

Profile of Mortalities due to Alcohol and Drug Consumption in Road and Rail Traffic Accidents in Mangaluru, a Coastal City of Karnataka, India

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ABSTRACT

Objective: Several studies have demonstrated that driving under influence of alcohol and psychoactive drugs increases the risk of fatal accidents & hence increased mortality rates. This paper presents a retrospective study of Road & Rail traffic accidents in Mangaluru.

Method: Over a six-year period (2010-2015), a total of 5226 autopsies were conducted at Govt. Wenlock Hospital, Mangaluru out of which 1261 were Vehicular accidents (1117 - Road, 144 - Rail). Various parameters were looked in these cases such as age groups, gender, type of Vehicle involved, Victim status, time of day, day of the week (weekdays/weekend), Season, type of intoxication, accident site etc.

Results: 15.85% (n = 177) of all the Road Traffic Deaths & 9.72% (n=14) of all Rail deaths occurred as a consequence of either alcohol (16.83%, n=188/191) or drug overdose (n=3). 42.93% of victims belonged to 56 and above age group. Most commonly the vehicle which were involved in accident were motorcycles (around 51.83% cases).

Conclusions: The results of this study reveals a strong positive association between the presence of alcohol and psychoactive drugs in road & rail traffic accident victims. The matter of grave concern is increasing trend of drunken driving leading to fatal accidents among adolescent age-groups especially in motorcycle vehicles.

Keywords: Road Traffic Accident, Rail traffic Accidents, Alcohol, Psychoactive drugs, Mangaluru, mortality.

INTRODUCTION

Increasing incidence of Road & Rail Traffic Accidents (RTAs) in recent decade is becoming 'hidden epidemics' across the world posing a threat to public health & national economy. It has been projected that Road Traffic Injuries will be the second most common cause of disability – adjusted life year loss in developing countries by the year 2020¹. According to the World Report on Road Traffic Injury Prevention² traffic accidents account for about 3000 daily fatalities worldwide. This requires urgent attention especially in the context of developing countries such as India, which reports highest proportion of deaths due to RTAs in South East Asia¹

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According to official statistics, a total of 4,45,468 'Traffic Accidents' were reported during the year 2008 in India comprising 4,15,855 'Road Accidents', 2,134 'Rail-Road Accidents' and 27,479 'Other Railway Accidents' (NCRB, 2009). In 2009, 4.22 lakh road traffic incidents and 1.27 lakh road traffic fatalities were reported³. These numbers translate into one road accident every minute and one road accident death every four minutes.

Mangaluru is very apt for the study because it's one of the largest coastal cosmopolitan city in South India with booming increase in vehicular traffic since past decade after declaration as Special Economic Zone (SEZ) in 2007. Four National Highways pass through the city which increases the burden on roads & Railways with added cargo traffic from the Mangalore Port. The city's landscape is characterized by rolling and hilly terrain along with 6 months of monsoon season which makes the roads prone to RTAs. The city has 2 major railway stations whose tracks pass through the interior of the city making it vulnerable for travelers and unattended wanderers⁴.

In spite of the high burden of RTAs in the country, there is paucity of systematic information on the statistics of most common contributory factors like alcohol intake & abuse of psychotropic drugs like benzodiazepines, barbiturates, cocaine, cannabis, opiate-like drugs such as heroin, methadone, morphine, amphetamines and other CNS stimulants. The growing trend of drunken driving leading to fatalities is clearly directed by this study that says Alcohol accounted for 11% to 60% of RTA fatalities^{5,6}.

The existing studies done on RTAs are just based on accident rate based on diffused parameters, results of which cannot be used to devise any prevention or protective guidelines to reduce mortality rates due to RTAs. The results of this proper multi-parametric study will yield appropriate intervention strategies to combat this 'Hidden epidemic'.

Several studies have demonstrated that alcohol and psychoactive drug consumption are important risk factors underlying fatal accidents. The main objective of this study was to find prevalence rates of alcohol and psychotropic drugs in fatalities of rail and road-traffic accidents in Mangaluru, a coastal district of South India.

This study was aimed to have an overall picture of the occurrence of these substances in the victims by

toxicological screenings. Through this study, analysis of different parameters which increases & decreases the frequency of mortalities & hence devise an effective strategy to reduce the mortality rates.

MATERIAL AND METHOD

Study design: A retrospective study conducted on incidences of Rail & Road traffic accidents under alcohol and drug intake leading to their deaths.

Study sample and Inclusion Criteria: The study enrolled only those cases who succumbed to death due to alcohol & drug abuse leading to Rail or Road traffic accident, as suggested in Police Intimation Letter 141(1,2). Those cases with history of natural death, poisoning, murder, firearms, drowning, electrocution, poisoning and health disorders were excluded from this study.

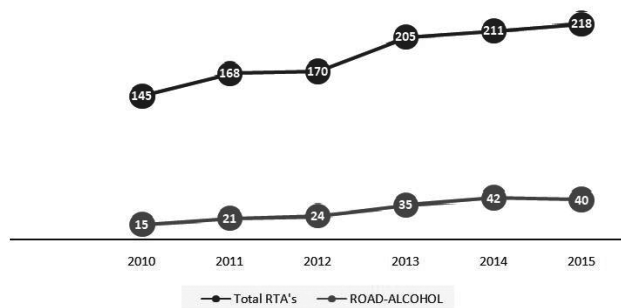
It was a time bound study from 2010-2015. The study was done only from the records of the dead bodies meeting the inclusion criteria among those received at District Mortuary, Government Wenlock Hospital Mortuary working in conjunction with Department of Forensic Medicine and Toxicology, KMC Mangalore.

Road Traffic Accident data records were sourced from Autopsies done by forensic experts in Department of Forensic Medicine and Toxicology, KMC Mangalore. The various parameters that were looked in the study were age groups, gender, type of Vehicle involved, Victim status, time of day, day of the week (weekdays/weekend), Season, type of intoxication, accident site etc.

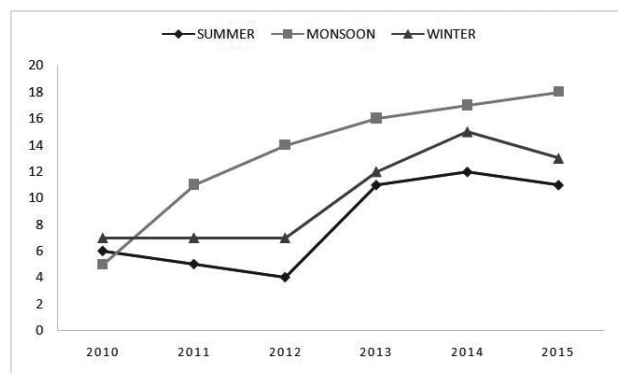
A person is said to be under the influence of alcohol when blood alcohol concentration is more than 0.03% or 30 mg/100 ml of blood, according to the Road Traffic Act (1997). During Autopsy, Blood and Visceral organ sample were collected in a sterile container with preservatives and was sent by Medicolegal consultant for determination of BAC and Toxicological screening to Regional Forensic Science Laboratory (RFSL), Mangaluru for reports indicating presence of Alcohol and illegal psychoactive drugs concentration above prescribed limit.

Statistical Analysis: Data analysis was done using SPSS (Statistical package for Social Science) version 11.5. A statistical significance was considered at p-value <0.05. Multiple Regression method was used to establish the relationship between Road Traffic Accidents with various parameters and their co-relation with alcohol & psychotropic drug intake.

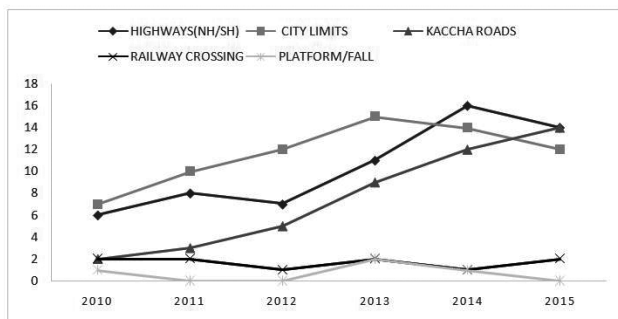
Total RTAs and RTA under Alcohol influence v/s Years.



Graph 1: Total RTAs & RTA under Alcohol influence v/s Years



Graph 2: Seasonal pattern of Accidents



Graph 3: Frequency of RTAs at different Accident sites v/s Years

RESULTS

A total of 5226 autopsies were conducted during 6 year period of 2010-2015, out of which 1261 were Vehicular accidents (1117 Road & 144 were Rail Traffic Accidents). Out of these 15.85% (n = 177) of all the Road Traffic Deaths & 9.72% (n=14) of all Rail deaths occurred as a consequence of either alcohol (16.83%, n=188/191) or drug overdose (n=3, 2 cases of Cannabis and 1 Benzodiazepine drug consumption). Graph 1.

All these cases were limited to males, of which maximum i.e. 42.93% victims were of 56 and above

years of age-group closely followed by 26-55 age group which had 33.5% deaths. Such cases in Adolescents (16-25 age group) had markedly increased over the years from 3 deaths in 2010 to 13 deaths in 2015.

Vehicular pattern showed a major share of 51.83% (n = 99) motorcycles, 18.85% Light-motor Vehicles. There were 14 cases of deaths under alcohol influence involving railways.

Almost 34.55% (n = 66) of deceased were pedestrians, who after alcohol or drug abuse were wandering around on road-sides & were fatally hit by vehicles. In 26.7 % cases the vehicle driver was drunk above legal limits which led to fatal accident. 14 cases were reported either due to rail run over/fall on tracks or crush between rail & platform. In 21.47% cases the victim was a pillion rider who succumbed to death following bike accident.

About 49.74% (n = 95) incidences occurred during night time (9pm-6am) & 31.41% (n = 60) were reported during morning hours (6am -12 pm). 65.45% cases were reported during weekdays, while 34.55 % cases occurred during weekends, which have considerably grown over the years.

Monsoon season peaked the accident rates with 42.4% (n = 81) cases, moderate & summer seasons with 61 and 49 cases respectively. Graph 2.

Maximum fatal accidents occurred within the city limits i.e. 36.65% (n = 70), then 32.46% on National & State Highways, 23.56% (n = 45)along kaccha roads, while 10 along railway crossing & 4 along tracks in case of Railway Accidents during 6 year study period. Graph 3.

DISCUSSION

This 6 year retrospective study of Road & Rail traffic accidents has shown a strong positive association between use of alcohol and its culpability to high mortality rates. Of particular interest is the increasing trend of drunken driving leading to fatal accidents among adolescent age-groups. We could not find many studies on RTA mortality rate under Alcohol & Drug influence along with the parameters under our study so elaborate review of the statistics & there findings could not be compared. Few studies similar to our setup were a 1 year (2003-2004) study on 350 RTA victim was done

by Patil et al in Maharashtra which reported that out of 129 vehicle drivers, 38 (29.5%) were under influence of alcohol. A total of 129 drivers were involved out of which there were 79 (61.2%) motorized two-wheeler drivers⁷. Alcohol was found to be very important factor in mortality in studies done during 1999-2006 and 2001-2004 on pedestrians of Slovenia & South Africa was 42.4% and 58% respectively^{8,9}. A study conducted on 1,047 fatally injured victims in the UK showed the widespread use of alcohol and drugs. Alcohol was detected in 68% of all victims. Illegal drugs were detected in 85% of the cases. Cannabinoids were found to be the most commonly detected drug⁸. In Sweden, toxicological analysis of blood samples from 1,403 drivers involved in fatal accidents were analyzed for alcohol and drugs, revealed that alcohol above the legal limit for driving (> 0.2g/L) was detected in 22% of the drivers, while drugs were found to be present in 253 cases (19%)¹⁰. A study in Tamil Nadu by Ruma et al reported 16.5 % RTA victims who attended tertiary care hospital gave history of Alcohol consumption 6 hours prior to Accident¹¹. A similar study reported by Jha N et al had reported a similar finding (16.8%).

A new rising trend of driving under influence of alcohol in motorcycle riders as well as pillion riders is a matter of grave concern. Frequency of such accidents are expectedly maximum during night hours but early morning accidents due to hangover has been emerging rapidly. Over-drinking at weekends is gradually rising over the last few years. Statistics show that city limits and highways are most accident prone areas as they allow higher speed movements which is fatal in case of drunk victims.

Railways accidents mostly occurred due to lack of boundary all along the tracks around inhabited areas, which gives an easy access to drunk people. The above statistics only includes the accident victims who succumbed to death, there are larger number of victims who acquire various vital or non-vital injuries which can adversely affect their daily life-style and have a bad impact on their future life.

Suggestions: Stronger vigilance by traffic personnel against substance abuse by deploying Sobriety checkpoints which can allow police to briefly stop vehicles at specific locations to see if the driver is impaired using breath alcohol analyzer, if police has a reason to suspect the driver is intoxicated. Such activities

should be done especially during nights & weekends which shows higher accident rates and hence increased mortality. Special efforts should be done to educate the community especially adolescent and adult age-group by organizing awareness programs regarding hazards of drunken-driving. Safeguarding of Railway premises specially tracks and deploying protection at level crossing to ensure accident free zone. Administrative license revocation or suspension laws to be put in force to allow police to take away the license of a driver who tests at or above the legal BAC limit or who refuses testing. Mass media campaigns to spread messages about the physical dangers and legal consequences of drunk driving. They are useful to persuade people not to drink and drive and encourages them to keep other drivers from doing so.

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Ethical Clearance: Institutional Ethical clearance taken

Conflict of Interest: Nil

Source of Funding: Nil

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