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**Original article**

# Alcohol intoxication and road traffic accident fatality, Assam

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**Abstract**

Research Question: What is the fatality pattern among alcohol consumed Road traffic accident (RTA) victims in comparison to their counterparts?. Methods and material, Setting- Study was conducted in Gauhati Medical College and Hospital, Guwahati, Assam. Study design- Descriptive study Participants-106 Drivers and 140 Pedestrians, predesigned-pretested schedule was used. Study variable- RTA victims consumed alcohol and not consumed alcohol at the time of RTA. Statistical analysis- percentage, chi square test. Observation and Result: Overall 19.81% drivers and 5.72% pedestrians consumed alcohol at the time of RTA, 71.42% of the drivers consuming alcohol (under influence at the time of accident) were fatally injured. Whereas only 8.23% drivers not consuming alcohol met a fatal accident, difference found was statistically significant ($X^2 = 5.27$, df = 1, $P< 0.05$). While, 12.5% pedestrians, who consumed alcohol at the time of RTA was fatally injured in comparison to 8.33% pedestrians not consuming alcohol, difference found was statistically insignificant, ($X^2 = 0.611$, df = 1, $P>0.05$). Conclusion: Drivers are more prone to get indulge in drinking as compared to pedestrians and a drunk driver is more likely to die in a RTA, though same can not be stated for pedestrians. Based on the current study vulnerability of pedestrians cannot be totally ruled out and will need further research.

**Keyword**: Drivers, Pedestrians, Alcohol.

## Introduction

Alcohol is a major risk factor for Road traffic accident (RTA), as it impairs judgment and increases the possibility of involvement in other high risk behaviours (e.g., speeding, violating traffic rules, etc.). It also affects vision and poses difficulties in identifying risks and dangerous situations in the road environment; imbalances appropriate coordination for maneuvering the vehicle; diminishes reflexes and affects psychomotor performance and delays reaction time to light and hearing[1,2]. It is also accompanied by physiological changes such as increased fragility of bones and greater vulnerability to severe injury and resulting recovery[3].

Alcohol has been found to be the largest single factor leading to fatal crashes. Use of alcohol by drivers and pedestrians, as estimated leads to some 25,000 deaths and a total of at least 800,000 crashes in the United States alone each year [4]. The situation is same in Canada and the Western Europe. In Western Europe about half of the road traffic fatalities occur because of drunken drivers. In Great Britain in the year 2007, it was estimated that 14,480 casualties (6 per cent of all road casualties) occurred when someone was driving whilst over the legal alcohol limit [5].Studies in South Asia indicate that



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nearly 30-40% of crashes occur at night and significant numbers of them are due to alcohol consumption[6].

According to World Health Report[7], at least 10 thousand million people throughout the world regularly use alcohol. India has also been deeply affected where the intake of alcohol has so permeated into the culture that it is no longer acknowledged as a drug or even as a problem. In the research report of the Bureau of Police Research and Development, Ministry of Home Affairs, Govt. of India (1978), drivers were reported to be primarily responsible for fatal accidents (34%), being drunk at the material moment. Chronic alcoholics are especially dangerous and make up the bulk of the drunk drivers in fatal road traffic accidents. In spite of police and legislative campaigns against driving under influence of alcohol, the annual increase in motor vehicle deaths continues. Rehabilitation efforts in treating drunk drivers have not yet been proven effective.

The present study was conducted with the following objectives:-

1. To find out the role of alcohol as a factor in RTA fatalities among drivers and pedestrians.

2. Suggest recommendations based on the findings.

**Materials and Methods**:

Study design: hospital based descriptive study

Place of study: Gauhati Medical College and Hospital, Guwahati, Assam.

Period of study: 2011 - 2012

Study population:-Study population includes-

1. RTA victims sustaining various injuries and attending surgery, orthopedics and ENT OPD and Casualty department of Gauhati Medical College.
2. Death cases resulting from RTA and undergoing autopsy in postmortem section of Forensic medicine department of Gauhati Medical College, after being registered through casualty or through OPD.

Sample size:

A total of 246 Road Traffic Accident victims (including 106 drivers and 140 pedestrians) who reported to GMCH during the study period were included in the study.RTA victims: To serve the purpose of current study only 'drivers' and 'pedestrians' have been considered as RTA victims.If alcohol has to be related to road traffic accidents then the victims must be those who were active at the time of accident i.e. drivers and pedestrians

Pedestrian: "Any person involved in accident, who at the time of accident was travelling by foot on a street but, was not riding in or on a vehicle".

Driver: "the occupant of the vehicle operating it or intending to operate it, at the time of accident". Consent of the participants was taken and they were made fully oriented about the nature and intention of the study. Data were collected in pre designed pre tested schedule. Preferably RTA victims were interviewed and where not possible help from attendants and relatives were taken. Road traffic fatality was defined as 'when a person dies outright or within 30 days of a RTA[8].'Determination of alcohol intake by the RTA victims was based on patient's case sheet or postmortem report. In the present study blood alcohol concentration could not be assessed.



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**TABLE I : General characteristics of RTA victims**

| Age wise distribution of RTA victims | | |
|---|---|---|
| Age group in years | Drivers | Pedestrians |
| 5-15 | 2(1.88) | 11(7.86) |
| 15-25 | 25(23.59) | 28 (20) |
| 25-35 | 30(28.3) | 43 (30.72) |
| 35-45 | 24(22.64) | 28 (20) |
| 45-55 | 16(15.1) | 22 (15.71) |
| 55-65 | 9 (8.49) | 8 (5.71) |
| Sex wise distribution of RTA victims | | |
| Male | 93 (87.74) | 104 (74.29) |
| Female | 13 (12.26) | 36 (25.71) |
| Total | 106 (100) | 140 (100) |

**TABLE II : Drivers and pedestrians under influence of alcohol at the time of accident**

| Alcohol Intake | Drivers | Pedestrians |
|---|---|---|
| Yes | 21 (19.81) | 08 (5.72) |
| No | 85 (80.19) | 132 (94.28) |
| Total | 106 (100) | 140 (100) |

The difference was statistically significant, i.e., P< 0.01

**Table III:Fatality among drivers according to their intake of alcohol at the time of accident**

| Alcohol Intake | Drivers | | Total |
|---|---|---|---|
| | Fatal | Non fatal | |
| Yes | 15(1.42) | 06 (28.57) | 21 (100) |
| No | 07 (8.23) | 78 (91.76) | 85 (100) |

The difference was statistically significant, i.e., P< 0.05

**Table IV:Fatality among pedestrians according to their intake of alcohol at the time of accident**

| Alcohol Intake | Pedestrians | | Total |
|---|---|---|---|
| | Fatal | Non fatal | |
| Yes | 01 (12.5) | 07 (87.5) | 08 (100) |
| No | 11 (8.33) | 121 (91.66) | 132 (100) |



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The difference was statistically insignificant, i.e., P > 0.05

**Results**

On analysis of the collected data it has been noted that majority (29.67%) of RTA victims were in the age group of 25-35 years. Majority (80.08%) were males. Male: Female ratio found to be 4:1. (Table I) . Overall 19.81% drivers and 5.71% pedestrians were under the influence of alcohol at the time of road traffic accident and the difference was marked and found statistically significant ($X^2$ = 11.53, df = 1, P< 0.01),(table II). Table III shows that out of the drivers who were under the influence of alcohol at the time of RTA 71.42% met a fatal accident in comparision to their counterparts with no alcohol suffering 8.23% fatality, difference was found to be significant, ($X^2$ = 5.27, df = 1, P < 0.05). Table IV shows that 12.5% of fatally injured pedestrian were under the influence of alcohol in comparison to 8.33% fatally injured counterparts. On statistical analysis however the difference was insignificant, ($X^2$ = 0.611, df = 1, P>0.05).

**Discussion**

Males (80.08%) outnumber females (19.92%) as RTA victims in present study with a ratio of 4:1.This finding is in conformity with studies done across the country[9, 16]. In our country males are more actively involved in outdoor activities as compared to females, this explains their over representation as RTA victims. The result further reveals that 19.8% of the drivers had consumed alcohol at the time of RTA. Jha N and his co-workers[9] found 14.9% of drivers consumed alcohol at the time of RTA which is more or less similar to the present study.

Mohan D and Bawa PS[10] in their study in Delhi on Road traffic accident found that 1/3rd of the drivers involved in RTA were under the influence of alcohol, this high percentage may be because the findings are of metro city like Delhi with greater vehicle density on the roads with more number of drunk drivers increasing the accident probability manifold. While Mishra B and co workers[11] in their study in western Nepal noted that 46.3% of drivers were under drunken state at the time of RTA, this high percentage may be because of the fact that the intake of alcohol was considered based on smell of alcohol in breath while in the present study case sheet or postmortem report were the basis of alcohol consumption. The maximum legal Blood Alcohol Concentration (BAC) limit shows a wide variation ranging from 30-70 mg% in different countries. There is a wide disparity in legal control on public consumption of alcohol and it calls for a uniform law in the line of Framework Convention for Tobacco Control[12].In the present study BAC could not be assessed.

Fatality and intake of alcohol by drivers:-

As shown by result of the present study, out of all the drivers who consumed alcohol at the time of accident 71.42% sustained fatal injuries. From an investigation of studies conducted in low-income countries[17], it emerged that alcohol was present in between 33% and 69% of fatally injured drivers, and in between 8% and 29% of drivers involved in crashes who were not fatally injured. Similarly Peden M and co workers[14] found that alcohol was a factor in around 29% of non-fatally-injured drivers, and in over 47% of fatally-injured drivers in South Africa.



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These findings are again in accordance with the findings of present study where high percentage of alcohol intoxicated drivers met fatal accident while low percentage of non alcohol intoxicated drivers met fatal accident.Mishra B and co workers[11] also noted that 84.37% of drivers who took alcohol at the time of accident succumbed to their injury which again is more or less in accordance with the findings of the present study.Among the pedestrians under the influence of alcohol intoxication at the time of RTA, 12.5% met fatal accidents in comparison to only 8.33% of their counterparts who met fatal accidents. Though the difference was found to be statistically insignificant, Van der spuy JW[14] stated that in South Africa injury to the drunken pedestrian accounts for 72% of adult traffic death. Further WHO, world report on road traffic injury prevention stated that alcohol is a well documented risk factor in pedestrian road traffic crashes in developed countries.

**Conclusion**

From the present study it could be concluded that out of the people actively travelling on road after consuming alcohol, majority of them are driving a vehicle in comparison to walking, this is alarming, because this put the life of other road users at great risk. On the other hand the fatality of RTA is high among drivers who are under the influence of alcohol at the time of the accident (drunk drivers are more likely to die in comparison to normal drivers) and its adverse effect on the pedestrians could not be ruled out and will need further research. Need of the hour is to take some strong action against those road users found indulged in alcohol.

The crucial need, from public health perspective, is to consider some legislations especially for the hazardous (or pre-dependence stage) use of alcohol, a recommendation suggested also by the WHO[15] .The traffic police need to be equipped with alcohol breath analyzer and periodic check post should be set up at random places within the city and in highways and their vigilance on duty should be ensured through supervisory visits by the higher officials. A strict enactment of law is needed particularly for the drivers as with the steering in hand of a drunk driver turns the vehicle nothing less than a lethal weapon.

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