A Cross Sectional Study of Incidence of Alcohol Consumption in Patients Admitted with Traumatic Injury in the Department of Surgery, Maharaja Yashwant Rao Hospital, Indore

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ABSTRACT

BACKGROUND

The number of trauma cases is increasing day by day in our setup. Daily 10-15 patients of trauma came to MYH, we found that among these patients many patients have under the influence of alcohol. Alcohol consumption is the leading cause of trauma and reason for visitation to emergency department. We wanted to prospectively study the incidence of alcoholism in victims of trauma admitted in Dept of surgery, MYH Indore and correlate the severity of trauma in relation to blood alcohol concentration.

METHODS

This cross sectional study conducted at Maharaja Yashwant Rao Hospital from January 2019 to march 2020 and it includes all patients 16 years and above with traumatic injury admitted in Department of Surgery. Breath analyzer test will be done on all patients and levels will be documented.

RESULTS

In our study head injury (73.6 %) was the most common type of injury in which breath analyzer testing was found positive in 82 %,followed by burn (12.7 %) in which breath analyzer testing was found positive in 2.1 %, followed by poly trauma (4 %) in which breath analyzer testing was found positive in 4.3 %, followed by blunt trauma chest (2.4 %) in which breath testing was found positive in 2.7 %, followed by limbs (0.7 %) in which breath analyzer testing was found positive in 0.9 %.

CONCLUSIONS

In our study we have found that out of total 3105 patients history of alcoholism is present in 1420 patients while breath alcohol analyzing test positive in 2072 patients and there is significance relationship between trauma and history of alcoholism with the p value of <0.0001. We also found that significant relationship between trauma and breath alcohol analyzing testing with the p value of <0.0001.

KEYWORDS

Glasgow Coma Scale, Blood Alcohol Concentration, Road Traffic Accidents, Emergency Department, Breath Analyzer

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BACKGROUND

Now a days the number of trauma cases is increasing day by day in our setup. Daily 10-15 patients of trauma came to MYH. We found that among these patients, many patients were under the influence of alcohol. Alcohol consumption is increase day by day in our society in adult population which may be a cause of traumatic injuries. Increased blood alcohol concentration (BAC) may reduce judgement and self-mortality is higher after a trauma traffic accidents, burns or fires than that of the general population. Alcohol consumption is the leading cause of trauma and reason for visitation to emergency department (ED) (ED). Furthermore, injuries caused by alcohol are substantially more serious than injuries caused by other substances.

Alcohol consumption has been identified as a risk factor for many health, social and economic problems of communities. The recent World Health Organization (WHO) report identified alcohol as being responsible for nearly 60 types of disorders and injuries.[1] Alcohol consumption has been recognized as the fifth leading risk factor, next only to underweight, unsafe sex, blood pressure and tobacco usage.[2]

Traditionally, alcohol use has been associated with only the acute immediate effects (states of inebriation) and long-term effects (addiction) (resulting from habitual, compulsive and long-term heavy drinking). Furthermore, Alcohol has long been linked to an increase in crime, absenteeism from work, lost productivity, property destruction, and physical and emotional abuse of women and children.

The effects of alcohol depend on a number of internal and external influences. The availability, accessibility, affordability, and acceptability of alcohol have a significant impact on its use at the societal level. In terms of informing, highlighting, and directing people's values and thought processes, visual and print media play a significant role. What is determined by the legal, judicial, and welfare systems Peer group effects, the glamour associated with alcohol use, and society's liberalised attitudes have all had a significant impact on the entry of alcohol into society and its increasing levels of consumption. In terms of social, economic, and cultural values, the family is extremely important. These factors might have a beneficial or detrimental impact on the development of norms and values.

In India, alcoholic beverages are commonly categorised into six categories: (1) Indian-made foreign liquor-spirits, (2) beers, (3) wines, (4) country liquor, (5) illicit and/or home-brewed beverages, and (6) illegal and/or home-brewed beverages.

A small but growing segment of foreign-made foreign liquor. The only incidence study on alcohol use in India has been reported by Mohan et al from Delhi.[3] The annual rates of nondependent and dependent alcohol usage among men were found to be 3 and 2 per 1000 individuals, respectively, in a cohort of 2,937 homes.

Alcohol usage was considerably greater among men in the 41–50 year age range, among those with lower levels of education, and among those who were self-employed.

Alcohol consumption patterns are positively and linearly related to age. When alcohol consumption begins at a young age, it gradually escalates over time. Several studies have found that the age group of 20 – 35 years has the highest number of alcohol drinkers.

According to the National Family Health Survey, roughly 10 % of users were under the age of 25, with 15 % being under the age of 25. NFHS 3 has higher alcohol use rates in both males and females; among 15 to 19 year old males and females, it was 11.0 percent and 1.0 percent, respectively, in NFHS 3, compared to 2.4 percent and 1.0 percent, respectively, in NFHS 2.

% and 0.6 % respectively in NFHS 2. Rural people were 1.5 times more likely than urban people to use alcohol, according to the National Household Survey.[4]

Every society's drinking patterns have always been distinctive, and they are influenced by the type and amount of alcohol consumed on different occasions. The duration, frequency, type of alcohol consumed, amount drunk, and drinking scenario should all be considered when examining drinking behaviours.

Alcohol consumption is thought to be responsible for 1.8 million deaths per year (3.2 percent of all deaths) and 4.0 percent of disability-adjusted life years lost annually around the world.[7,8]

The impact of alcohol on disease and mortality is likely to be larger in countries like India, where poverty and nutritional inadequacies are more severe, and is impacted by availability and intake.[6]

Alcohol-related admissions accounted for over a fifth of hospital admissions.[10,11] Alcohol users generally report a greater frequency of ill-health. Alcohol consumption has been established as a significant risk factor for injury. Alcohol use has a wide range of effects, resulting in a number of physiological alterations.

Prominent among them are changes in respiration and circulation, difficulties in making judgement and decisions, bad vision, delayed reflexes, improper coordination, problems in risk perception issues and identification (like difficulties in identifying dangers on road), feelings of pseudo- confidence, loss of self-control and increased risk taking.[12]

Pseudoeuphoric alcohol has the effect of lowering inhibitions and increasing risk-taking behaviours (like not wearing helmets and driving at a high speed). Vulnerable persons with suicide intent are more prone to use pharmaceuticals and organophosphorus chemicals while under the influence of alcohol. Individuals become involved due to a loss of self-control and the intoxicating effects of alcohol.

Because of loss of self-control and the intoxicating effects of alcohol, individuals get involved in crime and fights and cause injury to others and to property. The physiological effects of alcohol at different levels of consumption are shown in the table below.

These factors are involved in the occurrence of both unintended (RTIs, falls, burns, poisoning, drowning, and workplace injuries) and intentional (RTIs, falls, burns, poisoning, drowning, and workplace injuries) injuries.

BAC (g/100ml)	The Body's Effects
0.01 - 0.05	Intensification of heart and respiratory rates
	Various brain centre functions are deteriorating.
	Effects on behavioural task performance that are inconsistent
	Reduced inhibitions and judgement
	Feelings of mild excitement, relaxation, and pleasure. Reduced ability to make rational decisions or use sound judgement
0.6 - 0.10	Nearly all systems are sedated physiologically.
	Reduced awareness and attention, slower responses, poor balance, and diminished physical strength are all symptoms of this condition
	Reduced ability to make rational decisions or use sound judgement
	Increase in anxiety and depression
	Decrease in patience
0.10 - 0.15	Dramatic slowing of reactions
	deterioration of balance and movement
	deterioration of some visual functions
	Slurred speech
	Vomiting, especially if this BAC is quickly reached
0.16 - 0.29	Severe sensory deterioration, including reduced awareness of external stimulation
	Severe motor deterioration, e.g. frequently staggering or falling
0.30 - 0.39	Non-responsive stupor
	Loss of consciousness
	Anaesthesia comparable to that for surgery
	Death (for many)
0.40 & greater	Unconsciousness
	less breathing
	Death, because of respiratory failure

Table 1. Impact and Output of Blood Alcohol Content on the Human Body

A survey in Delhi suggested that 45 % of vehicles were being driven by drivers who had drinked alcohol. The pub capital of India, Bangalore city, reports the highest number of road accident deaths on weekends between 6.00 p.m. and 10.00 p.m. and the police attributed it mainly to drunken driving.[13]

In roadside surveys carried out in Bangalore, 89 % of drivers stopped on suspicion of drunken driving by the police and 37 % of drivers checked randomly were breathalyzer positive for alcohol.[14]

Previous studies from emergency rooms in New Delhi estimated that 7–29 % of accident victims were under the influence of alcohol.[15,16]

But one of the severe proportions is the issue of drunken driving, as indicated by the analysis of Bathra and Bedi, who found that 40 percent of truck and matador drivers, 60 % of car drivers and 65 % of two-wheeler drivers were under the influence of alcohol while driving at night.[17]

Mohan and Bawa in an analysis of police records noticed that 32 % of pedestrian fatalities, 40 % of motorized two-wheeler occupant deaths and 30 % of bicyclist deaths occurred between 6 pm to 6 am and alcohol intoxication was a major factor in a majority of these crashes.[18]

Sahadev et al have estimated that one third of RTI deaths are associated with alcohol consumption, but are inappropriately registered in medical records.[19] A cross-sectional study of 423 victims of road traffic accidents during 1999-2000 from Nagpur recorded that 64.5 % of subjects consumed alcohol regularly.[20] In Delhi, nearly 20 % of the 550 students recorded pillion-riding with a driver who had consumed alcohol, indicating the low-risk perception of consequences due to drunken driving among teenagers.[21]

Patil from Maharastra reported that nearly 30 % of accident victims were 'under the influence' at the time of reaching hospital.[22]

Hazardous drinking is well-known to be associated with head injury and hospitalization.[23]

In a study RTIs and TBIs, it was confirmed that severe brain injuries, extent of brain injuries, mortality rates, disabilities and duration of hospital stay among victims with alcohol use is higher than those without. Almost 24 percent of participants decided to be frequent users of alcohol in the NIMHANS report on Traumatic Brain Injuries.

Two large-scale epidemiological studies on TBIs at NIMHANS have reported that nearly one-fourth of acquired brain injuries were due to falls. Among fall injuries, alcohol consumption was directly responsible for 19–22 % of falls as per the study in 2004 and 19 % during 1994.[24,25,26]

Objectives

- To estimate the proportion of alcohol users in victims of trauma admitted in Dept of surgery, MYH Indore.
- To compare the blood alcohol concentration with severity of trauma at the time of injury.

METHODS

This Cross sectional study conducted at Maharaja Yashwantrao Hospital from January 2019 to March 2020 and it includes all patients 16years and above with traumatic injury admitted in Department of Surgery, MYH. Patients managed on OPD basis and brought dead trauma patients are excluded from the study. Informed consent will be taken from all patients or their relatives included in the study. The incidence of alcohol consumption would be based on history by self or accompanying by attendants. Breath analyzer test was done on all patients and levels were documented.

The interval between trauma last consumption of alcohol was documented based on history. The principles of care were not affected by this study design and all patients were managed as per existing guidelines to optimise overall outcome. Records were maintained in the MRD section as usual. Record analysis was done at the end of study period to avoid bias. Patient identity was kept confidential.

Statistical Analysis

Data was analysed using SPSS 25.0 trial version, chi-square test, Mann Whitney U test, Kruskal Wallis test and p value <0.05 will be considered as statistically significant. Ethical clearance from the college committee was taken.

RESULTS

	GCS[¥]	N	Median	SD	P-Value
BAC	Mild	788	0.04	0.03	0.03*
	Moderate	1139	0.05	0.01	
	Severe	145	0.05	0.02	

Table 2. Distribution of Cases According to BAC, GCS, Median Values and Inter – Quartile Range

[¥]Applied Kruskal-wallis test
*indicates significant difference at $P<0.05$

		Frequency	Percentage
Gender	Male	2479	79.8
	Female	626	20.2
	Total	**3105**	**100.0**
Age	16-20	342	11.0
	21-25	514	16.6
	26-30	511	16.5
	31-35	440	14.2
	36-40	337	10.9
	41-45	259	8.3
	46-50	196	6.3
	51-55	128	4.1
	56-60	161	5.2
	>60	217	7.0
	Total	**3105**	**100.0**
Type of Injury	Head Injury (Including Maxillo Facial)	2284	73.6
	Burn	395	12.7
	Poly Trauma	124	4.0
	Stab Injury	74	2.4
	Blunt Trauma Chest	74	2.4
	Spine Injury	67	2.2
	Blunt Trauma ABD	61	2.0
	Limbs	23	0.7
	Others	3	0.1
	Total	**3105**	**100.0**
History of Alcoholism	Yes	1420	45.7
	No	1685	54.3
	Total	**3105**	**100**
Breath alcohol analyzer testing	Yes	2072	66.7
	No	1033	33.3
	Total	3105	100
Local (Desi/Undistilled) English (Distilled)	English (Distilled)	1157	55.9
	Desi (Undistilled)	915	44.1
	Total	**2072**	**100**
GCS	Mild	1335	43.00
	Moderate	1576	50.75
	Severe	194	6.25
	Total	**3105**	**100**
	Time	**Frequency**	**Percentage**
	<3	271	13.08
	3-6	1665	80.36
	>6	136	6.56
	Total	**2072**	**100**
	Parameter	**Mean ± SD**	**Min – Max**
	Age	36.70 ± 14.59	16 – 95
	GCS	12.10 ± 2.44	3 – 15

Table 3. Distribution of Cases According to Gender, Age, Type of Injury, History of Alcoholism, Type of Liquor, GCS and Time Interval between Alcohol Intake and Injury

DISCUSSION

In our study head injury (73.6 %) was the most common type of injury in which breath analyzer testing was found positive in 82 %,followed by burn (12.7 %) in which breath analyzer testing was found positive in 2.1 %, followed by poly trauma (4 %) in which breath analyzer testing was found positive in 4.3 %, followed by blunt trauma chest (2.4 %) in which breath analyzer testing was found positive in 2.7 %, stab injury (2.4 %) in which breath analyzer testing was found positive in 2.9 %, followed by spine (2.2 %) in which breath analyzer testing was found positive in 2.5 %, followed by blunt trauma abdomen (2 %) in which breath analyzer testing was found positive in 2.5 %, followed by limbs (.7 %) in which breath analyzer testing was found positive in 0.9 %. While in study done by Dr. Sreedharala Srinivasa Satynarayana et al among total injured 35 suffered severe and 23 patients suffered from critical head injury. The incidence of severe head injury was 20.9 % and critical head injury was 18.5 % in alcohol intoxicated patients whereas nonalcoholic patients the incidence of severe head injury was 20.2 % and critical head injury 11.6 %. In study by David J. Barton BS et al the head & neck injury was found in 63.7 % in alcoholic and 26.2 % in non-alcoholic, lower extremity injury was found in 18.5 % in alcoholic and 50.8 % in non-alcoholic, upper extremity injury was found in 14.8 % in alcoholic and 21.6 % in non-alcoholic, chest injury was found in 3 % in alcoholic and 0.7 % in non-alcoholic.

In our study time interval between alcohol intake and injury was found 3 - 6 hours in majority of the patients (80.36 %), followed by <3 hours in 13.08 % patients, followed by >6 hours in 6.56 % patients. In the study done by Watt. K., Purdie et al concluded that consuming any alcohol in the 6 hours prior to time of injury significantly increased risk of injury. In our study 43 % patients having mild GCS (13 - 15) in which 15.1 % patients having history of alcoholism and breath analyzer test found positive in 37.6 %, 50.75 % patients having moderate GCS (9 - 12) in which 74.6 % patients having history of alcoholism and breath analyzer test found positive in 55.3 %. 6.25 % patients having severe GCS (3 - 8) in which 10.3 % patients having history of alcoholism and breath analyser test found positive in 7 %. While in study done by Dr. Sreedharala Srinivasa Satynarayana et al in which 20 % patients with mild GCS was alcohol intoxicated, 25 % in moderate GCS and 21 % with severe GCS and 15 % with critical GCS. In study by David J. Barton. BS et al. median GCS was 15 in both alcoholic and non-alcoholic group.

In our study maximum Blood alcohol concentration was found in patients with moderate GCS. In our study time interval between alcohol intake and injury was found 3-6 hours in majority of the patients (80.36 %), followed by <3 hours in 13.08 % patients, followed by >6 hours in 6.56 % patients. In the study done by Watt. K., Purdie et al concluded that consuming any alcohol in the 6 hours prior to time of injury significantly increased risk of injury.

In our study 43 % patients having mild GCS (13 - 15) in which 15.1 % patients having history of alcoholism and breath analyzer test found positive in 37.6 %, 50.75 % patients having moderate GCS (9 - 12) in which 74.6 % patients having history of alcoholism and breath analyzer test found positive in 55.3 %. 6.25 % patients having severe GCS (3 - 8) in which 10.3 % patients having history of alcoholism and breath analyser test found positive in 7 %. While in study done by Dr. Sreedharala Srinivasa Satynarayana et al in which 20 % patients with mild GCS was alcohol intoxicated, 25 % in moderate GCS and 21 % with severe GCS and 15 % with critical GCS.

CONCLUSIONS

In our study history of alcoholism was found in 45.7 % patients and breath alcohol analyser testing was found to be positive in 66.7% patients. There is a significant relationship between history of alcoholism and breath alcohol analyser testing with the p-value < 0.0001.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
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REFERENCES

[1] World Health Organization (WHO). International guide for monitoring alcohol consumption and related harm. Geneva, 2000a.

[2] World Health Organization (WHO). The world health report 2002: reducing risks, promoting healthy life. Geneva, 2002.

[3] Mohan D, Chopra A, Sethi H. Incidence estimates of substance use disorders in a cohort from Delhi, India. Indian Journal of Medical Research 2002;115:128-135.

[4] Ray R. The extent, pattern & trends of drug abuse in India, National Survey, Ministry of Social Justice & Empowerment, Government of India & United Nations Office on Drugs & Crime, Regional Office for South Asia. 2004a.

[5] WHO. Global status report: alcohol policy. World Health Organization, Geneva, 2004b.

[6] Rodgers A, Ezzati M, van der Hoorn S, et al. Distribution of major health risks: findings from the Global Burden of Disease study. PLoS Medicine 2004;1:44-55.

[7] Isaac M. Contemporary trends: India. In: Grant M, edr. Alcohol and emerging markets: patterns, problems and responses. Taylor and Francis 1998: p. 145-176.

[8] Sri EV, Raguram, Srivastava M. Alcohol problems in a general hospital -a prevalence study. Journal of Indian Medical Association 1997;95(9):505-506.

[9] Benegal V, Murthy P, Shantala A, et al. Alcohol related problems- a manual for medical officers. Bangalore: National Institute of Mental Health and Neurosciences 2001. Publication No. 41.

[10] Gururaj, Sateesh VL, Ajith BR, et al. Bengaluru Injury/ Road traffic injury Surveillance Programme: a feasibility study. Public Health alert on alcohol. Bengaluru Injury Surveillance Collaborators group, National Institute of Mental Health and Neuro Sciences, Bengaluru, 2008. Publication No. 68.

[11] Agarwal V. Drink driving in India, The Globe, 2003;5:2. globe050:p20.html on 18th September 2008. www.ias.org.uk./publications/the/globe.

[12] Gururaj G, Benegal V. Report on Project on Prevention of Drunken Driving in Bangalore City. A collaborative project of NIMHANS with the Bangalore Action Task Force and Bangalore Police Force. 2002. http://www.nimhans.kar.nic.in/ Deaddiction/lit/dwibatf on 14th March 2006.

[13] Mishra BK, Banerjee AK, Mohan D. Two wheeler injuries in Delhi, India: a study of crash victims admitted in a neurosurgery ward. Accident Analysis and Prevention 1984;16:407-416.

[14] Adityanjee MD, Wig NN. Alcohol related problems in the emergency room of an Indian general hospital. Australian and New Zealand Journal of Psychiatry 1989;23(2):274-278.

[15] Batra VS, Bedi RBL. Effect of drunken driving on traffic safety, 2003. http://www.druglibrary.org/schaffer/ misc/driving/s26p2.html accessed on 12th July, 2006.

[16] Mohan D, Bawa PS. An analysis of road traffic fatalities in Delhi, India. Accident Analysis and Prevention 1985;17(1):33-45.

[17] Sahadev P, Lacqua MJ, Singh B, et al. Road traffic fatalities in Delhi: causes, injury pattern and incidence of preventable deaths. Accident Analysis and Prevention 1994;26(3):377-384.

[18] Tiwari RR, Ganveer GB. A study on human risk factors in non-fatal road traffic accidents at Nagpur. Indian Journal of Public Health 2008;52(4):197-199.

[19] Sharma R, Grover VL, Chaturvedi S. Health- risk behaviors related to road safety among adolescent students. Indian Journal of Medical Sciences 2007;61(12):656-662.

[20] Patil SS, Kakade RV, Durgawale PM, et al. Pattern of road traffic injuries: a study from western Maharashtra. Indian Journal of Community Medicine 2008;33(1):56-57.

[21] Poulose B, Srinivasan K. High risk behaviors following alcohol use in alcohol dependent men. Indian Journal of Medical Research 2009;129(4):376-381.

[22] Gururaj G. An epidemiological approach to prevention, pre-hospital care and rehabilitation in neurotrauma. Neurology India 1995;43(3):95-105.

[23] Gururaj G, Isaac M, Girish N, et al. Final report of the study health behaviour surveillance with respect of mental health submitted to the Ministry of Health and Family Welfare, Government of India, New Delhi, 2004a.

[24] Gururaj G, Girish N, Benegal V. Psycho- social impact of alcohol - a hidden public health burden, paper presented at the 31st annual national conference of Indian Association of Preventive & Social Medicine 27th-29th February 2004, Chandigarh.