Original Research Paper

A Study of Incidence of Alcohol Use In Fatal Road Traffic Accidents

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Abstract

Road Traffic accidents (RTAs) are a leading killer in India snatching valuable human resources resulting in undefined economic and social loss. A leading cause for this malady is alcohol consumption and subsequent misadventure on the road which not only harms him but also the poor ones on the road. Though the co relation between the two is well known, we have been unable to tackle this menace. The present study was carried out with a view to analyze the incidence of alcohol consumption among the victims of road traffic incidents brought for autopsy to the Department of Forensic Medicine, GMCH, Guwahati. We found that males are most exclusively involved in accidents following alcohol consumption with 20-29 age group most affected. Majority of the victims were lowly educated and were pedestrians or riders of two wheelers. The mean BAC is found to be 167.28 mg/dl. Concrete steps needs to be taken starting from Government intervention to public awareness to prevent this harmful occurrence.

Key Words: Alcohol Consumption, RTA, Males, BAC

Introduction:

India is a rapidly growing country in a phase of transition with increased urbanization, industrialization, and motorization. With such a rapid pace of progress accidents are a reality waiting to happen. Death in the accidents is an inescapable fact and so is the influence of alcohol in the same. Road traffic accidents (RTA) cause largest number of injuries and fatalities worldwide by killing around 1.2 million people each year and injuring 50 million. [1]

The total number of deaths every year due to road accidents has now passed the 135,000 mark, according to the latest report of National Crime Records Bureau (NCRB). [2] The NCRB report further states that drunken driving is a major factor for road accidents. It is reported in India that 25 % of fatalities in road traffic accidents occur due to drunken driving.

Changing social norms, urbanization, increased availability, high intensity mass marketing and relaxation of overseas trade rules along with poor level of awareness related to alcohol has contributed to increased alcohol use.

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Sale of alcohol in India has been growing steadily at 6% and is estimated to grow at the rate of 8% per year. About 80% of alcohol consumption is in the form of hard liquor or distilled spirits showing that the majority drink beverages with a high concentration of alcohol. [3]There is progressive loss of driving ability as blood alcohol concentration increases due to increase in reaction time, false confidence, impaired concentration and decreased visual and auditory acuity.

In India maximum permissible limit of blood alcohol concentration is 30 mg% but unsafe consumption of alcohol mixed with driving not only puts the individual in harm but also the co passengers of the vehicle and also the unfortunate ones in the road.

The concentrations of alcohol in blood and other body fluids are highly correlated, and both measurements are widely used as evidence to prove the over-consumption of alcohol in Forensic and legal medicine.

Thus a systemic study of these cases in matters like population profile, time of incident, place of occurrence, cause of death, blood alcohol concentration involved etc. enables us to evaluate different aspects of alcohol related traffic incident deaths.

Aims and Objectives:

1. To evaluate the causes and other contributing factors leading to death in Road traffic incidents with alcohol consumption.
2. To study the level of alcohol present in body by analysis of blood

Materials and Methods:

The study was conducted in victims of fatal road traffic accident cases brought to mortuary of Gauhati Medical College and Hospital for medico-legal autopsy from 1st July 2013 to 30th June 2014. Various data were collected like age, sex, occupation, religion, date and time of crash, type of vehicle, type of road user and history of alcohol intake was taken and noted in a specially designed proforma.

Blood samples were collected from femoral vein. [4] About 10 ml of blood was collected by a sterile syringe in glass capped bottles containing sodium fluoride as preservative. The blood samples were quantified by gas liquid chromatography. Victims of RTA cases with hospital stay greater than 48 hours have been excluded from the study.

Observation and Results:

A total number of 3034 autopsies were carried out during the study period of which deaths due to road traffic accidents have been attributed to 952 cases. Out of these 952 cases 188 cases had evidences of alcohol in their blood constituting nearly 20% of total accidents involved. (Table 1) In this study out of total 188 cases, males were the most exclusively involved with 186 cases and only two female cases were noted. (Table 2)

In the present study, the age of the victims varied from as low as 16 years to as high as 71 years. (Table 3)It was observed that the age group between 20 to 29 years of age contained the highest number of cases, 72 (38.30%) closely followed by the age group between 30 to 39 years of age with 60 cases(31.91%). (Table 3) Regarding occupation 30.85% were businessman followed by cultivators and those engaged in private jobs. 23 students were also involved in our study. (Fig. 1)

Majority of the victims were lowly educated with the highest number of cases involved being of those who were under matric (35.64%), primary educated (13.30%) or illiterate (5.85%). Only 10.1% of cases were of those who were graduates or higher. (Table 4)

For the study the 24 hours of the day has been divided into four categories of 6 hour each and the data analysis showed that most of the incidents occurred in the evenings 6pm-12 midnight (45.21%) and afternoons (41.49%) in our study. (Table 5) Present study showed that pedestrian with 60 cases (31.91%) constituted the highest number of involved victims followed by those riding a motor cycle with 51 cases (27.13%). (Table 6)It was observed that before the accident alcohol was consumed over at a friend's home, 59 cases (31.38%) followed by at one's own place with 42 cases. 30 cases had consumed alcohol in commercial institutions like bar, dhaba and local country shops. (Table 7)

In our study the Blood Alcohol Concentration of 68 cases (36.17%) was above 201 mg/dl with 38 cases (20.21%) and 36 cases (19.15%) between 51-100 mg/dl and 151-200 mg/dl respectively. Least number of cases is observed between 0-50 mg/dl.

The mean BAC is found to be 167.28 mg/dl. (Fig. 2) Of the cases, 185 of them exceeded the permissible BAC which is 30 mg/dl. Only 3 cases had BAC less than the allowed limits. (Table 8)

Discussion:

It was observed that nearly 20% of the victims had evidences of alcohol present in their body at the time of the accident. These findings are similar to other studies [5, 7], which showed involvement of alcohol in 20-25% of cases.

However National Center for Injury Prevention and Control, US [8] found alcohol as culprit in nearly 40% cases.The high involvement of males in the study is consistent with the findings of others. [5, 9, 10] It is observed that the age group between 20 to 29 years of age contained the highest number of cases, 72 (38.30%) closely followed by the age group between 30-39 years of age.

These findings are consistent with other authors work. [9, 11-13] But in contrary Ahlner J et al [14] and Rao Y et al [7] found 41-50 as the most commonly involved age group.

The reason behind involvement of the younger age group is that they are most actively involved in occupation and hence are most ambulatory and use alcohol as a means of recreation. Less involvement of the extremes of age is thus self- explanatory as they tend to remain indoors and avoid alcohol.

In the study of the cases involved 58 victims (30.85%) were businessman followed by cultivators and those engaged in private jobs. 23 students were also involved in our study. This can be attributed to the fact that these people are commonly mobile and have easy access to alcohol leading to accidents. The victims were mostly lowly educated with the highest number of cases involved being of those who were under matric (35.64%), primary educated (13.30%) or illiterate (5.85%). This can be attributed to the reason that people with grater educational background are more vigilant to the surroundings and avoid risk taking behavior.

However people with low educational background are usually not well employed and

have to move around for better prospects making them more likely to meet with anaccident.Highest number of cases occurred between 6pm-12 midnight and 12 noon -6pm and least number of cases was seen in the interval between 6am-12 noon.

These findings are similar with the findings of Jani C B et al [9] and Rao Y et al [7] who indicated higher incidence of cases in evenings and nights.However the study differs with the findings of Arora P et al [12] who indicated maximum crashes during day time.

This can be due to the fact that more number of people returns from their place of work and activity at that time. Also alcohol consumption mostly takes place after one has completed their daily chores. This coupled with fatigue of the whole day and the urge to reach home quickly leads to more number of crashes in the nights and evenings.

Pedestrians with 60 cases (31.91%) constituted the highest number of involved victims also drivers of various vehicles and the pillion rider in case of two wheelers. The drivers both of two wheelers, three wheelers, four wheelers etc. are commonly involved along with pedestrians. Passengers of cars are less commonly involved. [6, 10, 12, 15]

Pedestrians being the most common victims can be explained by the fact that under the influence of alcohol they lack the general traffic sense which ultimately proved fatal.

Further the absence of proper footpaths and well defined crossing sections makes them more vulnerable to accidents. Drivers implicated is due to the reason that under the influence of alcohol there is a decrease in driving ability and reaction time which leads to more careless driver behavior and subsequent accidents.

Consumption of alcohol before accident took place over at a friend's home in 31.38% cases followed by at one's own place.

Significantly 30 cases had consumed alcohol from commercial places like bar, dhaba and illegal liquor stores. 29 cases had consumed alcohol over at a relative house.

This can be attributed to the reason that alcohol is taken usually at a social gathering to celebrate a particular occasion or festival along with friends and relatives in the confines of one's own residence. However commercial institutions which serve alcohol are more located in the outskirts of the region and the highway which increases the risk of accidents.

The Blood Alcohol Concentration of victims shown in our study was similar to the other studies. [9, 10, 12] A high BAC leads to different manifestations leading to difference and error in judgment which leads to increased number of accidents. Also pedestrians with high BAC lose their direction sense and wander their way onto incoming vehicles leading to casualty.

Conclusion:

Drunk driving is a major problem in India and other developing regions of the world. The problem is unrecognized and hidden due to lack of good quality research data from many countries. Strict enforcement supplemented with education is one of the most powerful tools to tackle the problem in low-and middle-income countries and needs serious consideration.

Many other measures like increasing the legal drinking age, restricting the availability of alcohol by limiting timings, and controlling the unabated promotion of alcohol seems promising, but needs implementation. Many broader issues also need closer examination to develop and implement rational alcohol policies.

As such a few suggestions are advocated:

1. National information systems should be strengthened with appropriate knowledge, skills, techniques and resources to include information on driving under the influence of alcohol as an important element in road safety information systems within police and health sectors.
2. Independent studies by medical institutions should be undertaken periodically to examine the problem by both qualitative and quantitative research methods.
3. Health screening for alcohol problems should be undertaken in hospital emergency rooms among all persons with a RTI.
4. Physicians in emergency rooms should be trained to detect alcohol involvement in RTIs and use of breathalyzers should be promoted.
5. The autopsy centers in various parts of the country should be provided with their own laboratories and institutions for carrying out the blood alcohol estimations and to not only depend on the Forensic Science Laboratories for the results. This will also help the enforcement agencies in implementing the law of the land
6. The existing sections of the motor vehicles Act, which deal with drinking and driving, should be widely publicized through multimedia channels.
7. Current enforcement mechanisms should be reinforced by ensuring the availability of trained police and dedicated teams; the use of breathalyzers in a scientific manner; the introduction of random checks; an increase in current penalty levels; and to the strict

enforcement and implementation of laws in a random (geographically), visible, uniform and regular (periodically) manner.

8. Public education programmes must be specific and target oriented.

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Table 1: Alcohol and RTA involvement

Total RTA's Cases	Cases with evidence of Alcohol consumption (%)
952	**188(19.75)**

Table 2: Sex wise Distribution

Sex	Cases	Percentage
Male	186	98.94
Female	2	1.06
Total	**188**	**100**

Table 8: Victims with BAC above Legal Limits

Above legal limits	Cases	Percentage
Yes	185	98.40
No	3	1.60

Table 5: Time of Incidence

Time of incidence	Cases	Percentage
12 midnight-6am	20	10.64
6am-12noon	5	2.66
12noon-6pm	78	41.49
6pm-12 midnight	85	45.21
Total	**188**	**100**

Table 3: Age wise Distribution

Age (Yrs)	Cases	Percentage
0-9	0	0
10-19	13	6.91
20-29	72	38.30
30-39	60	31.91
40-49	36	19.15
50-59	5	2.66
above 60	2	1.06

Table 4: Educational Status of Victims

Educational status	Cases	Percentage
Primary	25	13.30
Illiterate	11	5.85
Under Matric	67	35.64
Matriculate	43	22.87
HS Pass	21	11.17
Graduate	17	9.04
Post Graduate	2	1.06
Unknown	2	1.06
Total	**188**	**100**

Table 6: Types of Victims

Victim type	Cases	Percentage
Pedestrian	60	31.91
Driver	20	10.64
Passenger	17	9.04
Motor cyclist	51	27.13
Pillion rider	21	11.17
Bicyclist	19	10.11
Others	0	0.00
Total	**188**	**100**

Table 7: Place of Alcohol Consumption before Accident

Place where taken	Cases	Percentage
Own Home	42	22.34
Friends home	59	31.38
Work Place	16	8.51
Relative house	29	15.43
Commercial	30	15.96
Not specified	10	5.32
Unknown	2	1.06
Total	**188**	**100**

Fig. 1: Occupation of the Victims

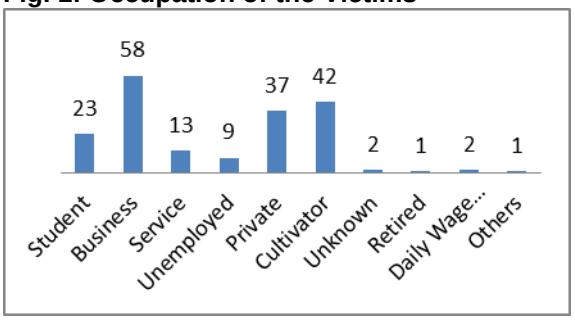
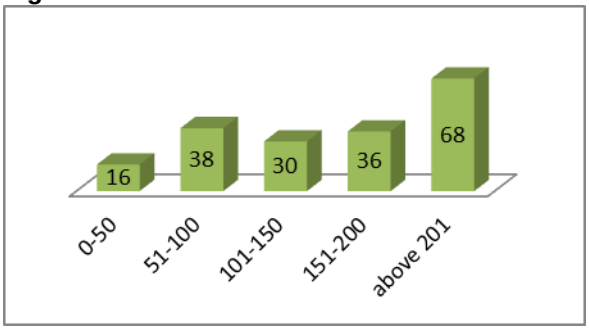
Fig. 2: BAC of Victims