Pattern of common injuries in road traffic accidents

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Abstract
Road accidents kill large number of people and it is as 'war on the roads'. According to a WHO report, the number of road traffic deaths continues to climb, reaching a high of 1.35 million in 2016 is the 8th leading cause of death for all age and is the leading cause of death for children and young adults.[1] It worse, 80 per cent of these deaths and injuries take place in the developing countries. Road traffic accidents have got multi-factorial causation. The time taken between the accident and reaching the hospital is critical and that is a very important lacuna in providing medical aid to the victims. There are no good mobile ambulance services and well-run trauma centers available except few.

After institutional ethical clearance for the study, study was carried out at Mortuary of Dept of Forensic Medicine, GGS Medical College, Faridkot. It is prospective study. All the dead bodies brought for postmortem examinations during the period Jan 2011-Dec 2017 were analyzed. The detailed analysis of these cases was based on the inquest report, medical records, and evaluation of autopsy reports.

Out of 1518 medico legal autopsies studies during the study period, 33.66% were of vehicular accident fatalities with commonest vulnerable age group is 20-30 years 28.96%, with preponderance of 91% males and majority were of 71% rural residence of which 41.09% were hospitalized. Brain injury 56.61% in majority location of internal organ injury on the body. With regard to musculoskeletal injuries topped the list of injuries of RTA in all age groups of victims involving the limbs 46.97%. Wounds are produced which are in combinations of abrasion, contusion, lacerations and fracture dislocation seen majority of cases. The most common cause of death was Injury to brain 52.05%, maximum 45% died within one hour of the incidence.

Road traffic accidents continue to be a speedily rising problem, causing heavy loss of manpower and resources. Road users should be properly trained by authorized centers and driving licenses should be issued after strict testing of the driving skills. Trauma centers with integrated facility of surgical, orthopedic, neurosurgical and anesthetic experts with modern investigative procedures like USG and CT scan and facility of blood bank is the best solution for RTA victims who are severely injured.

Keywords: Road traffic accidents, pattern of injuries, Head Injury, Sub Dural Hematoma.

Introduction
The high mortality and morbidity associated with road traffic injuries is a major public health problem worldwide. Every year, road traffic accidents kills an estimated 1.2 million people and injures about 50 million people per year globally. The World Health Organization estimates that road side accidents could rise to 2.4 million by 2020, with 85% of this increase being in low- and middle-income countries, road accidents are at present No 9 on the list of causes of death and morbidity and it is projected that by 2020, it will the No 3 killer in the world and No 2 in the developing countries.[1] More people will be dying of accidents than of malaria, tuberculosis, diarrhoea and cancer. Scientists have worked relentlessly for the cure and prevention of diseases like smallpox, polio, tuberculosis, malaria, heart attacks and cancer, but no effort worth mentioning is being made against the epidemic of road accidents. India has had the unconvinced division of high rates and a steady increase in road fatalities over the past three decades. According to National Crime Records Bueuruo, 51 cases of RTAs took place very one hour during 2015, wherein 16 persons were killed. During 2014, a total of 4, 50,898 cases of RTA were reported which rendered 4,77,731 persons injured and 1, 41,526 deaths. Deaths due to RTAs in the country have increased by 2.9% during 2014 [1,77,526] over 2013 [1,37,423].[3] These numbers translate into one road accident minute and one road accident death every four minutes, which is the highest in the world. About 1.47 lakh people get killed in road accidents every year. However, this is an underestimate, as not all injuries are reported to the police.[4]

The deaths due to road accidents in Punjab is nearly six times higher than the deaths caused by homicides. According to a report circulated by the Government of India, Ministry of Road Transport and Highways, another disturbing trend has come to light, Punjab leads a majority of the states in the severity of road accidents. For every 100 accidents there are 64.3 fatalities in Punjab, which are two to three times more than the figures of Kerala (11.3), Karnatka (20.7) and Maharashtra (17.3).[5]

Materials and Methods
The present study was carried out at Mortuary of Dept of Forensic Medicine, GGS Medical College, Faridkot. All the dead bodies brought for postmortem examinations during the period Jan 2011-Dec 2017 were analyzed. The detailed analysis of these cases was based on the inquest report, medical records, and evaluation of autopsy reports.

Only those cases were selected which had definite history of road traffic accidents. A detailed analysis of the pattern and incidence various injuries sustained by RTA victims was carried out. The study was approved by the institutional ethical committee.

Results and Discussion

Out of 1518 medico legal autopsies studies during the study period, 511 [33.66%] were of vehicular accident fatalities. The commonest vulnerable age group is 20-30 years 148[28.96%] followed by 41-50 years 97[18.98%] Table 1.

The sex distribution of deaths due to Road traffic accidents was higher 465[91%] in males. The distribution on bases of residence 71% were of rural and 29 % were of urban and 210[41.09%] were hospitalized.

As per location of internal organ injury on the body brain injury was the commonest 287[56.16%] followed by injury to lungs 143 [27.98%] Table 2.

The commonest variety of hemorrhages in brain injury found was subdural hemorrhage [SDH] 69[24.04%] followed by extradural hemorrhage [EDH] 52[18.12%], subarachnoid hemorrhage [SAH] 12[4.18%] and least with 154[10.14%] deaths due to laceration of brain. The hemorrhages are 181 [63.06%] associated with fractures of skull. The dominant type of skull fracture found was fissured fracture in 51[28.17] % cases followed by linear fracture 27 [14.92%] and least were comminuted fracture 18[9.94%].

In this study, as per location of skull fracture in majority basilar fractures were seen in 214[41.88%], and followed by skull vault fractures in 143[27.98 %] and in majority of cases 249 [48.73%] both the vault and base were fractured or both, especially in the thin areas temporoparietal bone.

With regard to pattern of injuries, musculoskeletal injuries topped the list of injuries of RTA in all age groups of victims. While the majority of injuries on limbs 240[46.97%], head & face 163[31.90%], chest 82 [16.05%] and abdomen 26[5.08%]. Multiple injuries of soft tissue & bony injuries among different types of road users. Wounds are produced which are in combinations of abrasion, contusion, lacerations and fracture dislocation seen majority of cases.

The most common cause of death in road traffic accidences was Injury to brain 266 [52.05%] followed by hemorrhage and shock due to multiple injuries was 133[26.03%] and least were injury to vital organs 112 [21.92%].

The most of the victims of RTAs maximum died 230[45%] within one hour of the incidence and on spot 174[34.06%] and 107[20.94%] have survive for few days after getting good medical and surgical treatment.

Table 1: Age Distribution of Road Traffic Accident Cases

Age in years	No of cases	Percentage %
0-10	15	2.94
11-20	41	8.03
21-30	148	28.96
31-40	92	18
41-50	97	18.98
51-60	72	14.09
61-70	21	4.11
>70	25	4.89

Table 2: Distribution of Injury to Internal Organs in Road Traffic Accidents

Internal Organ	No of Cases	Percentage %
Brain	287	56.16
Spinal Cord	19	3.73
Lungs	143	27.98
Liver	41	8.02
Spleen	21	4.11

Discussion

Bad driving, alcohol use, bad roads, vehicle defects are frequent factors responsible for RTAs. In the present study, out of 730 victims of RTAs, 91% were males. Jha G *et al.* [6], Ganveer and Tiwari[7], Khajuria *et al.*[8] and Moharamzad *et al.*[9] also reported similar results in their respective studies.

Most common affected patients in the present study were between 21-30 years. Ganveer and Tiwari[7] found majority of victims (75%) in the age group of 18-37 years. Khajuria *et al.*[8] observed 53.01% victims of RTA were between 20-40 years of age. Tendency of this age group of 20-40 years to show scarce attention to traffic rules & regulations and nonuse of safety devices like helmets, seatbelts, restraints etc. can be a possible explanation for the same. This shows that the people of the most active and productive age group are involved in RTA, which adds a serious economic loss to the community .These are consistent with authors.[3,4,10,11]

In the present study, the incidence of injuries due to RTA was higher in males than females. Males are the main bread earners in the Indian families so spend lots of their time in travelling and various outdoor activities, greater exposure on streets, so they are prone to accidents. These are similar to studies conducted by others. [3,4,10,11]

In the present study, most common site of injury was to Brain, followed by lungs. Jha *et al.*[6] reported head injuries in one-third of victims, followed by injuries to the lower limbs and face in their one year study on 726 victims of RTAs. Singh *et al.* [12] in their study found that when counted together, extremity injuries were present in 78.5%, head in 77.6%, and chest in 44% and abdomen in 31.8%.

The commonest variety of intracranial hemorrhage found was subdural hemorrhage [SDH] followed by extradural hemorrhage [EDH], subarachnoid hemorrhage [SAH] and least was laceration of brain.Which is in line with other studies also.[13-16]

With regard to pattern of injuries, musculoskeletal injuries topped the list of injuries of RTA was more frequent on limbs followed by head and face, chest and abdomen. These consistent with other studies.[14,17]

In this study the commonest cause of death was injury to brain followed by hemorrhages and shock due to multiple injuries and least was injury to vital organs. Which are consistent with studies conducted by authors.[11,18,19]

In this study the victims of RTAs maximum died within one hour of the incidence followed by on spot and rest have survive for few days after getting good medical and surgical treatment. The time of survival of head injury victims varies

as per the severity of trauma and also health care services provided to the patients. Similar observations are made by authors.[13- 17, 20,21]

As per location of skull fracture, in this study, basilar fractures followed by skull vault fracturs and in majority of cases both the vault and base were fractured or both, especially in the thin areas temporoparietal bone. These are consistent with other studies.[22]

Conclusion

The problem of deaths due to Road traffic accidents is speedily rising problem, causing heavy loss of manpower and resources, along with equivalent drain of potential economic growth, so a multi-dimensional approach is the need of the hour. This includes maintaining existing roads, improving road surfaces, removing obstacles, constructing proper signs and widening of the narrow sections of the roads. Hospitals along the highways should be equipped with experienced surgical team. Trauma centers with integrated facility of surgical, orthopedic, neurosurgical and anesthetic experts with modern investigative procedures like USG and CT scan and facility of blood bank is the best solution for RTA victims who are severely injured.

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References

1. WHO Global status report on road safety 2018, Available from: https://www.who.int/violence_injury_prevention/road_safety_status/2018/GSRRS2018_Summary_EN.pdf 7.12.19
2. United Nations Decade of Action for Road Safety 2011-2020. Available from: http://www.decadeofaction.org.3.6.19
3. National Crime Records Bueuro India: ADSI 2015 Full report.PDF.2.6.19
4. Rajesh DR, Kaur B, Singh A, Venkateshan M, Aggarwal OP. Pattern of Injuries due to Fatal Road Traffic Accidents in Rural Haryana: An Epidemiological Survey. *JIAFM* 2012;34(3):229-32.
5. Punjab's Lawless Roads by eabhi200k on *10 July, 2012* https://railenquiry.in/forum/punjab%E2%80%99s-lawless-roads-t-7181.3.6.19
6. Jha N, Srinivasa DK, Roy G. Injury pattern among road traffic accident cases: A study from South India. *Indian J Comm Med*. 2003;28:85-90.
7. Ganveer GB and Tiwari RR. Injury pattern among non fatal road traffic accidents: A cross-sectional study in central India; *Indian J Med Sci* 2005;59:9-12.
8. Khajuria B, Sharma R, Verma A. A profile of the autopsies of road accident victims in Jammu. *J Clin Diag Res* 2008;2:639-42.
9. Moharamzad Y, Taghipour H, Firoozabad NH. Mortality pattern according to autopsy findings among traffic accident victims in Yazd, Iran. *Chinese J Traumatol* 2008;11:329-34.
10. Kaul A, Sinha U.S, Pathak Y.K, Singh A, Kapoor AK, Sharma Set al. Fatal Road Traffic Accidents , Study of Distribution, Nature Type of Injury. *JIAFM* 2005;27(2):71-5.
11. Singh B, Palimar V, Arun M, Mohanty MK. Profile of Trauma related Mortality at Manipal KUMJ 2008;6(23):393-8.
12. Singh H, Dhattarwal S, Mittal S. A review of pedestrian traffic fatalities. *J Indian Acad Forensic Med* 2007;29(4):55-8.
13. Sharma D, Singh US, Mukeerji S.A. Study on road traffic accidents in Anand –Gujarat, Health line .2011;2(2):12-5.
14. Gopal B K, Ahamed A, Ahamed F, Tonse S.B. Pattern of Skull Fractures due to Blunt Force. *JKAMLS* 2015;24(2):27-31.
15. Ravi Kumar R R. An autopsy Study of Patterns of Skull Fractures in Road Traffic Accidents Involving Two Wheelers. *JKAMLS* 2014;23(1):9-14.
16. Rupani R, Varma A, Rathore S. Pattern of Skull Fractures in Cases of Head Injury by Blunt Force. *Indian Acad Forensic Med* 2013;35(4):336-8.
17. Singh YN, Bairagi KK, Das KC. An Epidemiological Study of Road Traffic Accident Victims in Medico Legal Autopsies. *JIAFM* 2005;27(3):166-9.
18. Katageri S, Sharma R, Govindaraju HC, Singh A K. Pattern of Injuries in Road Traffic Accidents at Chitradurga Karnataka: An Autopsy Based Study. *J Indian Acad Forensic Med* 2015;37(2):172-5.
19. Garbarino S, Nobili L, Beelke M. The Contributing Role of Sleepiness in Highways Vehicle Accidents. Sleep 2001; 24:203-6.
20. Singh D, Moorthi K, Singh S P, Goel S. Profile of Road Traffic Fatalities in Adults - A 40 Year Study in Chandigarh Zone of North West India. *Indian Acad Forensic Med* 2014;36(1):47-51.
21. Dandona R, Mishra A. Deaths due to road traffic Crashes in Hyderabad City in India. Need for strengthening Surveillance. *Natl Med J India* 2004;17:74-9.
22. Shankar V, Venkateshan M. Pattern of Injuries Due to Fatal Road Traffic Accidents from Rural Chennai. *Online Int J Med Soc Sci* 2015;1(2):30-6.

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