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Fatal Injuries Associated with Road Traffic Accidents: An Autopsy Based Retrospective Observational Study on Brought Dead Cases in Jaipur, Rajasthan

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Abstract

Background and Objectives: the vast majority of trauma centers OPD is a result of RTA. Understanding and dealing with varied patterns of fatal injury in road traffic accident cases is critical to a trauma center's effectiveness. Road traffic crashes claim the lives of approximately 1.3 million individuals each year[1]. Pedestrians, cyclists, and motorcyclists made up about half of the total[2]. The primary goal of this research is to examine the patterns of fatal injuries and to assess the needs and approaches at trauma centers.

Methods: The current study was conducted at the forensic medicine department of SMS Medical College and Attached Hospitals, Jaipur, among brought dead road traffic accident cases brought to SMS MC Trauma centre. This cross-sectional study was conducted to shed light on various fatal bodily injuries that cause a person to die so quickly. In this study, The study included cases from January 1st, 2021 to December 31st, 2021. All information gathered from postmortem reports, panchnamma, and record register.

Results: 369 cases were brought dead RTA cases at trauma centre which involved in this study. Male victims accounted for 85.90 percent of instances (n=317), while female victims accounted for 14.9 percent (n=52). The majority of the victims were between the ages of 21 and 40. 20.86 percent (n= 77) of instances occurred between 6:00 and 9:00 p.m., followed by 20.05 percent (n= 74) of cases occurring between 3:00 and 6:00 p.m., 70.46 percent (n=260) of the victims were two-wheeler drivers or passengers. RTA was somewhat more common on the highway (52.3%) (n= 192) than in the city (47.96%). (177). Coma was the most common cause of death, accounting for 57.18 percent of all deaths (n= 211). The most common postmortem findings were bone fracture 85.90 percent (n=317) and injury to a key organ 88.88 percent (n=328).

Conclusions: The study reveals the distribution of fatal injuries, which gives us an indication of the necessity for advanced trauma centre facilities. This study will assist us in gaining a better understanding of the fatality rate of various bodily traumas. It could be a step forward in helping us preserve a precious life by indicating the focus of attention during the assessment of badly traumatized RTA patients.

Key words: road traffic accident, fatal injuries, trauma centre, brought dead

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Introduction

In India, accidents kill more people than terrorism or natural disasters, yet we never talk about it. Mr. Nitin Gadkari, India's surface transport minister[3]. Every day, 1214 traffic accidents occur in India. Two-wheelers account for 25% of all fatalities on the road. Every day, 377 people die, the equivalent of a jumbo plane crash[4]. Accidents are a major non-communicable illness epidemic in the twenty-first century[5]. It makes road traffic accidents a serious public health problem that must be addressed.

Epidemiological studies have been undertaken around the world using data extracted from emergency rooms, websites, ambulance records, and police files[6,7,8]. Medico-legal autopsies, on the other hand, have been highlighted as critical in the epidemiological assessment of RTA cases. RTA cases have been assessed using medical-legal autopsy in investigations in Manipal[9] and Bengaluru[10] (India), Iran[11], Bangui[12], Australia[13], Mthatha and Transkei (South Africa)[14], Sri Lanka[15], and Kazakhstan[16]. Medico-legal autopsies are used to determine the precise cause and method of death, as well as the time since death and the circumstances surrounding death[17]. We can greatly minimize deaths by understanding the elements that determine the death rate due to RTA and executing it.

Age and gender are two of the most important risk factors to be considered when assessing RTAs. Of all age groups and genders, young males have been reported to be more prone to experiencing RTAs[18]. Numbers of Cases were also influenced by the clock time. Head injury and vascular injury was the foremost reason behind running out of time to save a patient. This provides us good Information about alarming sign of serious patient who need prompt attention in trauma emergency.

The number of RTA instances fell in May and June, perhaps as a result of the second lockdown, which was imposed worldwide at the time because to the COVID-19 pandemic. Large and small businesses, schools, and colleges were all closed down immediately at the time. This was a preventive strategy that helped to reduce the number of deaths caused by RTA at the time, but it was also destructive in other ways. A detailed examination of the traffic data reveals that the number of fatalities per kilometer travelled has risen. Higher speeds due to decreased traffic volumes, a lack of rule enforcement, and a higher proportion of walkers and motorcyclists who are more vulnerable than other road users, could all are contributing factors[19]. As a result, lockdown hasn't shown to be highly successful in terms of deaths.

Numerous RTA-related postmortems have been conducted at SMS MC. It accounts for nearly half of the daily number of postmortem examinations. It got my attention. We intend to get epidemiological attribution of RTA causalities in this study by getting data from medico legal autopsies of brought dead RTA victims at SMS Medical College and Attached Hospital, Jaipur, Rajasthan. Our main focus is the distribution of serious and fatal injuries, such as bone fractures, injuries to key thoracic and abdominal organs, brain traumas, and death causes. We also paid close attention to details such as the location of the incident, the time, the vehicle involved, and the driver or occupant.

Materials and Methods

Our study is a retrospective observational record based study. All of the information gathered by our department. The key to obtaining needed information was an office copy of the autopsy report, panchnamma, and record register. The study was conducted over a one-year period. All of the road traffic accident victims who were brought dead at the SMSMC Jaipur trauma centre were placed on the table. Between January 1st and December 31st, 2021, 369 cases were scrutinized by Age, sex, shifting time, month of occurrence, day of occurrence, and time of occurrence were all used to separate the data. We look at the incidence location, the wounded body part, and the body's important organs. It will enable us to investigate the causes of early death following an RTA. Exclusion criteria in this study were an unknown deceased body, a shift time of more than 6 hours, and treated referred cases.

All pertinent data was collected and recorded into a Microsoft Excel data sheet. Data was entered into SPSS using Microsoft Excel. The mean and standard deviation for categorical data were used. Data that is not categorical is expressed in percentages and proportions. The chi square test and other appropriate

statistical tests for significance were used to examine the significance of the derived results. A statistically significant P value of <.05 was used.

Observations and Discussion

During the study period, 3579 postmortems were conducted, with 1691 (47.24%) of those cases being related to road traffic accidents. 369 (21.82%) were brought dead at trauma emergency within 6 hours of the event. Depict in Figure no. 1.

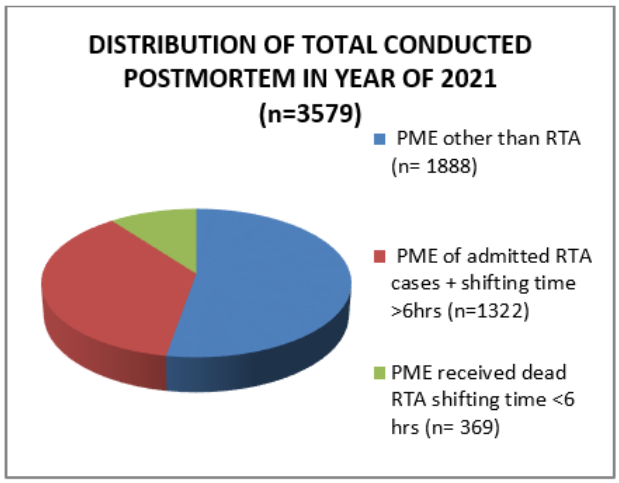

Figure 1: Represents distribution of total conducted PME

The study included 369 cases, of which 317 (85.90 percent) were male and 52 (14.09 percent) were female, similar to Tanuj Kanchan et. al[9]; male of 89.8% and female of 10.2 %, Deepak Sharma et al[20]; male of 77.30% and female of 22.69%, and Arvind Kumar et. al[21]; male of 88.22% and female accounted for 11.77%. The majority of the males who died were between the ages of 21 and 40, with 220 deaths (59.62%). Deepak Sharma et. al.[20] (63.91%), Arvind Kumar et. al.[21] (54.25%), Aiman Kurshid et. al.[22] (54.5%), and N. Bayapa reddy et. al.[10] (50%) are all in agreement with these findings (2014). The age group of 41 to 60 years old came in second, with 86 people in that category (23.30%). In this study, the male to female ratio was 6.09:1. This is in line with the findings of Aiman Kurshid et. al.[22] (6.03:1), Arvind Kumar et al[21] (7.49:1), N. Bayapa Reddy et. al.[10] (11.5:1), and Deepak Sharma et. al.[20] (3.4:1).

Women 19 (36.53%), 16 (30.76%), and males 201 (63.40%), 70 (22.08%) were tied for first and second place in both age categories. This is shown in table number 1.

Table 1: Representing age sex distribution

Age group (yr)	Male (%)	Female (%)	Total
0-20	30	9	39 (10.56%)
21-40	201	19	220 (59.62%)
41-60	70	16	86 (23.30%)
>60	16	8	24 (6.50%)
total	317(85.9)	52 (14.0)	369

The chi- square statistic is 16.7957
The *p*-value is .000779
The result is significant at $p < .05$
Mean, μ: 34.86
Median = 32
Standard Deviation, σ: 14.986144860831

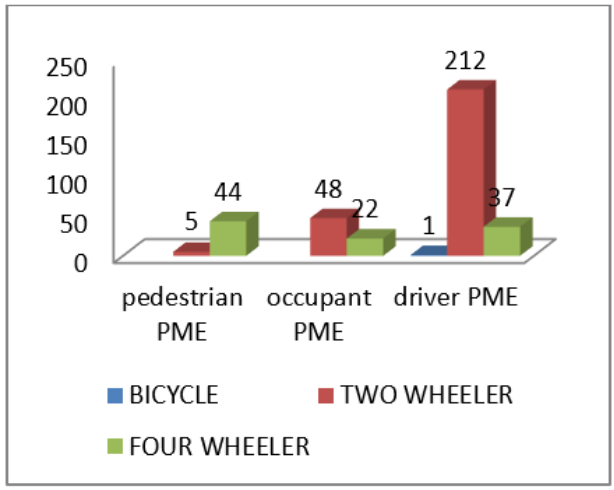

Figure 2: Represents driver/ occupant distribution

Among the occupant and passenger, 212 (57.45%) cases are of two wheeler driver, followed by two wheeler occupant, which are 48 (13%). Maximum no. of two wheeler users were died, 260(70.46%) followed by pedestrian, 49 (13.27%) which is consistent with findings of Patil et.al[25] (2008), Tanuj Kanchan et. Al[9] and Gururaj et. al[24]. Number of two wheeler driver of total consistent with Patil et. al[25] (61.2%), Deepak Sharma et. al.[20](75.0%), but contradicted with findings of Archna et. al[26]; they observed that pedestrians were maximum number of fatalities (35.79%) followed by two wheeler (30.5%). In 44 (11.92%) cases, people walking on foot have been trampled by four wheelers, which is consistent

with Jha et. al.[27] and 22 (5.96%) people are those who were riding in four wheelers which was contrast with findings of Patil et. al.[25]. Depict in Figure no. 2.

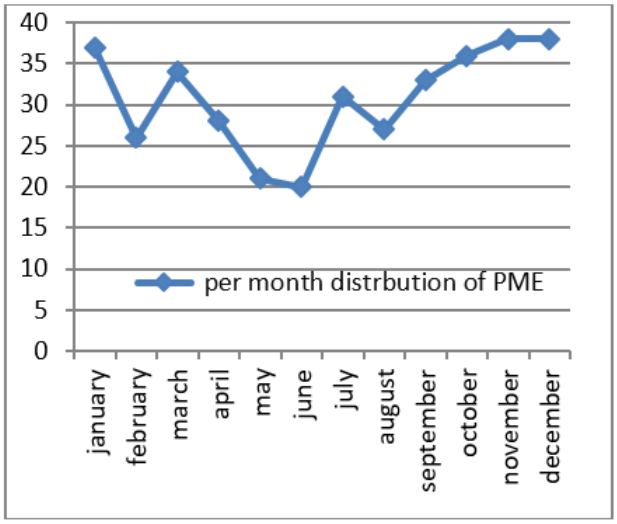

Figure 3: Line graphical representation of per month cases

This Figure no. 3 shows the number of cases occurring month wise. There was a decline in the number of postmortems in 2 special months when India was locked down due to 2nd wave of COVID. In these two months, the number of cases in May and June were 21(5.69%) and 20(5.42%) respectively.

The second thing that is worth seeing is that it is at its maximum feet in winter. These four months of winter, January in the beginning of the year in which the number of cases was 37 (10.02%) and 36 (9.75%), 38(10.29%), 38(10.29%) cases were found at the end of the year in month of October, November and December respectively. I found only one paper Aiman Khurshid et. al.[22] (Karachi, Pakistan) whose graphical representation was so much similar in distribution of accident death throughout the year.

During this study, we have found variation in the number of accidents at different time of the day. The cause of more than average accidents in one particular time zone of the day must be the number of vehicles on the road, congestion and hurry to go their destinations, all together in that moment. In 52.03% (n=192) of received dead cases, the location of the incident was the highway and in 47.96% (n=177) of the cases, it happened in the periphery of the city. Which is in contrast with N. Bayapa reddy et. al.[10] in which 30% cases were reported from highways and 70% cases were reported from city roads. Maximum no. of cases occurred 6:01 PM to 9:00 PM of window amounting 20.8% cases (77) followed by 03:01 PM to 06:00 PM midnight was 20% of cases(74). These findings are consistent with Aiman Khurshid et. al.[22] in which maximum percentage of cases (52.8%) and N. Bayapa Reddy et. al.[10] (69%) occurred during 12:00 PM to 12:00 AM. Depict in Table no.2.

Table 2: Number of road accidents deaths on highway or in city by time of occurrence

Time Interval	Highway	In City	Total (%)
00:01 AM TO 03:00 AM	15	14	29(7.8)
03:01 AM TO 06:00 AM	13	4	17(4.6)
06: 01 AM TO 09 :00 AM	12	15	27(7.3)
09: 01 AM TO 12: 00 PM	16	24	40(10.8)
12: 01 PM TO 03: 00 PM	25	27	52(14.0)
03: 01 PM TO 06: 00 PM	31	43	74(20.0)
06: 01 PM TO 09: 00 PM	46	31	77(20.8)
09: 01 PM TO 12: 00 AM	34	19	53(14.3)
Total	192 (52.03%)	177 (47.96%)	369(100)

Chi- square value: 15.338341768528
Degrees of freedom: 7
P value: 0.031898821641
P value is <.05, place of accidental death and the time interval of occurrence are dependent.

We found that coma (head injury) accounted for the highest number of deaths, which was 57.45% percent of the total. This finding is consistent with Aiman Khurshid et al[22] (nearly 75%), Arvind Kumar et al[21] (68.73%) Gahlot Shribhagwan et al[28] (57.5%), Vinay Kumar M. S. et. al[29] (50%) (2017) and Murali Mohan et al[30] this finding contradict with N. Bapaya reddy et al[10]; in that study most common injured part was thorax(73%) followed by abdomen (49%) then on third position was of head injury(47%).after that the number of cases of hemorrhagic shock was significant, which was 40.37% of total. These findings consistent with Murad Zafar Marri et. al[31] in that study head injury (42.20%) and hemorrhagic shock (32.60%) are leading cause of death. Very few died due to spinal shock, chemical peritonitis and traumatic asphyxia, whose percentage share was 1.08%, 0.54% and 0.54% respectively.

Table 3: Distribution based on fractured bone

Fractured bone	No. of cases n=369	%
Any of bone	317	85.90%
Skull	181	49.05%
Limbs	151	40.92%
Ribs	122	33.06%
Face	43	11.65%
Pelvis	33	8.94%
Spine	11	2.98%

In the above Table no. 3, distribution of the fracture of bone has shown. Out of 369 cases, there were 317 (85.90%) such cases in which at least one bone was found to be fractured, this was a large proportion. Skull bone fracture was found in 181 cases (49.05%) out of 369 cases. These finding consistent with as most common fractured bone is skull in Aiman Khursid et al[22] (53%), Arvind et. al.[21] (69.63%), Murali Mohan et al[30] (75.07%) and Chandra Hasini B.R.[32] (70.7%) and it contradict with N. Bapaya Reddy et. al[10] in that study most common fracture was involve to ribs(63.3%).

Table 4: Distribution based on injury to vital organ

Injured Vital Organ	No. of Cases N=369	%
Any of vital organ	329	89.15%
Brain	244	66.12%
Liver	102	27.64%
Lung	70	18.97%
Spleen	38	10.29%
Kidney	11	2.98%
Intestine	6	1.62%
Heart	6	1.62%

Injury to vital organ is found in 329 cases (89.15%) of the total cases shown above. In 244 (66.12%) cases out of 369, brain injuries have been found in the form of contusions, lacerations or hemorrhages. 189 cases were of Intra cranial hemorrhages. Most common intracranial hemorrhage was subarachnoid hemorrhage (129 cases, 34.95%) followed by sub Dural hemorrhage (123, 33.33%)in our study which is consistent with Murali Mohan et al[30] (SAH;53.52% and SDH;19.13%) and contradict with Vinay Kumar M.S. et al[29] (SDH;69.5%) and Chandra Hasini B.R.[32] (SDH;92.6%, SAH;82.4%) Liver was the most common organ injured thoraco-abdominally which has shown in 102 cases (27.64%) of total. Consistent with the findings of N. Bapaya Reddy et al[10] (32.65%), contradict lung with Chandra Hasini B.R.[32] in which were most commonly affected (29.9%) followed by liver (25%). In our study Lung injuries found in 70 cases (18.97%). Depict in table no. 4

Conclusions

The government can set laws and enforce them, but we are the ones who drive on the road in the end. Accidents are an issue that may be avoided, and it is critical to intervene before they occur. We require a trauma centre that is well-equipped and trained, as well as a secure and quick ambulance service. RTAs have a high fatality rate. This mostly results in the loss of society's most capable members, and it must be halted. This research will help us learn more about the fatality rates of various physical traumas. This study will assist us in gaining a better understanding of the fatality rate of various bodily traumas. It could be a step forward in helping us save a precious life. The government's project "Good Samaritan" is a great one. There is a training programme at SMS MC Jaipur to teach the general public how to perform CPR. There is a well-equipped teaching lab that

is also useful for doctors. The road transportation department provided the entire fund for it. The key to preventing it is raising awareness. At the end, "late by accident."

Ethical clearance: Taken from institutional ethics committee of SMS Medical College Jaipur

Source of funding: Self

Conflict of Interest: RTA is now established problem of society; we need to work on it to decrease the death toll.

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