



ALCOHOL AND INJURIES IN THE EMERGENCY DEPARTMENT IN A TERTIARY CARE CENTER IN KOLKATA, INDIA

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ABSTRACT **Introduction-** Alcoholics often report with heavy consumption patterns prior to injury, and are less likely to use healthcare services other than Emergency Departments (ED), thus making it the best place to obtain relevant information on the correlation between alcohol and injury.

Methodology- The present study was undertaken in ED of a tertiary care hospital. Consenting patients were assessed for alcohol consumption by Breath alcohol analysis (BrAC), clinical assessment and self declaration.

Results- Of the 512, 60.9% were found positive for alcohol; 56.4% were positive on self reporting, 13.4% by BrAC while 30.1% on both BrAC and self report, 21.8% on clinical assessment only.

Conclusion- Since 60% of injured patients presenting with injuries were positive for alcohol, assessment of alcohol in all patients should be used as a routine measure in ED. Self reporting of alcohol consumption should be encouraged.

KEYWORDS : Alcohol, Breath alcohol analysis, Alcohol self reporting, Injury

Introduction

Alcohol consumption has been associated with many different types of injuries from external causes, including those related to traffic, falls, burns, sports and interpersonal as well as self-inflicted violence which can affect not only the consumer but also other people associated with them. ⁽¹⁾ They represent more than 1/3rd of deaths due to alcohol. ⁽²⁾ Emergency physicians are in the unique position of seeing the full spectrum of the acute health problems associated with alcohol use as alcoholic-injured patients are less likely to use healthcare services other than emergency departments (ED). ⁽³⁾ The anecdotal reports from ED staff have always indicated that many patients had alcohol problems, but only during the 1990s, systematic screening studies have validated these reports, ^(4,5) thus making EDs an ideal location to both detect hazardous drinkers and to offer help to reduce their consumption. ⁽⁶⁾ This study is aimed to identify the pattern of injuries in alcoholics presenting in ED and note the pattern of drinking associated with injuries.

Material and methods

The present study was undertaken in the Emergency department of tertiary care hospital, Kolkata prospectively over a period of two years (Dec 2015-Dec 2017). **Inclusion criteria** were patients > 18 years of age, presenting within 6 hours of the injury and providing informed consent from patient or relatives. **Exclusion criteria** were brought dead patients, suspected cases having co-ingestions with other substances of abuse. History was obtained with special regard to the following points- mechanism of injury, exact time of the incident, amount consumed, presence of intoxication, typical drinking habits. A standardized form developed by world health organization June 2001 draft ⁽⁷⁾ was used for this purpose. Physical examination included precise anatomical description and nature of injuries. The patients were assessed for alcohol consumption by 3 methods- (i) Clinical assessment for presence of alcohol intoxication (ii) Self reporting of alcoholism assessed by questionnaire (iii) Breath alcohol analysis (BrAC) performed as soon as possible using Alcosensor III breath alcohol analyzer. Information was collected by the researcher himself with the help of duty nurses. Utmost care was taken not to hamper the emergency services or resuscitation of the patients during the course of interview. Duty hours are generally assigned shift wise randomly to every resident doctor, which ensured to negate the bias based on the

time of presentation of the patient.

Results

Total 610 injured patients were assessed of whom, only 512 completed the study protocol. Of these 512 patients, 331 (64.6%) were males and 181 (35.4%) were females. Again 312 (60.9%) were positive for alcohol intake while 200 (39.1%) found negative for alcohol. Among the alcoholics, 223 (71.5%) people were males, 89 (28.5%) were females. Among the non-alcoholic 108 (54%) were males, 92 (46%) were females. The difference between gender and alcoholic was statistically significant. (P<0.001) The mean age was 36.09 ± 14.1 in the study population (Table 1)

Table 1: Descriptive analysis of gender in study population

Age Group (yrs)	Alcoholics (n=312)		Non alcoholic(n=200)		Total
	Male	Female	Male	Female	
18-29	96	28	42	32	198
30-39	47	25	32	32	136
40-49	40	16	16	12	84
50-59	20	14	06	08	48
>= 60	20	06	12	08	46
Total	223	89	108	92	512

Among the 312 alcoholics, 80 (25.6%) cases were received in ED during day time while 232 (74.4%) during night. On the other hand, non-alcoholic 76 (38%) of non-alcoholics were received during the day. The association of time of receipt in ED and alcohol consumption was statistically significant. (p=0.003)

Table 2: Breath alcohol content range value in study population (N=512)

Parameter	Mean ±STD	Median	Min	Max	95% C.I. for EXP(B)	
					Lower	Upper
Breath alcohol content range value in mg/dl	26.58 ± 27.45	21.00	0.00	99.00	24.19	28.96

The breath alcohol content in the study population was found to be a minimum of 0 to a maximum of 99 mg/dl with a mean of 26.58 ± 27.45 mg/dl.

Table 3: Various detection methods of consumption in alcoholic study population (N=312)

Method of detection	Frequency	%
Self report	176	56.4
BrAC	42	30.1
Both	94	13.4

270 (86.5 %) of cases reported alcoholism on self reporting while only 136 (43.6%) were positive on BrAC.

Table 4: Comparison of different types of injury in the study population (N=512)

Injury	Present	Alcoholic (N=312)	Non-alcoholic (N=200)	Chi square	P-value
Fractures	Yes	50 (16%)	30 (15%)	0.09	0.755
	No	262 (84%)	170 (85%)		
Sprain	Yes	70 (22.4%)	86 (43%)	24.32	<0.001
	No	242 (77.6%)	114 (57%)		
Abrasions	Yes	124 (39.7%)	140 (70%)	44.67	<0.001
	No	188 (60.3%)	60 (30%)		
Lacerations	Yes	58 (18.6%)	20 (10%)	6.964	0.008
	No	254 (81.4%)	180 (90%)		
Head Injury	Yes	56 (17.9%)	14 (7%)	12.37	<0.001
	No	256 (82.1%)	186 (93%)		
Burns	Yes	23 (7.4%)	7 (3.5%)	3.312	0.069
	No	289 (92.6%)	193 (96.5%)		

During comparison of different type of injuries among the alcoholic and non-alcoholic subgroups of the study population statistical significant difference was found in association of alcoholism with injuries like sprains, abrasions and head injury in comparison to non-alcoholics. Fractures and burns did not demonstrate any significant difference in the two groups.

Table 5: Comparison of alcoholics with injury variety of study population (N=512)

Nature of Injury	Alcoholic		Chi square	P-value
	Alcoholic (N=312)	Non-alcoholic (N=200)		
Unintentional injury	266 (85.3%)	144 (72%)	16.32	<0.001
Intentional injury by others	22 (7.1%)	36 (18%)		
Self-inflicted injury	24 (7.7%)	36 (18%)		

Most common injury encountered in the alcoholics was unintentional injury like non-alcoholic population. Intentional injury by others and self inflicted injury was more common in non-alcoholics than alcoholics.

Discussion

Alcoholism is an important contributor to the use of emergency services.⁽⁸⁾ Other way round the ED population is also specially suited to assess the alcohol abuse and study the association of alcohol in causation of injury.⁽⁹⁾ In the present study 312(60.9 %) were found positive for alcohol intake. Similar findings have also been noted by Cherpital *et al*, 2018 in countries in Ireland and Korea.⁽¹⁰⁾ In the present study, there is a significant gender difference noticed among the alcoholic and non-alcoholic population. (p<0.001) Similar to our study other works have also found a preponderance of male population in injured alcoholics. This study also found most of the injured (38.7%) patients belonged to the age group of 18-29 years. Injuries make up the bulk of premature death (under 70 years of age) internationally, particularly affecting men under 30 years of age.^(11,12) In the present study, among the alcoholics 266(85.3%) people had unintentional injury while same was lower among the non-alcoholic i.e. 144 (72%). Injuries show an exponential dose response relationship with blood alcohol concentration (BAC).⁽¹³⁾ The epidemiological literatures show that even at low BACs, injury risk is increased compared with that of no alcohol consumption.⁽¹³⁾ The mean breath alcohol content in this

study population was 26.58 mg/dl. The acute effects of alcohol consumption on injury risk are also mediated by how regularly the individual drinks. People who drink less frequently are more likely to be injured or to injure others at a given BAC compared with regular drinkers, presumably because of less tolerance.⁽¹⁴⁾ Alcohol consumption is linked not only to unintentional but also to intentional injury. Both average volume of alcohol consumption and the level of drinking before the event have been shown to affect suicide risk.⁽¹⁵⁾ There also is a clear link between alcohol consumption and aggression, including but not limited to homicides.⁽¹⁶⁾ Several causal pathways have been identified that play a role in this link, including biological pathways acting via alcohol's effect on receptors for the brain signalling molecules (i.e., neurotransmitters) serotonin and aminobutyric acid or via alcohol's effects on cognitive functioning.⁽¹⁶⁾ In the present study the alcoholic group shows about 22 (7.1%) people had Intentional injury by others, 24 (7.7%) people had self-inflicted injuries. There is a statistically significant difference between alcoholics and non alcoholics in respect to intentional injury in our study. (p<0.001). Cultural factors that are related to both differences in drinking patterns and beliefs and expectations about the effects of alcohol also influence the relationship between drinking and aggression.^(17,18)

Of the total patients found positive for alcohol (312) by any means, 176 (56.4%) were positive on self reporting, 42 (13.4%) by BrAC while 94 (30.1%) on both BrAC and self report. The prevalence of positive self reports is greater than positive BACs in other similar studies.^(19,20) In many previous studies self report has been shown to be a more valid indicator of acute alcohol consumption.⁽²¹⁾ At low level of consumption self report corresponds well with BAC,⁽²⁰⁾ so it has been proposed to be a preferable measure of alcohol detection in ED studies. The present study restricted the patient sample to those arriving at the ED within 6 hrs of injury event, to control the time lag between the last drink and arrival in ED, since large difference in BAC and self report estimates have been noted when time of arrival in ED is not considered.⁽²²⁾ It metabolized at the rate of 0.015% of blood alcohol concentration (BAC) per hour. A person with a BAC of 0.08% will have no measurable alcohol in the bloodstream within 5½ h of the last drink, rendering breath testing useless. Thus, alcohol intake should be estimated by using both BAC and self report of drinking. Clinical assessment of alcoholism when taken into consideration showed 68 cases (21.8%) cases as intoxicated. A previous study has established that identification of alcohol intoxication was feasible only with a sensitivity of 75.4%, specificity 90.4%, accuracy of 85%.⁽²³⁾ Although nurses' assessment of alcoholism is convenient and clinically useful in detecting acute alcohol intoxication it may underestimate the rate of alcohol related injuries.

Abrasions, sprains and head injuries along with multi organ involvement were found to be more commonly involved in the alcoholic injured patients. There was a significant difference in injury severity between alcohol related and non alcohol related injuries. Head and organ injury were more common in alcoholics than non alcoholics. (p<0.001) Similar findings have been noted by other studies.⁽²⁴⁾ Observer bias cannot be ruled while dealing with patients of injury and the technical limitations of the use of breath alcohol analyser have to be considered as a drawback of the study.

Conclusion

We can conclude in the present study that a significant number (60.9%) of patients presenting with injuries to the Emergency Department were found positive for the presence of alcohol. So screening for alcohol can be used as a routine measure in all patients presenting with injury. Self reporting and Breath alcohol analysis should be encouraged as the objective methods of screening supplementing the clinical assessment. However, as the prevalent law of the land does not encourage people to disclose addiction/ intoxication in fear of both police cases and or non-reimbursement of cost of treatment by Insurance companies. So the absence of voluntary disclosure of alcohol consumption on part of the injured patients leading to decreased documentation only acts like hiding the dust under the carpet and closing the eyes to impending problems, where by the alcoholics cannot be officially recognized and offered much needed support. We would suggest more number of similar studies in different centres throughout India so that necessary data can be compiled before giving recommendations to the law makers for future improvement.

Ethical statement

This research proposal was submitted to the Research Ethics

Committee of Peerless Hospital & B. K. Research Centre, Kolkata for scrutiny and undertaken after approval granted.

REFERENCES

1. Fraade-Blanar L, Concha-Eastman A, Baker T. Injury in the Americas: the relative burden and challenge. *Rev Panam Salud Publica* 2007; 22(4):254-9.
2. World Health Organization (WHO). Alcohol and injuries: emergency departments studies in an international perspective. Geneva: WHO; 2009
3. Cherpitel CJ. Emergency room and primary care services utilization and associated alcohol and drug use in the United States general population. *Alcohol* 1999; 34:581-9.
4. National Institute on Alcohol Abuse and Alcoholism. The economic costs of alcohol abuse. In: Special Report to the U.S. Congress on Alcohol and Health; Highlights from Current Research. Washington (DC): U.S. Department of Health and Human Services 2000; 364-71. NIH Publication No. 00-1583.
5. Committee for the Study of Treatment and Rehabilitation Services for Alcoholism and Alcohol Abuse, Institute of Medicine, Division of Mental Health and Behavioral Medicine, National Academy of Sciences. Broadening the Base of Treatment for Alcohol Problems. Washington (DC): National Academy Press; 1990.
6. Drummond D C, Phillips T, Coulton S, Barnaby B, Keating S, Sabri R et al. National prevalence survey of alcohol-related attendances at accident and emergency departments in England. *Alcoholism: Clinical and Experimental Research* 2005; 29:36A-36A
7. Collaborative study on alcohol and injuries registration, screening, assessment and questionnaire forms .World health organisation. June 2001 Draft: Version 1g. https://www.who.int/substance_abuse/activities/en/InjuriesInstrumentEnglish.pdf
8. Huang JA, Tsai WC, Chen YC, et al. Factors associated with frequent use of emergency services in a medical center. *J Formos Med Assoc* 2003; 102: 222-8.
9. Mancino M, Cunningham MR, Davidson P, et al. Identification of the motor vehicle accident victim who abuses alcohol: an opportunity to reduce trauma. *J Stud Alcohol* 1996;57:652-8.
10. Cherpitel C, Ye Y, Poznyak V. Single episode of alcohol use resulting in injury: a cross-sectional study in 21 countries. *Bull world health Organ* 2018; 96(5): 335-42.
11. Rehm J, Monteiro M. Alcohol consumption and burden of disease in the Americas: implications for alcohol policy. *Rev Panam Salud Publica* 2005; 18(4-5):241-8.
12. Rehm J, Sulkowska U, Manczuk M, et al. Alcohol accounts for a high proportion of premature mortality in central and eastern Europe. *Int J Epidemiol* 2007; 36(2):458-67.
13. Taylor B, Irving HM, Kanteres F, Room R, Borges G, Cherpitel C, et al. The more you drink, the harder you fall: A systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug and Alcohol Dependence* 2010; 110(1-2):108-16.
14. Gmel G, Kuntsche E, Rehm J. Risky single occasion drinking: Bingeing is not bingeing. *Addiction*. Published online: DOI: 10.1111/j.1360-0443.2010.03167.x, Oct. 18, 2010. -
15. Borges G, Loera CR. Alcohol and drug use in suicidal behaviour. *Current Opinion in Psychiatry* 2010; 23(3):195-204.
16. Rehm J, Room R, Graham K, Monteiro M, Gmel G, Sempos CT. The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: An overview. *Addiction* 2003(b); 98(9):1209-28.
17. Leonard KE. Alcohol and intimate partner violence: When can we say that heavy drinking is a contributing cause of violence? *Addiction* 2005; 100(4): 422-5.
18. Room R, Rossow I. The share of violence attributable to drinking. *Journal of Substance Use* 2001; 6(4):218-28.
19. Kelly DF, Lee SM, Pinarong PA, et al. Paradoxical effects of acute ethanolism in experimental brain injury. *J Neurosurg* 1997;86: 876-82.
20. Cherpitel CJ, Pares A, Rodes J, Rosovsky H. Validity of self-reported alcohol consumption in the emergency room: data from the United States, Mexico and Spain. *Journal of Studies on Alcohol*. 1992; 53: 203-7.
21. Cherpitel CJ. Alcohol and injuries: a review of international emergency room studies. *Addiction*. 1993; 88:923-37.
22. World Health Organization. Alcohol and injuries: emergency department studies in an international perspective. Geneva, Switzerland: 2010.
23. Li YM. Feasibility of identification of alcohol intoxication by nurses in emergency departments. *Kaohsiung J Med Sci* 2003;19: 391-7.
24. Humphrey G, Casswell S, Han D. Alcohol and injury among attendees at a New Zealand emergency department. *NZMJ* 2003; 116:1168.