Profile of Alcoholic Liver Disease in Population of Jharkhand: An Insight into the Realm of Alcoholism from Profligacy to Burden

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ABSTRACT

Introduction: Alcoholic liver disease (ALD) is a major cause of mortality and morbidity in our country. Though the alcoholics are predisposed to develop alcoholic liver disease yet only 10-20% of them develop alcoholic hepatitis. Several studies have incriminated the type, amount and duration of alcohol intake, ethnicity and gender as key determinants of this dreadful disease. This study was conducted to elucidate the overt and obscure risk factors for alcoholic liver disease.

Material and methods: 106 patients of ALD admitted to General Medicine department of our hospital were evaluated clinically as well as using various biochemical and prognostic markers (Discriminant factor, Model of end stage liver disease and Child Pugh Score) and results correlated with the profile of their alcohol intake and socio demographic stratification.

Results: The mean age of the study group was 46.93± 8.83 years. Country liquor was the most commonly consumed alcoholic beverage amongst the males (34.93%) while 95% of the females, consumed Hadiya, (traditional rice beer) explicitly. ALD developed earlier in those consuming country liquor and hadiya together (6.16± 1.49). The three prognostic scores showed a significant relationship between type of alcohol consumed and development of ALD.

Keywords: Alcoholic Liver Disease, Country Liquor, Hadiya, Jharkhand, Alcoholism.

INTRODUCTION

Chronic and excessive alcohol intake has a hazardous impact on human health and society. Alcohol is the most common substance abused worldwide, yet the pattern of drinking along with the type and amount of alcohol varies considerably with respect to a person's socioeconomic status, cultural and regional background. South Asian race and female sex are more prone to develop liver disease with lesser alcohol consumption.[1-3] Occidental literature and data may not necessarily quantify and justify the Indian scenario. In India, vast majority of people consume country liquor, the alcohol content of which along with other hepatotoxins contained in it, has no fixed standard and varies significantly depending on the method of brewing.

In the state of Jharkhand locally fermented wine mahua and rice beer "Hadiya" is fairly popular among the locals and is consumed by majority of tribal population. The name hadiya is used probably because of the pot in which rice is fermented called "handi" in local language. Social drinking of hadiya is acceptable and is not considered a taboo even in females. In Eastern Indian states of Jharkhand, Orissa and West Bengal, the indigenous tribes prepare hadiya using rice grain (Karahani and Gora rice) as substrate and fermentation is done using a herbal root mixture called "Ranu" an amalgamation of 21 herbs mixed with polished rice and made in pebble shaped and dried for 4 days. Alcohol content is found to be around 18-20% in this rice beer. Mahua is made by fermentation of flowers of Mahua tree (*Madhuca longifolia*), an Indian tropical tree.

Alcoholic liver disease consists of three major lesions, with the progressive injury rarely existing in a pure form (1) Alcoholic fatty liver, (2) Alcoholic Hepatitis, and (3) Cirrhosis. Fatty liver is present in 90% of daily and binge drinkers. A much smaller percentage of heavy drinkers progress to alcoholic hepatitis considered the precursor of cirrhosis.[4]

Although alcohol is considered a direct hepatotoxin, only 10-20% progress to alcoholic hepatitis. The factors predisposing to this development may include amount, type and duration of alcohol consumed along with certain less obvious facts like a person genetic predisposition, race sex and other co morbid conditions. South Asian Population is more prone to develop ALD due to genetic polymorphism of the genes responsible for alcohol metabolism[5]

Clinical feature of cirrhosis include Jaundice, spider angioma, palmer erythema, Dupuytren's contracture hypogonadism, muscle wasting, splenomegaly, Ascites and Hepatic Encephalopathy. The extent of protein energy malnutrition may also play a significant role in determining the outcome of patients with ALD.[6,7]

This study was conducted to explore the profile of Alcoholic liver disease in population of Jharkhand and neighbouring states wherein it has a substantial impact on mortality and morbidity.

MATERIAL AND METHODS

This was a descriptive study conducted in 106 randomly selected patients of alcoholic liver disease admitted in the Department of General Medicine, Rajendra Institute of Medical Science, Ranchi, Jharkhand, India. The study was carried out for a period of one year from January 2016 to January 2017 after taking their informed written consent by the patients.

Inclusion Criteria: Adult patients of ages between 30-70 years with alcoholic liver disease were included in this study. AUDIT-C score >4 was used to determine history of alcohol abuse.

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Exclusion Criteria: Immunocompromised patients, viral hepatitis B and C, age less than 30 years and more than 70 years and patients with other co-morbid illness were excluded from this study.

The approval of institutional ethics committee was taken prior to the commencement of this study.

The detailed history was taken as per the proforma and a thorough clinical examination was done supported by the necessary biochemical tests like liver function test, complete blood count, renal function test, prothrombin time and INR. An ultrasound of whole abdomen was done to visualize fatty liver, along with texture, morphology and homogenecity of liver.

The type of alcohol consumed was noted and detailed history of the drinking habit of the patient was taken. Based on the clinical and laboratory data various prognostic markers of chronic liver disease like Mddrey's Discriminant factor, MELD score and Child Pugh Score were calculated and assessed.

STATISTICAL ANALYSIS

The data was tabulated and evaluated using Microsoft Excel version 2013. MedCalc statistical package was used for data analysis. Chi square test was used for categorical variables and one way ANOVA test for quantitative data.

RESULTS

This study comprised of 106 alcoholic patients from Jharkhand and neighboring states with mean age of 46.9±8.83 years. 78.3% of these patients were males and 21.69% females. 69% of the patients belonged to tribal community and 37% belonged to other population groups. Evaluating the prevalence of various types of alcoholic beverages in this region we found that 33.9% patients have been consuming only hadiya, 27.35% patients were consuming Illicit Country Liquor, 22.64% patients have been consuming both hadiya and country liquors and 16.03% patients were consuming only branded licit liquors (Figure 1). Country liquors were more popular among males while 95% of the female patients consumed hadiya explicitly.

People drinking Hadiya and country liquors consumed more amount (>4 drinks/day) as compared to whisky and other branded liquors (1-3 drinks/day). Amongst the tribal population hadiya was the most prevalent liquor (46.37%), 27.5% tribal patients consumed both hadiya and country liquors in variable proportions. This trend was quite different when compared to non tribal population, majority of which consumed country liquors (40.5%), followed by branded licit liquors (35%).

The most complications observed among the patients were ascites (53.7%), followed by hepatic encephalopathy (20.7%), upper gastrointestinal bleed (18.86%), sub-acute bacterial peritonitis (3.7%) and hepatorenal syndrome (2.8%) (Figure 2). Biochemical investigations showed Leukocytosis in 27% patients and anaemia in 68% patients. Hyperbilirubinemia was seen in 79% patients with mean total bilirubin level 6.2±2.5 mg/dl and 70% patients showed elevated liver enzymes with mean AST/ALT ratio of 2.2±1.3. Mean albumin level was 2.11±0.9 g/dl and mean INR was 2.7±0.7. Renal function was deranged in 2.8% patients.

The average duration of development of alcoholic liver disease with respect to the type of alcoholic liquor consumed was analysed in this study wherein we found that those consuming country liquor along with hadiya developed ALD the earliest (6.16±1.49 years), those consuming only country liquor developed ALD in (7.89±1.519 years) compared to the ones consuming only hadiya (14.13±5.75 years) and branded drinks like whisky (17.17±7.92 years) demonstrating thereby that the locally brewed country liquors are the worst.

Prognostic outcome measures for ALD like Maddrey's Discriminant factor, MELD score and Child Pugh Score were calculated and correlated with the type and amount of alcohol consumed wherein we found a significant correlation between the type of alcohol consumed and development of ALD (Table 1,2).

DISCUSSION

Alcoholic liver disease is a disease of antiquity, a well known adversary to human health and well being. Alcohol is associated with high mortality and morbidity, 3.7% of the global deaths and 4.4% of the global DALYs lost in the year 2002 could be attributed to this exposure.[8] The problem of alcoholism is multifaceted. An amalgamation of social, cultural, psychological and nutritional issues is linked to the development of this dreadful disease.

In our study we inferred that ALD is prevalent in younger and middle aged individuals mean age being 46.5 ±12.02. This result emphasizes the fact that younger and middle aged individuals are under the influence of alcoholism which is alarming, taking into consideration that this is the most productive age group of society.

Alcoholism and subsequent alcoholic liver disease is quite prevalent in the tribal people of Jharkhand. Many don't exactly consider it to be an alcohol or an agent affecting their

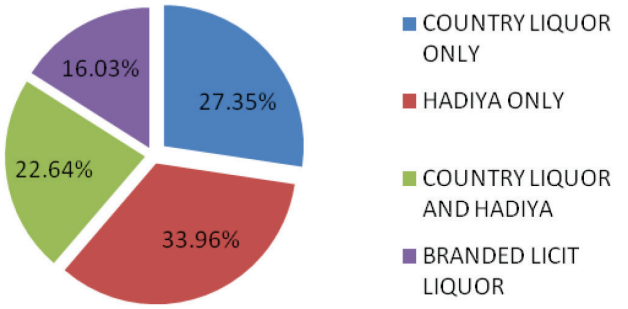

Figure-1: Different types of alcoholic liquor consumed by study population

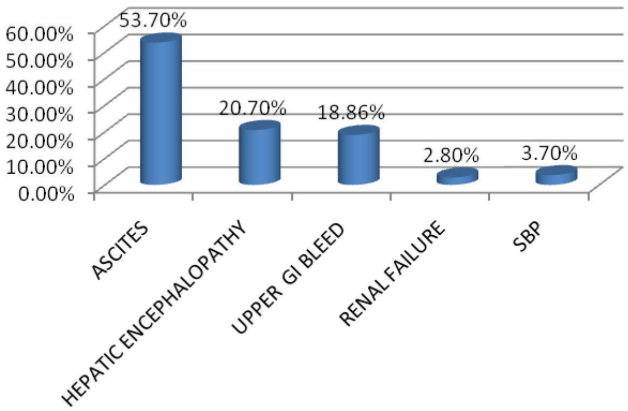

Figure-2: Complications of ALD

	Country liquor (n=29)	Hadiya (n=36)	Country liquor and hadiya (n=24)	Branded licit liquors (n=17)	p value
Discriminant factor	55.99±2.84	55.09±5.2	64.003±3.82	57.24±2	0.00
MELD score	19.45±1.9	17.016±1.5	20.95±1.52	17.85±1.41	0.01
Child Pugh score	11.10±1.77	9±1.37	12.45±1.35	9.76±2.04	0.01

Table-1: Correlation of ALD prognostic markers with type of alcoholic beverage consumed

	Light drinking (n=26)	Moderate drinking (n=43)	Heavy drinking (n=37)	p value
Discriminant factor	57.57±4.68	57.64±4.56	60.208±5.56	0.04
MELD score	18.66±1.7	18.97±1.36	18.45±1.48	0.20
Child Pugh score	10.46±1.1	10.41±1.5	11.59±1.62	0.23

Table-2: Correlation of ALD prognostic marker with the amount of alcohol intake per day

	Country liquor (n=29)	Hadiya (n=36)	Country liquor and hadiya (n=24)	Branded licit liquors (n=17)	p value
Duration (in years) for development of ALD	7.89 ± 1.519	14.13 ± 5.75	6.16 ± 1.49	17.17 ± 7.92	0.00

Table-3: Correlation between duration of alcohol intake and development of ALD

health adversely. In this study 69.09% patients were from tribal communities where hadiya (Rice beer) is consumed ceremoniously. Some researchers state that, taken in moderate amount hadiya is expected to have medicinal and nutritive value.[9] Nonetheless in our study we found that hadiya consumed either in moderate or large amount had detrimental effect on the liver.

In India vast majority of people consume illicit country liquor. The exact percentage of alcohol depends on the method of brewing which is often below standard and unsupervised. Since it is affordable to the lower income groups it is widely prevalent and as such we found that it was the most commonly used alcoholic beverage in our study group.

Our study indicated that those who took country liquor together with hadiya developed ALD earlier (6.16±1.49 years), followed by those who took only country liquor (7.89±1.5) (Table 3). These patients had bad prognostic outcomes as denoted by the comparison of Discriminant factor, MELD Score and Child Pugh scores (Table 1), p value being 0.00, F value in one way ANOVA test being 27.6. These results were consistent with the study done by Narawane et al in a study of 328 patients of ALD on a Mumbai public hospital where the found that cirrhosis was more common in people consuming illicitly brewed country liquor.[10] Nand et al in their study highlighted similar results.[11]

In this study we divided the patients into three groups on basis of amount of alcohol consumed per day i.e. Light drinking (1-2 drinks/day), Moderate drinking (2-4 drinks/day for men and <3 drinks/day for women) and Heavy drinking (>4 drinks per day for men and >3 drinks/day for women) as stated by the National Institute of Alcohol Abuse and Alcoholism.

Comparing Discriminant factor in all the three groups showed a significant correlation between amount of alcohol intake and development of ALD (p=0.04), however similar results were not found considering MELD Score and Child Pugh Score, p value being 0.2 and 0.23 respectively (Table 2). Becker et al in their prospective cohort study in Copenhagen observed a dose dependent increase in risk of ALD.[12]

CONCLUSION

Our study highlights that there exists a definite correlation between development of ALD with the type and duration and amount of alcohol consumed. Illicitly brewed country liquors are associated with an early development of ALD and have grave prognosis. The use of hadiya couldn't be vindicated of producing chronic liver disease and hence should be lessened if not avoided. Alcohol as a substance abuse has a collateral damage destroying lives and families, hence necessary steps to curtail its use is required by the legislation.

REFERENCES

1. Sato N, Lindros KO, Baraona E, Ikejima K, Mezey E, Jarvelainen HA, et al. Sex difference in alcohol-related organ injury. Alcohol Clin Exp Res. 2001;25:40S– 45S.
2. Furube M, Sugimoto M, Asakura I, Mizukami H, Akita H, Hatori T, et al. Sex difference in alcoholic liver disease: with special reference to the severity of alcoholic hepatitis. Arukoru Kenkyuto Yakubutsu Ison. 1989;24:135-43.
3. Douds AC, Cox MA, Iqbal TH, Cooper BT. Ethnic differences in cirrhosis of the liver in a British city: Alcoholic cirrhosis in South Asian men. Alcoholism. 2003; 38:148-50.
4. Mark E Mailliard, Michael F. Sorrell. Alcoholic liver disease. In: Harrison's Principles of Internal medicine. Longo, Fauci, Kasper, Hauser, Jameson, Loscalzo (eds.). McGraw Hill Publication. 19th edition. Vol. 2, Chapter 363, p.2052-2054
5. Shuppan D, Afdhal NH. Liver Cirrhosis. Lancet. 2008;371:838–851.
6. Mendenhall C, Roselle GA, Gartside P, Moritz T. Relationship of protein calorie malnutrition to alcoholic liver disease: a reexamination of data from two Veterans Administration Cooperative Studies. Alcohol Clin Exp Res. 1995;19:635-41.
7. Leevy CM, Moroianu SA. Nutritional aspects of alcoholic liver disease. Clin Liver Dis. 2005;9:67-86.
8. World health Organization. Evidence based strategies and interventions to reduce alcohol related harm. Sixteenth world health assembly, Provisional agenda item 12.7. WHO. 2007.
9. Deep Jyoyti Bhuyan et al. Biochemical and Nutritional analysis of rice beer of North East India. Indian Journal of Traditional knowledge. 2014;13:142-148.
10. Narawane NM, Bhatia S, Abraham P, Sanghani S, Sawant SS. Consumption of 'country liquor' and its relation to alcoholic liver disease in Mumbai. J Assoc Phys Ind. 1998;

46:510-13.
11. Nitya Nand, Praveen Malhotra, Dipesh Kumar Dhoot. Clinical profile of Alcoholic liver disease in a Tertiary care hospital and its correlation with type, amount and duration of Alcohol Consumption. Journal of The Association of Physicians of India. Vol. 63. June 2015.
12. Becker U, Deis A, Sorensen TI, Gronbaek M, Borch-Johnsen K, Müller CF, et al. Prediction of Risk of Liver Disease by Alcohol intake, Sex, and Age: A prospective population study. Hepatology. 1996;23:1025-9.

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