

Causes and Factors in Road Traffic Accidents at a Tertiary Care Center of Western Uttar Pradesh

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Abstract

Road Traffic Accidents are one of the leading causes of morbidity and mortality in the world. The etiological factors may be classified into human and environmental out of which human factors are much more responsible for number of accidents. This study was carried out on Road Traffic Accidents cases reported to casualty department of Muzaffarnagar Medical College, Muzaffarnagar (U.P) from 1st July 2016 to 30th June 2017. The main objectives of the study were to know the causes and factors responsible for the accidents. Data were collected and analyzed. A Total of 416 cases were included in the study. Human error is responsible for accidents in 78% of cases in which drivers were at fault in 57.0% of cases followed by the pedestrians and passengers of vehicles who were responsible for 18% and 3.0% cases respectively. Faults in vehicles and poor weather accounted for accidents 8.0% & 7.8% of total cases respectively. Bad roads were responsible for accidents in 4.0% of total cases. None of the driver or passengers of the vehicles was wearing helmets or seat belts which are a very alarming trend. The important human factors responsible for accidents were over speeding, rash driving, violation of traffic rules, carelessness, wrong crossing, playing on roads, alcohol intake, fatigue or sleepiness.

Keywords: - Road traffic accidents, Causes, Risk factors, Human error, Drivers.

Introduction

Road Traffic Accidents are one of the leading causes of morbidity and mortality in the World. WHO data show that in 2016 nearly 1.35 million people died worldwide as a result of Road Traffic Injuries. However, the rate of death relative to the size of the world's population has remained constant.¹ In 2002, Road Traffic Injuries were the ninth leading cause of disability-adjusted life years (DALYs) lost, accounting for over 38 million (DALYs) lost, or 2.6% of the global burden of disease. Low and middle income countries account for 91.8% of the DALYs lost to road traffic injuries worldwide. According to WHO data for 2002, Road Traffic Injuries accounted for 2.1% of all global deaths and ranked as

the 11th leading cause of death. These road traffic deaths accounted for 23% of all injury deaths worldwide. Road traffic injuries constitute a major public health and development crisis and are predicted to increase if road safety is not addressed adequately.² A total of 4,64,674 road accident cases were reported during 2015. Road accident cases in the country have increased by 3.1% (4,64,674 in 2015 from 4,50,898 in 2014) during 2015 compared to 2014. The fatalities in road accidents have increased by 5.1% (from 1,41,526 in 2014 to 1,48,707 in 2015) during 2015 over 2014. It is observed that rate of deaths per thousand vehicles has decreased marginally from 1.0 in 2011 to 0.8 in 2015, although the number of vehicles in the country have increased by 28.6% (from 1,41,866 in 2011 to 1,82,445 in 2013) and the quantum of road accidents has increased by 5.6% during same period.⁴ 64,674 road accidents caused 1,48,707 deaths and injuries to 4,82,389 person during 2015. Generally road accidents have caused more injuries than deaths but in Punjab and Uttar Pradesh road accidents caused more death compared to persons injured.³ Accidents constitute a complex phenomenon of multiple causation.

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The etiological factors may be classified into two broad categories human and environmental.⁴ The present study was conducted to explore the various causes and factors responsible for RTAs for better prevention and management of Road traffic accidents.

Material & Method

The present study was conducted in the department of Forensic Medicine at Muzaffarnagar Medical College, Muzaffarnagar a tertiary care teaching hospital from 1/7/2016 to 30/6/2017. During this period a total of 416 cases of Road traffic accidents were reported to casualty department. This study was a prospective study. The relevant data was collected from casualty medical officer, treating doctor, police, relative accompanying the patients and from case files. In few cases adequate information was not obtained and such cases were put under unknown group. A detailed Performa was prepared for filling the observations on the present study. The information thus collected was statistically analyzed.

Observation and Result

During our study period 416 cases were admitted to the hospital with diagnosis of Road Traffic Accidents. The causes of accidents were analyzed in detail. In our study human error was responsible for accidents in 78% cases out of these drivers were at fault in 57% cases followed by pedestrians and passengers responsible for accidents 18% and 3% cases respectively. Present study showed that vehicle and weather were responsible in 8% and 7.8% cases respectively. Poor and defective roads lead to 4% of fatal accidents and in 2.2% cases the cause was unknown. (Table-1) In this study the common fault of drivers responsible for fatal accidents were due to over speeding (49.8%), rash driving (30.8%),

loss of control (6.8%), violation of traffic rules (5.5%), alcohol intoxication (4.2%), fatigue or sleepiness (2.9%). (Table-2) In present study out of 75 pedestrians responsible for accidents, 58.8% were careless in crossing roads, 20% were crossing from wrong side, and 16% of children were playing on roads and 5.2% were vulnerable due to old age and diseases. (Table-3) Out of 12 passengers responsible for fatal accidents, 50% were catching or getting down of running buses, 33.4% were travelling on foot board of buses, 8.3% were catching the buses from wrong side of the road and 8.3% of passengers were projecting outside the body of the vehicle when they fell out. (Table-4) In this study out of total 34 cases of accidents attributed to faults of vehicles, 29.8% of vehicles were overloaded or overcrowded, 26.7% of passengers ejected out of open jeeps during collision. These open jeeps are used to ferry passengers illegally. Wrongly parked vehicle on roads leading to accidents at night accounts for 17.8% cases. In this study 14.2% of vehicle has failure of brakes or steering, 8.5% had a tire burst at high speed leading to accidents due to overturning or collision with vehicles or trees. In 3% of cases, projecting loads from rear of trucks accounted for the accidents. (Table-5) Regarding the effect of the poor weather, 46.7% cases occurred at night due to poor vision and fog or mist account for 44.2% cases and 9.1% of cases due to heavy rain or storms in this study. Our study showed that out of 17 cases of accidents due to poor road condition, 34.4% occurred due to stray animals on road and 29.5% due to potholes and damaged roads. In 23.5% cases merging of rural roads directly to a highway with high speed traffic were responsible for accidents. 6.3% cases each occurred due to diversion or construction material on the road and illegal speed breakers, respectively. (Table-6)

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Table - 1 Causes of fatal Road Accidents

Causes	Cases	Percentage (%)
Human Error	324	78.0
1. Fault of Drivers	237	57.0
2. Fault of Pedestrians	75	18.0
3. Fault of Passengers	12	3.0
Role of vehicles	34	8.0
Role of Weather	32	7.8
Role of Roads	17	4.0
Unknown	09	2.2
Total (n = 416)	416	100

Table – 2 Faults of Drivers

Faults	Cases	Percentage (%)
Over Speeding	118	49.8
Rash Driving	73	30.8
Loss of Control	16	6.8
Violation of Traffic Rules	13	5.5
Alcohol Intoxication	10	4.2
Fatigue/Sleepiness	07	2.9
Total (n = 237)	237	100

Table – 3 Faults of Pedestrians

Faults	Cases	Percentage (%)
Carelessness	44	58.8
Wrong crossing	15	20.0
Playing of Roads	12	16.0
Disease	04	5.2
Total (n = 75)	75	100

Table – 4 Faults of Passengers

Faults	Cases	Percentage (%)
Catching / alighting Running Bus	6	50.0
Travelling on foot Boards	4	33.4
Catching / alighting from wrong side	1	8.3
Projecting outside the Vehicle	1	8.3
Total (n = 12)	12	100

Table – 5 Faults of Vehicles

Faults	Cases	Percentage (%)
Overcrowding / over loading	10	29.8
Ejected out of open jeeps	09	26.7
Wrongly Parked on Road	06	17.8
Failure of Brakes / Steering	05	14.2
Tire Burst	03	8.5
Projecting loads	01	3.0
Total (n = 34)	34	100

Table 6 – Factors related to Roads

Faults	Cases	Percentage (%)
Stray Animals on Road	6	34.4
Potholes / Damaged Road	5	29.5
Merging of Rural Road with Highway	4	23.5
Diversions / Material on Road	1	06.3
Illegal Speed Breakers	1	06.3
Total (n = 17)	17	100

- **Conflict of interest:** Nil.
- **Source of Funding:** Self-funded.
- **Ethical Permission:** Institutional ethical committee.

Discussion

Road Traffic Accidents are mainly caused by the rapid increase in vehicles on roads, personalized modes of transport, lack of road discipline and improper roadway features. India accounts for about 10% of road accidents fatalities world wide and 85% of all road accidents occurred in the developing countries.² In the present study road traffic accidents accounted for 416 cases. The factor of human error is found to be most significant (78%) as compared to defects in vehicles, roads or weather conditions similar to other study.^{6-9,13} The drivers were at fault in 57% of cases & were responsible

for over speeding in 49.8% cases, rash driving in 30.8% cases. Violation of traffic rules, alcohol intake, fatigue or sleepiness were other causes.^{7,8} Pedestrian comprising of elderly & children are most commonly affected group of road accident victims. Majority of them are themselves responsible for accidents due to carelessness (58.8%), Wrong crossing (20%), children usually playing on roads (16%) and diseases in elders (5.4%).^{8,9,13} The common faults of passengers were catching running bus (50%), travelling on foot boards (33.4%), catching from wrong side (8.3%) and projecting outside the vehicle (8.3%).^{7,8,13} In the cases of accidents attributed to faults of vehicles, 29.8% of vehicles were overcrowded or over loaded, in 26.7% of cases victim ejected out of open jeeps at the time of collision. A small number of vehicles had mechanical failure in form of steering or brake failure (14.2%) or tire burst (8.5%) at high speed.^{6,7,13} Poor weather condition like night or poor vision (46.7%), fog or mist (44.2%), heavy rain or storm (9.1%) responsible for accidents which is consistent with other studies.^{7,13,14} Factors related to roads like stray animals on road (34.4%), potholes or damaged road (29.5%), merging of rural road with highway (23.5%) and diversions or material on road (6.3%), illegal speed breakers (6.3%) were responsible for accidents. Findings are consistent with other studies.^{7,14} The most disturbing finding in the present study was that none of the drivers and passengers of motor bikes or four wheelers were wearing helmets or seat belts leading to fatal injuries.¹⁰⁻¹³

Conclusion

The tragedy of Road Traffic Accidents is that they particularly involve young, perhaps the young and adventurous ones more. Human error is the most common cause of road accidents out of which drivers are at fault in many cases, followed by faults of pedestrians and passengers. The defects in vehicles, poor road infrastructure and poor weather accounts for a smaller number of cases. Fatal accidents represent not only tragic family loss but also a serious economic loss to the community as their education and training have been wasted. Such incidences can be prevented by giving proper education, awareness, training of safety standards by administrators and law enforcement agencies. There should be road safety programmes regularly in which all the cities of our country must be ranked and sensitized on the basis of various criteria like standards of roads, functioning of traffic signals, obeying of traffic rules by the citizen etc.

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