is a preventable cause of death[4]. The exponentially increasing number of automobile vehicles, poor adherence to traffic rules and regulations such as maintaining lane discipline, driving in zigzag patterns by public, poorly maintained and congested roads, abuse of alcohol, and lack of awareness about helmets and new generation of high-speed vehicles are altogether responsible for accidents[5].

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The mechanical forces like shearing, strains and biophysical motion that occur during accidents to the head are responsible for patterns of injuries[6]. This study was carried out to determine the pattern and distribution of head injuries in victims of fatal road traffic accidents in a rural tertiary care centre[7].

Material and Methods

This is a prospective study was conducted on medico legal cases coming for autopsy in Department of Forensic Medicine & Toxicology, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur over a period of 1 year. During this period, a total 254 medico-legal autopsies were performed in our department. 192 deaths were due to road traffic accidents, out of which 117 deaths were as a result of fatal head injuries.

Inclusion Criteria

All cases of head injuries which have a definite history of road traffic accident as per history and police inquest papers would be taken for the study.

Exclusion Criteria

Cases in which bleeding in brain was ruled to be due to some disease process and not due to trauma were excluded.

Material used

1. Head injury victims coming for medico legal autopsy.
2. Documents received from police like forwarding letter and inquest report
3. Cases summary in cases which were admitted in some hospital before death.

4. Autopsy table and instruments.
5. Magnifying lens and measuring tape.
6. Photographic equipment.
7. Post mortem reports.

Data relating to road traffic accident was collected from the records of investigating police officers like forwarding letter and inquest report Facts regarding the event were obtained from accompanying relatives, friends of the deceased, eye witness etc. if found reliable. If the victim was treated in some hospital or nursing home before death, hospital records, if available, were reviewed to gather relevant information for present study. After obtaining the necessary and relevant information about the victim, a thorough and complete autopsy was performed on the dead body, recording the findings on the proforma. A pre-tested proforma specially designed for this purpose was used for collection of data. The information collected consisted of demographic profile of victims, type of vehicle involved, site and severity of injury, and whether the involved driver had consumed alcohol or not.

Statistical Analysis

The obtained data was entered into Microsoft excel, checked for any error and analysed using SPSS (Statistical Package for Social Sciences) version 18.0 database (SPSS Inc., Chicago, IL). Interpretation of the data was done by using descriptive statistics like frequency and the percentage.

Results

In this one year prospective study Total 254 medico-legal autopsies were performed at department of forensic medicine, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, out of these 192 deaths were due to Road traffic accidents. In this one year prospective study 117 deaths were as a result of fatal head injuries, included

Table 1: Age wise distribution of Victims of Head Injury in Road Traffic Accident

Age (years)	Total autopsies	Death in RTA	Death due to head injuries in RTA
0-10	1	0	0
11-20	18	12	3
21-30	53	47	34
31-40	63	59	43
41-50	46	38	19
51-60	21	9	7
61-70	31	18	9
> 70	21	9	2
Total	254	192	117

Table 2: Distribution of Gender N=117

Gender	Numbers	Percentage
Male	93	79.4
Female	24	20.6
Total	117	100

Table 3: Distribution of victims either brought dead or admitted

Parameters	Numbers	Percentage
Brought Dead	95	81.2
Later Dead	22	18.8
Total	117	100

In table 3, subjects were brought dead 81.2% and later were died due to 18.8%.

Table 4: Area wise distribution of victims N=117

	Rural N (%)	Urban N (%)	Total N (%)
Male	42 (35.8%)	51 (43.5%)	93 (79.4%)
Female	11 (9.4%)	13 (11.1%)	24 (20.6%)
Total	53 (45.2%)	64 (54.7%)	117 (100%)

Table 5: Education wise distribution of victims N=117

	Male	Female	Total N (%)
Illiterate	9	3	12 (10.2%)
Primary	17	7	24 (20.5%)
Secondary	31	9	40 (34.1%)
Higher sec.	20	3	23 (19.6%)
>higher sec.	16	2	18 (15.3%)
Total	93	24	117 (100%)

Table 6: Distribution of victims as consumption of alcohol N=117

Age	Victim consume alcohol	Victim not consume alcohol	Total
0-10	0	0	0
11-20	2	1	3
21-30	21	13	34
31-40	24	19	43
41-50	13	6	19
51-60	4	3	7
61-70	5	4	9
> 70	0	2	2
Total	69	48	117

Table 7: Association between Site and type of Scalp injuries among Head injury victims N=117

	Contusion		Abrasion		Laceration		Total	
	Numbers	%	Numbers	%	Numbers	%	Count	%
Frontal	19	16.23	12	10.25	7	5.98	38	32.47
Parietal	17	14.5	6	5.12	9	7.69	32	27.35
Temporal	7	5.9	4	3.41	13	11.11	24	20.51
Occipital	4	3.4	9	7.69	10	8.54	23	19.65
	47	40.17%	31	26.49%	39	20.47%	117	100%

Total 32.47% had Frontal injury, 27.35% had parietal injury, 20.51% had temporal injury and 19.65% had occipital injury. There was significant association between site and type of scalp injury (Table 7).

Table 8: Intracranial injuries in the victims of head injuries in RTA

	Number of Victims	%
Subarachnoid haemorrhage	11	36.6
Subdural haemorrhage	9	30.0
Intra cerebral haemorrhage	7	23.3
Extradural haemorrhage	3	10.0
Total	30	100%

In the present study 36.6% had subarachnoid haemorrhage, 30.0% had subdural haemorrhage, 23.3% had intracerebral haemorrhage, 10.0% had extradural haemorrhage in Table 8.

Discussion

In the present study, total fatalities comprised 254 out of total 192 Death in RTA and 117 Death due to head injuries in RTA. In our study head injuries were seen in majority were males (79.4%) and middle-aged subjects (31 to 40 years) were 43. This distribution suggests that males are predominantly occupied in outdoor activities to earn the livelihood of the family. Similar observations were made by Sreekanth S Nair et al. [6], in their study observed that 92.5% were males and 7.5% were females. The findings were also consistent in the studies done by Ngo Anhl [8] and Dovom[9]. Middle aged (21 to 50 years) individuals were most common age group with head injuries (61.73%) in the present study. Similar findings were made by Nair et al[6], 64.3% were in the age group b/w 21 to 50 years. Similar observations were made by Sinha and Sengupta[10] and Salgado[11].

Age distribution in the study reconfirms the risk behaviour of males and middle-aged people due to outdoor exposure for various reasons and hence more prone for Road traffic injuries with head injuries. Also, restricted use of helmets can lead to exponential increase in head injuries especially among two wheelers[12].

In our study, the most commonly death due to head injuries in RTA was 117 (46.06%). Similar observations were reported in studies from Banwari M S et al. Out of total 1699 cases (68.73 %) who sustained head injury, 1183 cases (69.63%) had a fatal skull fracture. Similar findings were seen in few other studies[13].

In our study, subjects were brought dead 81.2% and later were died due to 18.8%. Similarly, Nair[6] observed that most persons were expired before reach to hospital. These findings were also consistent in the studies done by Menezes RG[14].

In our study, the most of the victims were from urban areas (54.7%), while rural residents were involved in 45.2 percent of the cases. This is due to more common accidents in urban areas, which may be due to two-wheelers being the most common mode of transportation in urban areas, as well as a lack of knowledge and awareness of traffic rules among the majority of urban residents. Our institution is situated beside the highway, at the crossroads of the city and urban areas. In the event of an accident in the hamlet or a neighbouring city, the patient is sent to our hospital. The findings of this research similar to those of Verma PK et al., and who identified the majority of cases in the urban population. The difference might be attributable to the hospital's location and catchment region[15].

In the current study, 40 (34.1%) of the 117 patients had only completed secondary school followed by primary and secondary school were 20.5% and 19.6% respectively. Skowronek R et al. found similar most of subjects were secondary grade only followed by more accidents among uneducated may be related to the increased usage of two-wheelers or being a pedestrian, as well as a lack of knowledge of traffic laws[16].

In our study, total 32.47% had Frontal injury, 27.35% had parietal injury, 20.51% had temporal injury and 19.65% had occipital injury. There was significant association between site and type of scalp injury. In the study by Nair et al[6], 75% had skull fractures and similar findings were made by Skowronek R[16]. In our study 36.6% had subarachnoid haemorrhage, 30.0% had subdural haemorrhage, 23.3% had intracerebral haemorrhage, 10.0% had extradural haemorrhage which is consistent with the findings by other researchers[17]. Freytag E (1962) in her study found that 41% of the cases of head injuries were due to fall and 23% were due to road traffic accidents[18].

Conclusion

Present study showed that road traffic accidents were more common in the younger population and active males. Two & four wheelers were more vulnerable and good number of drunk drivers were involved. Head, neck & face injury was found to be most common. The rate of incidence is higher in India because of its traffic patterns and their demographic profile. Possibly, the lack of preventive measures such as helmets in motor cyclists, seatbelts in automobiles, poorly controlled traffic conditions and poor road conditions are other factors responsible for injuries.

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