Roads Traffic Accidents : An Epidemiological Study of Road Traffic Accidents in Tertiary Care Hospital

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ABSTRACT

Background: Road Traffic Accident (RTA) is growing public issue and fall among four top causes of mortality and morbidity. Many people (of all age groups), die daily during playing in streets or travelling on roads. Main causes of these accidents are lack of driving skills, distracted and prolonged driving, use of intoxicants, use of mobile phone during driving, defective roads, over loading and inadequate government administrative structure. These accidents are predictable and largely preventable through multi-disciplinary coherent strategies. **Objective:** To study epidemiological factors, compliance with traffic rules and pattern of accidental injuries. **Methods:** This study is descriptive cross sectional, carried out at DHQ Hospital Faisalabad. The data was obtained from patients of RTA arriving at Accident & Emergency Department (Trauma Center), from 1st January 2016 to 30th June2016. During this period 583 patients of RTA were reported to this center. The study variables were socio demographic, human, environmental and time factors. Statistical analysis was done in percentages, linear / logarithmic trends and chi-square test to know strength of association between these variables. **Results:** Among total 583 RTA cases, male victims were 449 (77.02%) and female 134 (22.98%). Majority of cases 256(43.91%) were in age group of 15-29 years. Victims of RTA from rural areas were 194 (33.28%) while 389 (66.72%) were from urban / sub-urban areas. People from low economical strata were 198 (33.96%), moderate 310 (53.17%) and victims with illiteracy level were 135 (23.16%) and having education up to school were 304 (52.14%). Human factor, cell phone user were 29 (4.97%). Victims observing traffic rules were 93 (15.95%) while only 17 (30.19%) practiced PPM. Human factor regarding casual attitudes was observed in 47 (8.06%) cases. Maximum accidents occurred during office/school & market opening / closing timings i.e. 08-00 to 12-00 hours, 180 (30.87%) with fatality 27 (04.63% of this time events & 24.12% of total fatality) and 12-00 to 16-00 hours 136 (23.33%) with 4.29% fatality of total events & 22.32% of total fatality). Fatality was maximum during evening, 35 (6.00%) of evening RTA's & 31.25% of total fatality. Environmental factors, worst weather was observed in 35 RTA's (6.00%), narrow and repairable roads shared in 69 cases (11.84%) while in old repairable vehicles were 17 (2.92%). RTA in two wheeler vehicles/one wheeler were 271+59=330 (56.60%), in auto rickshaw (three wheeler) 106 (18.18%) and in pedestrian 85 (14.58%). Pattern of head injury was found in 72 RTA's (12.35%) while limb injuries 76 (13.04%). Mortality occurred in 112 (19.21%) cases while mild to severe morbidity was observed in 471 (80.79%) cases. **Conclusion:** This study concluded that male youth shared major portion of RTA victims. Morbidity and mortality was high in riders of two wheelers and in persons having head injuries. All the contributory factors were largely preventable through multi-pronged approach.

Keywords: Pakistan/ Faisalabad, Trauma Center, Road Traffic Accidents, Epidemiological study, Risk Factors, Traffic Rules, Outcomes.

INTRODUCTION

Accidents are ignored veritable major epidemics of non-communicable disease in the present century. They rank 4th in causes of mortality and represent about 08% of all the deaths in the world.[2] A WHO

advisory group defined accident as "unpremeditated event resulting in recognizable damage while Road Traffic Accidents refer to any accident involving at least one vehicle, occurring on a road open to public circulation in which at least one person is injured or killed, intentional acts and natural disasters are excluded.[1,3] About 1.25 million people die every year as a result of road traffic crashes.[4] Road traffic injuries are the leading cause of death among young people aged 15-29 years. 90% of the world's fatalities on the roads occur in low and middle income countries and half of those dying on the roads are "vulnerable road users" pedestrians, cyclists and motorcyclists. The newly adopted 2030 agenda by WHO for Sustainable Development Goals(SDG's) has set an ambitious road safety target of halving the global number of deaths and injuries from road traffic crashes by 2020.[4] About 20-50% or more people suffer from non-fatal injuries and many incurring a disability as a result of their injury. Road Traffic injuries cause considerable economic losses to victims. 3-5% loss of their GNP has been suggested in research carried out in 2010.[4] There is prediction that by 2020 the traffic disability adjusted years lost will be the third leading cause globally and second cause in developing countries.[5] In WHO (2009) report, in Pakistan 25.3 deaths per 100,000 occur due to road traffic injuries being much higher than international rates.[6] According to WHO Fact sheet (2011) more than 90% world mortalities on the roads occur in low income and middle income countries.[7] Pedestrian, passengers and riders of two wheelers/one wheelies are common victims. So far no study has been conducted in this area, that's why this study has been carried out.

METHODOLOGY

Study Setting: This descriptive cross sectional study was conducted at Accident and Emergency Department DHQ Hospital, Faisalabad which is referral tertiary care teaching Hospital affiliated with Punjab Medical College Faisalabad.

The study participants were victims of RTA who reported to this center during 1st Jan 2016 to 30th June 2016.During this period 583 RTA cases were reported.

Case definition: Any accident involving at least one road vehicle, occurring on a road open to public circulation and in which at least one person is injured or killed, intentional acts and natural disasters are excluded.

Case inclusion and exclusion criteria: The RTA involved persons who were reported to A&E department after the occurrence of accident during study period and consented to give information about accident were included while non willing persons were excluded from this study.

Study variables:

Data collection /Statistical methods: A pre-tested/ethical committee approved pro-forma was used. The study variables included were, epidemiological data, vulnerable road users, time/day of accident, pattern/severity of injury, type of road/vehicle and result outcome. The data of 583 RTA victims was collected personally. Statistical analysis for all study variables regarding means, percentages and frequencies was done using EXCEL & SPSS version15 software. Chi- square test and test of proportions were also used for analysis and comparison. The value of P <0.05 was taken statistically significant.

RESULTS

1-Socio-demographic profile: In total of 583 RTA cases 256 (43.91%) were in age group of 15-29 years. The male involved in RTA cases were 449 (77.02%) and female 134 (22.98%). The victims of RTA from rural area were 194 (33.28%) & urban/sub-urban area 389 (66.72%). The persons from low/middle socio-economic group were L 198 (33.96%) & M 310 (53.17%) while school educated were 304 (52.14%) as compared to graduates 144 (24.70%). The illiterate were 135 (23.16%) Detail is shown in table-1.

Table 1: Socio demographic details

Age Groups	Gender		Literacy Level			Domicile		Socioeconomic Status		
	Male	Female	Sch	Gr	Ilt	Rural	Urban	L	M	H
00-14 years	49	19	43	00	25	13	55	36	23	09
15-29 years	214	42	123	83	50	93	163	76	145	35
30-44 years	99	29	66	39	23	49	79	39	75	14
45-59 years	66	27	54	17	22	26	67	28	53	12
60->60 years	21	17	18	05	15	13	25	19	14	05
Results	449	134	304	144	135	194	389	198	310	75

2- Accidental Injury / Fatality Pattern:

a- Severity and site of injury: Among total of 583 RTA cases 72 (12.31%) were with head injuries. While 76 (12.99%) had injuries of limbs especially shoulder, clavicle and knee joints. 27 (04.62%) RT cases were with injuries of chest and abdomen. Among total RTA's, 112 (19.15%) were fatal.

b- Days and time of injury: In total cases of RTA under study, 180 (30.77%) no of accidents took place at 08.00 to12.00 hours and 136 (23.25%) during 12.00 to 16.00 hours. These were School/work place going and leaving timings. Maximum fatality was 35 (05.98%) in 65 cases during 16.00 to 20.00 hours probably due to poor visibility in the evening. Details are shown in table 2 & 3.

Table 2: Accidental timings / Fatality pattern

Timing Hour	Accidents-f	Non-Fatal	Fatal	Fatality % n
00-04 am	68	59	09	01.54%
04-08	43	39	04	00.69%
08-12	180	153	27	04.63%
12-16	136	111	25	04.29%
16-20	65	30	35	06.00%
20-24	91	79	12	02.06%
Total Result	583	471	112	19.21%

*Source= A&E Department DHQ Hospital Faisalabad 2016.

Table 3: Accidental Injury Pattern

Vehicle Type	Accident= f	Head injury	Limbs Injury	Abd Injury	Non-Fatal	Fatal %
Motor cycle	271 46.48%	53	31	03	207	64 10.98%
Auto	106 18.18%	00	06	08	099	07 01.20%
L Vehicles	043 07.38%	00	05	05	037	06 01.02%
H Vehicles	011 01.89%	00	00	01	008	03 00.51%
Carts	008 01.37%	00	00	00	008	00 00.00%
Cycles	059 10.12%	11	21	06	040	19 03.26%
Pedestrian	085 14.58%	08	13	02	072	13 02.23%
Total	583	72 (12.35%)	76 (13.04%)	25 (04.29%)	471 (80.79%)	112 (19.21%)

*Source- A&E Department DHQ Hospital Faisalabad 2016.

3-Human factors in RTA:

A- Casual Attitudes / Distract Driving: Among total RTA study cases, the RTA victims showing casual attitudes/ distract driving in total RTA cases were 47 (07.86%).

B- Observance of Personal Protection Measures: In total study cases, only176 (30.09%) practiced PPM during driving.

C- Observance of Traffic Rules: Among total RTA victims, 93 (15.90%) were found to comply with traffic rules.

D- Use of Cell Phone during Driving: Among total 583 RTA study cases, 56 (09.57%) were engaged in phone listening during the occurrence of accident.

E- Types of victims: Among total RTA study cases, pedestrians road users were 85 (14.58%) with fatality 13 (2.23%), riders of two wheelers /one wheelers were 271 (46.48%) with fatality 64 (10.98%), auto riksha's /tri wheelers were 106 (18.18%) with fatality of 07 (1.20%), cyclists were 59 (10.12%) and fatality 19 (3.26%), regarding four wheelers, light vehicles were involved in 43 (7.38%) cases with fatality 06 (1.02%) while heavy vehicles were reported in 11 (1.89%) with fatality 06 (1.02%) and horse/donkey carts were involved only in 08 (1.37%) without any fatality.
Details are shown in table 4.

4-Environmental Factors:

A- Weather: This study showed that 35(05.98%) RTA's occurred during rainy/misty &worst weather.

B- Distance covered in old repairable vehicles: 17 (02.91%) RTA's occurred in old repairable vehicles, mostly at the end of the journey probably due to inadequate vehicle performance, fatigue and exhaustion.

C- Road condition: Repairable /narrow roads shared in 69 (11.79%) cases.

D- Traffic/staff/signals condition: Absence of traffic staff/signals were found in 93(15.90%) cases.

E- Repairable Vehicular condition: 17 (%) accidents occurred due to old repairable condition of the vehicles.
Details are shown in table 4.

Table 4: Human and environmental factors

Human Factors	Frequency	% of n	Environmental Factors	Frequency	% of n
1-Practicing of PPM	176	30.19%	1-Worst Weather	35	06.00%
2-Compliance to T Rules	93	15.95%	2-Worst Road Condition	69	11.84%
3-Casual Attitudes	47	08.06%	3-Non-Existing T Signals	93	15.95%
4-Users of Cell phone while driving	56	09.61%	4-Repairable Vehicular Condition	17	02.92%
Result					

*Source- A&E Department DHQ Hospital Faisalabad 2016.

All discussed variables are significantly associated with Road Traffic Accidents.

DISCUSSION

This study shows that the most common group involved in RTA's is from urban area, predominantly male 15-30 years young age group (%), having low literacy level and belong to low and middle socio-economic class. This study is comparable with 1st road traffic injury surveillance in Karachi done by Shehzad in 2011,[8] study carried by Insurance Institute for road safety also verified the fact that teen age drivers (16-19 yrs) are three times more likely responsible for fatal accidents than those above this age[9] and with study carried at VS Hospital Ahmadabad India, where mean age of presentation /other RTA victims was 36 years (maximum in age group 21-30yr i.e, 22.67%, among them 80.67% were male, 61.33% were two wheel riders while auto rickshaw riders were 16.67% and pedestrian were 14.67%.[10] The results of these variables are very near to the results of our study. In Hong Kong the pedestrian death rate in RTA's is 70% while in China, Malaysia and Thailand it is 10-15%.[11] The fatality rate of this study in two wheel drivers conforms to results of studies carried in other Asian countries.[12,13] This study is also consistent with study done by M Sied in Ethiopia regarding gender and age group,[14] study by Etehad H regarding two wheel riders and age group,[15] study by Hong K[16] & by Zhang G in Korea,[17] in respect of age group and long distance while study conducted by De Sousa TB in Korea,[18] is not consistent with this study due to study in multivariate model. The results of studies done in neighbor country Iran by Kambiz Masoumi[19] and Fatehmeh Pashaei Saber[20] also mimic this study. So the results of this study are consistent with results of national and international studies.

Limitation of study: This is single center study having limited data, so results are not applicable for whole population.

CONCLUSION

This study revealed that RTA's were more common in younger age group, male gender, middle/low socio economic strata, vulnerable road users, riders of two wheelers/old aged over loaded vehicles, persons with casual attitudes, non-compliers of traffic rules & road safety measures, users of cell phones during driving, at repairable narrow roads while mortality was more common in patients suffering from head injuries. The fatalities and injuries from road traffic crashes can be reduced/ minimized through strengthening road safety, improving emergency health care services, reducing hospital reach time through fast ambulance service and by improving government administrative structure.

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