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DEMOGRAPHIC STUDY OF DEATHS DUE TO ROAD TRAFFIC ACCIDENTS, EXAMINED IN DR. S.N. MEDICAL COLLEGE, JODHPUR (RAJ.)

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Abstract
Accidents are not due to external factors all the time but often they occur due to failure of control of self-conscience and free thoughts. Road Traffic Accidents is still the major cause of death worldwide including India. A retrospective study has been conducted in Dr. S.N. Medical College, Jodhpur (Raj.), in the year 2019 to study the pattern and distribution of Head Injuries of fatal road traffic accidents and to prepare the demographic profile of it. Out of total 901 cases, male to female ratio was 9:1, and commonest age group affected was 21-30 years (39.8%). Among total victims, Hindus were 748 (83%) and rests were Muslims 103 (11.4%) and other religions. Head injury was the most common injury, present alone in 509 cases (56.4%) and in 392 (43.6) cases along with other injuries. Skull fractures were found in 451 (50.5), in which linear/fissure fracture (32.9%) was most common. Most common bone fractured was temporal bone. The commonest variety of intracranial hemorrhage was subdural hemorrhage and craniotomy was done in 29 (3.2%) cases.
Keywords: Accidents, Road traffic, Head injury, Fractures.

Introduction

Many highways are linked to Jodhpur as it is a major city of Rajasthan and Dr. S.N.M.C. Jodhpur has a biggest trauma center in western Zone of Rajasthan. Many dead bodies and person having fatal injuries in Road Traffic Accident are brought in this trauma center. Road traffic accidents, since years claim the highest number of suffering life worldwide. As per Institution of Road Traffic Education, India accounts for about 11% of RTA fatalities worldwide (2018)[1] Road accidents have earned India a dubious distinction, with over 145000 death.

Deaths annually; in 2018 itself the country has overtaken China and now has the worst road traffic accident rate worldwide, with the death toll rose to 15 per hour in 2018 as opposed to 13 the previous year.[2] In 2018, The Global status report on road safety estimates that more than 1350000 people are killed in road traffic crashes in India every year. Approximately half of all deaths are among vulnerable road users - motorcyclists, pedestrians and cyclists.[3]

The present study is therefore conducted in the Department of Forensic Medicine in Jodhpur to emphasize the increasing incidence of the fatal RTA and to study the pattern of Head Injuries present in these RTA victims in this western region of India in order to establish a demographic profile of the Victims.

Material and Methods:

The present study was conducted at Dr. S.N. Medical College, Jodhpur from Jan. 2019 to Dec. 2019. Material included all dead bodies (n = 901 cases) of fatal RTA brought to the Department of Forensic Medicine, Dr. S.N. Medical College, Jodhpur for autopsy.

A performa, for recording the pattern of injuries and demographic profile was prepared and data was collected from Police, relatives, doctors, Hospital records and also from post-mortem findings. The relevant history about the injuries to the victims was also collected. All RTA victims dying on spot and hospitalized from the time of accident were included in the study. All unknown and unidentified cases were excluded in this study.

Observations and Results

In this study, it was observed that most affected age group was between 21-30 years having total 359 cases (39.8%), followed by 31-40 years 221(24.5%). All age groups are dominated by males with maximum sex differentiation in 21-30 years age group. **(Table 1)**

Both sexes were affected maximum in 21-30 years age group. In the present study males (n=791, 87.8%) outnumbered females (n=110, 12.2%) significantly with male to female ratio of nearly 9:1 **(Table 2).** In this study

total 748 victims were Hindus (83.01%) and 103 were Muslim (11.43%) and others (**Table 3).**

Total numbers of hospitalized cases were 613 (68%) and rest were non hospitalized i.e. 288 (32%), which showed that either the victims died on spot or on the way to the hospital **(Table 4).** Head injury alone was most common injury (excluding minor abrasions, laceration and ecchymosis) and was present in 509 cases (56.49%). Other injuries were present in different regions in different combination in 126 victims **(Table 5).**

Injury to the face was seen in 212 deceased (23.5%), with facial fractures in 27 victims. Scalp was ecchymosed in 712 cases (79.02%) and lacerated in 335 (37.18%). In present study Skull fractures were seen in 451 cases (50.5%). Intracranial hemorrhages were seen in 712 cases (79.02%), cerebral contusion and laceration in 335 cases (37.18%) and cerebral necrosis in 392 cases (43.5%). Surgical intervention was done in 113 patients (12.54%) in which 29 (3.2%) had undergone craniotomy **(Table 6)**

Among the Skull Fractures, Frontal bone was fractured in total 327 cases (36.29%), Temporal bone in total 387 cases (42.95%), Parietal bone in 325 cases (36.07%) and Occipital bone was fractured in total 223 cases (24.75%). Base of the skull bone (including all cranial fossa) was fractured in total 223 cases Multiple fractures were most common (50.28%) followed by temporal bone fracture alone (42.95%) and parietal bone fracture alone (36.07%) respectively **(Table 7).**

Out of 901 cases, Linear/Fissure type of skull fracture was most common (n=297, 32.97%) followed by Radiating fracture in 230 cases (25.53%), But Multiple fractures (more than one type) being most common seen in 453 cases (50.25%) **(Table 8).**

In our study 73(8.10%) victims had Extradural haemorrhage, 214 (23.75%) had Subdural haemorrhage, whereas subarachnoid haemorrhage was present in 198 cases (21.98%). Intra-cerebral haemorrhage was seen in 27 cases (2.99%).

Combined haemorrhage (more than one type) was seen in 603 victims (66.9%). Most common type of individual Intracranial Haemorrhage was subdural followed by subarachnoid haemorrhage **(Table 9).**

Table 1: Age and Sex-Wise Distribution of Cases

Age Grp. (yrs)	Male	Female	Total	Percentage
0-10	44	6	50	5.55
11-20	56	9	65	7.21
21-30	302	57	359	39.84
31-40	198	23	221	24.53
41-50	91	7	98	10.88
51-60	64	5	69	7.66
>60y	36	3	39	4.33
Total	791	110	901	100%

Table 2: Sex-Wise Distribution

Sex	Cases	Percentage
Male	791	87.8
Female	110	12.2
Total	901	100%

Table 3: Religion wise Distribution of cases

Religion	Cases	Percentage
Hindus	748	83.01
Muslims	103	11.43
Others	40	4.43
Total	901	100%

Table 4: Hospitalized and Non Hospitalized cases

Cases(N=901)	Percentage	
Hospitalized	613	68
Non Hospitalized	288	32
Total	901	100%

Table 5: Region Wise Distribution of Injuries

Region	Cases		(%)
Alone	Combination		
Head Injury	509	509	56.49
Chest/Thoracic	113	113	12.54
Abdomen	83	83	9.21
Pelvic Injury	57	57	6.33
Chest + Head	113+509=	622	69.03
Abdomino-Pelvic + Head	83+57+509	649	72.03
Abdomen + Chest	113+83	196	21.75
Pelvic + Other Injuries	57+392	449	49.83
Head+ Chest+ Abdomino-pelvic	509+113+130	752	83.46
Multiple(>1 Region)	126	126	13.98

Table 6: Distribution of Head Injuries including Face

Area involved	Cases	(%)
Face injuries	212	23.5
Scalp ecchymosis	712	79.02
Scalp laceration	335	37.18
Skull fracture	451	50.50
Intracranial hemorrhages	712	79.02
Cerebral Contusion/laceration	335	37.18
Cerebral necrosis	392	43.5
Surgical Intervention	113	12.54
Craniotomy/burr	29	3.22

Table 7: Distribution of Skull Fractures

Region	Right	Left	Right+ Left	Total (%)
Frontal	165	162	327	36.29
Temporal	194	193	387	42.95
Parietal	160	165	325	36.07
Occipital	115	108	223	24.75
Base	114	109	223	24.75
Multiple	231	222	453	50.28

Table 8: Types of Skull Fractures

Types	Cases	Percentage (%)
Fissure/Linear	297	32.96
Commuted	135	14.98
Radiating	230	25.53
Sutural	212	23.53
Depressed	113	12.54
Hinge	57	6.33
Multiple(>1 Type)	453	50.28

Table 9: Distribution of Brain Haemorrhages

Types of Haemorrhage	Cases	Percentage (%)
Extradural	73	8.10
Subdural	214	23.75
Subarachnoid	198	21.98
Intra Cerebral	27	3.00
Combined(>1 Type)	603	66.93

Discussion:

In the present study young people of age group 21-30 years (39.8%) were the most common victims, which is similar to findings of multiple authors from various geographical regions of India.[4-7] Pramod Kumar Verma et al[8] showed high incidence of traffic injuries in age group 15-55 years. H. Singh and Dhattarwal[9] found two third of cases are in age group 11-40 years. According to the NCRB Report for the year 2012 and 2013, the most common age group involved in RTA was 30-44 years followed by 15-29 years.[10, 11]

A large number of cases in the young age group can be justified by the fact that young persons in this age group are at the peak of enthusiasm, energy and creativity. They lead active life and have the tendency to take undue risk like speed driving, overtake wrongly, triple riding of bike, boarding over running vehicle etc. which expose them to the hazards of accidents and injuries.

In present study it was observed that male outnumbered females with a significant male to female ratio of nearly 9:1. Almost all the studies over RTA have conclusively pointed out male dominance like Arvind Kumar et al.[4]

R. Ravikumar,[7] Dhaval Patel et al,[12] B. C. Shivkumar et al,[13] and Behera et al[14] also got the same findings. In NCRB report of 2013 out of all RTA fatalities 76.7% are male and 23.3% are female.[11] The predominance of male can be explained by the fact that males lead a more active life, travel more, drive more and so expose to the hazards of traffic, accidents and trauma.

Females generally stay at home, but now there is increasing trend of RTA among females too due to their awareness regarding career and their active participation in socio-economic activities. Our findings regarding sex ratio did not match with Akhilesh Pathak et al,[15] Harman singh et al,[9] Chandra et al,[16] and Agnihotri et al[17], who found lesser sex ratio in the range of 2:1 to 5:1.

Hindus (n=748) outnumbered Muslims in the ratio of 8:1 which is simply due to more numbers of Hindus in and around Jodhpur region. Other religions are quite less populated in and around Jodhpur region.

In our study 61.2% (552) cases sought Medical aid. Dhaval et al[14] reported 67% cases died on spot. This reflects the severity of injuries produced by the accidents as well lack of proper medical aids soon after the accidents. Large number of studies supports our findings.[9,12,16,18] In our study Head Injury was the most common type of injury sustained wit

h total 509 cases (including superficial and serious injuries). A total of 451 cases had skull fractures and 712 cases had shown intracranial hemorrhages.

The reason might be that head is the most vulnerable part because of its top location in the body and immovability of brain tissue.

According to the Brain Injury Association Traumatic Brain injuries, mainly due to RTA is the leading cause of death in young people and Motor vehicle crash accounts for 50% of total fatal and non - fatal injuries.[19]

Majority of other studies are supporting our findings.[4,14-16] According to B. R. Sharma et al[20] head injury accounted for 75% of all fatal road traffic accidents. Pamod Kumar Verma et al[8] and E. Ravikiran et al[18] contradicted our findings by concluding limb injuries and abdominal injuries respectively, are the major injuries in RTA. Like our study Cerebral contusion and laceration (n=335, 37.18%) was found in majority of other studies.[4,13,16]

We reported 50.50% (451) cases of skull fractures, which other studies also supported.[4,9,16,20] Temporal bone was most commonly involved followed by parietal.

This finding tallied with the most other studies.[4,6] but multiple skull bones fracture was most common type. Few studies like Dhaval et al[12] found Parietal bone fracture as most common whereas Arvind Kumar et al[4] stated base of skull as most common bone fractured.

More involvement of temporal bone in RTA might be due to inclination to fall towards one side in RTA. The lateral location of bone exposes it to the hazards of RTA.

Regarding individual types of fracture, simple/linear or fissure fracture was the most common type encountered in 32.96% cases followed by radiating fractures which is similar to findings of other studies.[12,13,15]

Over all Multiple types of fracture were most common comprising 50.28% (n=453) cases and can be explained by the fact that in majority of cases secondary impact is common after primary impact Our findings of subdural haemorrhage (23.75%) followed by subarachnoid haemorrhage (21.98%) as most common intracranial

haemorrhage is similar to other studies.[4,9,12,13,15,20] Combined haemorrhage was seen in 66.93% cases.

Chandra et a.l[16] in contrast found Subarachnoid Haemorrhage most common. Subdural Haemorrhage occurs mostly due to tear of bridging vein during frequent change in the velocity.

Conclusion:

In Present study, RTAs were more common in the younger age groups and in male sex. Majority of victims sought medical help.

Head injury was the major cause of death in majority cases of RTAs mostly due to Subdural and Subarachnoid Haemorrhages.

This further shows the need of strict implementations of rules for controlling the speed of vehicle. As Head injury is the major cause of death in RTA, the Government should make strict rules for implementation of use of safety helmets for bike riders, for prevention of driving under influence of alcohol, and for the proper training of Drivers, Police personnel, Traffic controller etc.

Government must also make arrangements for proper lighting and signaling over roads and install modern vigilance system.

Overall improvement in the Emergency Medical services is a must to decrease the death toll due to RTA.

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