

Original Research Paper

Fatal Road Traffic Accidents: Causes and Factors Responsible

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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 factor account for 90% of the accidents. The present study was conducted to know the causes and factors responsible for the accidents. Human error is responsible for accidents in 77% of cases in which drivers were at fault in 56.2% of cases followed by pedestrians and passengers of vehicles responsible for 17.8 and 3.0% cases respectively. Defects in vehicles, poor weather accounted for accidents in 8.4% cases respectively and bad roads were responsible for accidents in 4% cases only. None of the driver or passenger of the vehicles was wearing helmets or seatbelts, a very disturbing trend. The important human factors responsible for accidents were, over speeding, rash driving, not following traffic rules, carelessness while crossing roads, playing on road, alcohol intake, fatigue and sleepiness.

Key Words: Road traffic accidents, Causes, Risk factors, Drivers, Human error

Introduction:

Road Traffic Accidents (RTAs) are one of the leading causes of morbidity and mortality in the World. WHO data show that in 2002 nearly 1.2 million people worldwide died as a result of road traffic injuries In addition to these deaths; between 20 million and 50 million people globally are estimated to be injured or disabled.

RTAs are the eighth leading cause of death in the World and are expected to rise to the fifth position by year 2030, if adequate measures are not taken. [1]

Road traffic injuries accounts for 38 million disability adjusted life years (DALYs) lost or 2.6% of global burden of disease.

Low and middle income countries accounts for 91.8% of the DALYs lost to road accident injuries worldwide. [2] In India 1, 37, 423 fatalities occurred as a result of RTA in 2013 which accounted for 36.4% of all accidental deaths in the same period. [3] There is steep rise in vehicular accidents in the present era due to urbanization and tremendous growth in the road transport sector.

Accidents constitute a complex phenomenon of multiple causation. The etiological factors may be classified into two broad categories- human and environmental. [4]

Road accidents continue to be a growing problem worldwide. Up to 90% of the factors responsible for causation and prevention of accidents are attributed to human factors. [5] The present study was conducted to find out various causes and factors responsible for RTAs so as to evolve strategies to prevent and better manage road traffic accidents.

Material and Methods:

The present study was conducted in the Department of Forensic Medicine at Pt. B. D. Sharma PGIMS Rohtak in year 2001. All the cases of death due to RTAs were included in the present study. During the period of study, a total of 450 road accidents deaths were subjected to medico-legal autopsy.

Necessary information for the study was gathered from police, inquest report and interview of relatives and friends of victims and eye-witnesses present at the time of accidents.

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 Results:

A total of 1510 bodies were brought for post-mortem examination out of which 450

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cases (29.8%) were due to road accidents. The causes of accidents were analyzed in detail.

In our study Human error was responsible for accidents in 77% cases out of these drivers were at fault in 56.2% cases followed by pedestrians and passengers responsible for 17.8 and 3% deaths respectively.

Present study showed that Vehicle and weather were responsible in 8.4% cases each. 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 faults of drivers responsible for fatal accidents were due to over speeding (49.4%), rash driving (31.6%), loss of control (6.8%), violation of traffic rules (5.5%), alcohol intoxication (4.3%) fatigue and sleepiness (2.4%). (Table 2)

In present study out of 80 pedestrians responsible for accidents, 58.8% were careless in crossing roads, 20% were crossing from wrong sides, and 16.2% of children were playing on roads and 5 % were vulnerable due to old age and diseases. (Table 3)

Out of 13 Passengers responsible for fatal accidents, 46.2% were catching or getting down of running buses, 38.4% were travelling on foot board of buses, 7.7% were catching the buses from wrong side of the road and 7.7 of passengers were projecting outside the body of the vehicle when they fell out. (Table 4)

In this study out of total 38 cases of accidents attributed to faults of vehicles, 28.9% of vehicles were overloaded or overcrowded, 28.9% 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 15.8% cases.

In this study 13.2% of vehicle has failure of brakes or steering, 7.9% had a tyre burst at high speed leading to accidents due to overturning or collision with vehicles or trees. In 5.3% cases, projecting loads from rear of trucks accounted for the accidents. (Table 5)

Regarding the effect of poor weather, 44.7% cases occurred at night due to poor vision and due to fog or mist respectively and 10.6% of due to heavy rain or storms in this study. (Table 6) Our study showed that out of 18 cases of accidents due to poor road condition, 33.3% each occurred due to stray animals on road and potholes and damaged roads respectively. In 22.2% cases merging of rural roads directly to a highway with high speed traffic were responsible for accidents. 5.6% cases each occurred due to diversions or construction material on the roads and illegal speed breaker, respectively. (Table 7)

Table 1: Causes of Fatal Road Accidents

Causes	Cases	Percentage
Human Error	346	77.0
1. Fault of Drivers	253	(56.2)
2. Fault of Pedestrians	80	(17.8)
3. Fault of Passengers	13	(3.0)
Role of Vehicles	38	8.4
Role of Weather	38	8.4
Role of Roads	18	4.0
Unknown	10	2.2
Total (n=450)	450	100

Table 2: Faults of Drivers

Faults	Cases	Percentage
Over speeding	125	49.4
Rash Driving	80	31.6
Loss of Control	17	06.8
Violation of Rules	14	05.5
Alcohol intoxication	11	04.3
Fatigue/ Sleepiness	06	02.4
Total (n=253)	253	100

Table 3: Faults of Pedestrians

Faults	Cases	Percentage
Carelessness	47	58.8
Wrong Crossing	16	20.0
Playing of Roads	13	16.2
Disease	04	05.0
Total (n =80)	80	100

Table 4: Faults of Passengers

Faults	Cases	Percentage
Catching / alighting Running Bus	6	46.2
Travelling on Foot Boards	5	38.4
Catching / alighting from wrong side	1	7.7
Projecting outside the Vehicle	1	7.7
Total (n=13)	13	100

Table 5: Faults in Vehicles

Faults	Cases	Percentage
Overcrowding / over loading	11	28.9
Ejected out of open jeeps	11	28.9
Wrongly Parked on Road	06	15.8
Failure of Brakes / Steering	05	13.2
Tyre Burst	03	7.9
Projecting loads	02	5.3
Total (n=38)	38	100

Table 6: Factors related to Weather

Faults	Cases	Percentage
Night / Poor vision	17	44.7
Fog / Mist	17	44.7
Heavy rain/ Storm	4	10.6
Total (n=38)	38	100

Table 7: Factors related to Roads

Faults	Cases	Percentage
Stray Animals on road	6	33.3
Potholes / Damaged Road	6	33.3
Merging of Rural Road with Highway	4	22.2
Diversions / Material on Road	1	05.6
Illegal Speed Breakers	1	05.6
Total (n=18)	18	100

Discussion:

India accounts for about 10% of road accidents fatalities worldwide and 85% of all road accidents occurred in the developing countries. [2] In the present study road accidents

accounted for 29.8% of all medico-legal post-mortem in one year period.

The factor of human error is found to be most significant (77%) as compared to defects in vehicles, roads or weather conditions similar to previous studies [6-9] The drivers were at fault in 56.2% of cases and were responsible for over speeding in 49.5% cases, rash driving in 31.6% cases. Violation of traffic rules, alcohol intake, a fatigue and sleepiness were other causes. [7, 8]

Pedestrian comprising of elderly and children are most commonly affected group of road accident victims. Majority of them are themselves responsible for accidents due to carelessness, not following traffic signs, old age and diseases and children usually playing on roads. [8, 9] The common faults of passengers were catching or getting out of buses from wrong side or running buses, travelling on foot boards or projecting out of the vehicles. [7, 8]

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. [10-12] In the cases of accidents attributed to faults of vehicles, 28.9% of vehicles were overcrowd/overloaded and in 28.9% of cases victims ejected out of crowd open jeeps at time of collision. A small number of vehicles had mechanical failure in form of steering/ brake failure or tyre burst at high speed. [6, 7]

Poor weather conditions like night or poor visibility, fog, mist and heavy rain/storm and defective roads are other factors responsible for accidents. Findings of our study are consistent with others. [7, 13]

But the increased number of accidents at night or early morning hours is due to alcohol intoxication, rash driving, fatigue and sleepiness of drivers. The problem of accidents in darkness is not a matter of visibility but a consequence of the way drivers use roads at night. [13]

On a larger scale, the main cause of accidents on Indian roads is a chaos created by mixing of slow and fast moving traffic on the same roads. This is due to infrastructure shortage and lack of effective public transport system to keep pace with rapid and substantial increase in demand so the passengers are turned to personalized mode of transport or intermediate public transport as autos, taxis and jeeps which further add to traffic congestion. [2, 14]

Conclusions:

The problem of road traffic crashes and injuries is growing both in absolute number and relative term. Human error is the most common

cause of road accidents out of which drivers are at fault in more than three-fourth of 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. Road safety is a multispectral and multidimensional issue requiring a multipronged approach at various levels. The important steps required to improve road safety for road uses are:

1. Training and Education of Road Users:

- Promote the road safety at school.
 - Training of drivers and driving instructor.
 - Training of engineers on road safety.
 - Training in first Aid- drivers of buses and trucks should be trained in basic first aid.
 - Training of the traffic police for better traffic management.
2. Strengthen the system of driving license to improve competence of drivers.
 3. Strict implementation of traffic rules and Safer road infrastructure.
 4. Fitment of safety features in vehicles at the stage of designing, manufacturing, usage, operation and maintenance.
 5. Ensure safety of vulnerable road user by segregating slow and fast moving traffic.
 6. Ensure emergency medical attention for road accident victims.

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