Nigerian Journal of Clinical Practice
Dec. 2010 Vol. 13(4): 360-364

THE CONTRIBUTION OF ALCOHOL TO CHRONIC LIVER DISEASE IN PATIENTS FROM SOUTH-WEST NIGERIA

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ABSTRACT

Objective: This study aimed at determining the level and type of alcohol consumed by patients diagnosed with chronic liver disease (CLD) and, hence, the extent to which alcohol may have contributed to the development of the condition.

Study Design: Patients with diagnosis of CLD were consecutively recruited and a structured questionnaire was administered on each of them. Diagnosis of CLD was made based on liver histology and/or typical clinical and laboratory features. Alcohol consumption was considered significant if a patient took >50g/day for > 10 years.

Results: A total of 145 patients were studied consisting of 102 males and 43 females. Their ages ranged from 20- 80 years with a mean of 46.8 ± 15.7 years. Fifty-one (35.2%) patients, all males, drank significant alcohol while consumption was not significant in 43 (29.6%) patients. Alcohol was not consumed at all by 51 (35.2%) patients made up of 18 males (35.3%) and 33 females (64.7%). Beer was the commonest form of alcohol consumed (70.2%) followed by palm wine (50%) and locally-brewed gin (20.2%).
The diagnoses made were liver cirrhosis [LC] (60, 41.38%), chronic hepatitis [CH] (54, 37.20%), hepatocellular carcinoma [HCC] (23, 15.86%), alcoholic liver disease [ALD] (6, 4.14%) and non-alcoholic fatty liver disease [NAFLD] (2, 1.38%). The liver disease spectrum did not differ between the patients who drank significant alcohol and those who did not. However, the proportion of LC/HCC cases increased relative to CH with increasing age and consumption of alcohol.

Conclusions: The proportion of CLD directly attributable to alcohol (i.e. ALD) is low among the patients studied. However, the burden of LC and HCC is directly related to age and the amount of alcohol consumed and the determinants of alcohol abuse are gender and affluence.

Key Words: Alcohol, chronic liver disease, viral hepatitis

INTRODUCTION

It has been estimated that 4% of the burden of disease and 3.2% of all deaths globally can be attributed to alcohol[1]. The clinical spectrum of alcoholic liver disease (ALD) includes fatty liver, alcoholic hepatitis and cirrhosis. Alcohol is the leading cause of liver cirrhosis in the developed countries. In the United States of America, alcohol is implicated in more than 50% of liver-related deaths and ALD gulps about $3 billion annually[2]. It has, however, been observed that whereas alcohol consumption is declining in developed countries the opposite is the case in developing countries where viral hepatitis is already prevalent[3]. Also, it is known that alcohol and viral hepatitis B and/or C have synergistic effect on the progression of liver disease to cirrhosis and hepatocellular carcinoma (HCC)[4-6]. Only few studies from Nigeria, a country located in the region endemic for viral hepatitis, have attempted to relate chronic liver disease (CLD) to alcohol consumption[7,8]. This study therefore sought to know the contribution, if any, of alcohol to the CLD seen in the South-west of Nigeria and the proportion of them directly attributable to alcohol.

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MATERIALS AND METHODS

Consecutive patients on whom the impression of CLD was made at the Medical Out- Patient (MOP) clinics and Medical Wards of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Nigeria, were interviewed and examined with a structured questionnaire. The study covered the period of 1987 to 2002. The diagnosis of CLD was made by liver histology (n= 101, 69.6%), typical clinical features + ultrasound scan (USS) (n= 31, 21.4%), USS + oesophagoscopy/barium swallow (n= 8, 5.5%) and clinical features + coagulation tests + ascitic fluid & serum chemistry studies (n= 5, 3.5%).
The amount of alcohol consumed was calculated

based on the average concentration (w/v) of alcohol in the common brands sold in the Nigerian market (i.e. 2% for palm wine, 5% for beer/stout, 15% for wine and 40% for gin/whisky). Alcohol consumption was considered significant if a patient took > 50g alcohol per day for at least 10 years. The diagnosis of alcoholic liver disease (ALD) was made if, in addition to significant alcohol consumption, some or all of the following histopathological features were present on liver biopsy: centrilobular/periportal infiltration by polymorphs, macrovesicular steatosis, ballooning degeneration, hepatocytes containing Mallory's hyaline (alcoholic hepatitis), finely regular nodules, portal fibrosis with piecemeal necrosis and porto-portal fibrous tissue linkages (alcoholic cirrhosis). Patients who had the following diagnoses on liver histopathology were excluded from the study: hyper-reactive malaria splenomegaly (HRMS), metastatic liver carcinoma, myelo-proliferative diseases, extra-hepatic bile duct obstruction, non-specific reactive hepatitis and chronic passive congestion of the liver. These conditions were not considered as strictly chronic liver diseases. The results were analyzed using simple descriptive statistics and the independent *t* test. P value < 0.05 was taken as significant.

RESULTS

A total of 145 patients were studied consisting of 102 males and 43 females (M: F ratio = 5:2). Their ages ranged from 20-80 years with a mean of 46.8 years (SD±15.7) (Table 1). The mean age (in years) by sex was 48.7 (SD±16.0) for males and 42.3 (SD±14.2) for females. Fifty-one patients (35.2%), all males, consumed significant alcohol while the consumption was not significant in 43 patients (29.6%). Alcohol was never consumed by 51 patients (35.2%) made up of 18 males (35.3%) and 33 females (64.7%) (Table 2). Cocoa farmers (35.3%) and Civil Servants (11.8%) formed the bulk of those who abused alcohol. On the other hand, those who never drank alcohol were mainly made up of petty traders (31.4%) and students (17.6%).

Beer was the commonest alcoholic brand consumed (70.2%) followed by palm wine (50%), locally brewed gin (20.2%), whisky/brandy/schnapps (14.9%), stout (8.5%) and wine (1.0%) (Table 3).

The specific diagnoses made were liver cirrhosis (60, 41.38%), chronic hepatitis (54, 37.20%), hepatocellular carcinoma (23, 15.86%), alcoholic liver disease (6, 4.14%) and non-alcoholic fatty liver disease (2, 1.38%).

Of all the 145 patients studied, 65 (44.8%) were not tested for markers of hepatitis B virus (HBV) infection and most of these (84.4%) were those seen early in the study (1987-1990) when routine testing for viral hepatitis markers had not been established in our hospital. Of the 80 remaining patients, 49 (61.25%) were sero-positive for HB surface antigen (HBsAg) while the liver tissue was positive for the antigen in 6 (7.5%) others. HBsAg was negative in 25 (31.25%) patients. Hepatitis C virus (HCV) antibodies were positive in only 1 (6.25%) patient out of 16 tested.

The ALD consisted of 3 each of cirrhosis and hepatitis (Table 4). The ages of the patients with ALD ranged from 45 to 70 years with a mean of 58.2 years and they were all males. Only one of them was tested for HBsAg and the result was negative. Chronic hepatitis (CH) was the predominant lesion (52.9%) among those who never drank alcohol while liver cirrhosis (LC) predominated among those patients that drank alcohol, whether significantly or not (42 out of 94, 44.6%). Also, the proportion of CH to LC/HCC increased from 1:1 to 1:3 as the level of alcohol consumption and the age (P < 0.05) increased (Tables 5 & 6).

Table 1: **Age & Sex Distribution of *CLD Patients.**

Age Group	Sex		Total
	Male	Female	
20 – 29	18	9	27
30 – 39	12	8	20
40 – 49	16	9	25
50 – 59	23	12	35
60 – 69	18	2	20
70 – 79	14	3	17
> 80	1	-	1
Grand Total	**102**	**43**	**145**

*CLD= Chronic Liver Disease

Table 2: **Alcohol Drinking Status of CLD Patients.**

	Sex		
Alcohol Drinking Status	**Male (%)**	**Female (%)**	**Total (%)**
Significant alcohol	51 (35.2)	-	51 (35.2)
Not significant alcohol	33 (22.7)	10 (6.9)	43 (29.6)
Sub-Total	84 (57.9)	10 (6.9)	94 (64.8)
No history of alcohol	18 (12.4)	33 (22.8)	51 (35.2)
Grand Total	**102 (70.3)**	**43 (29.7)**	**145 (100)**

Table 3: **The Brand of Alcohol Consumed by CLD Patients (n=94).**

S/No.	Brand of Alcohol	No. of Patients (%)
1.	Beer	66 (70.2)
2.	Palm wine	47 (50)
3.	Local gin ("Ogogoro")	19 (20.2)
4.	Whisky/Brandy/Schnapps	14 (14.9)
5.	Stout	8 (8.5)
6.	Brand not stated	8 (8.5)
7.	Wine	1 (1.0)

Table 4: **The Spectrum of CLD Diagnosed.**

Diagnosis	No. of Patients (%)
Liver cirrhosis (LC)	60 (41.40)
Chronic hepatitis (CH)	54 (37.20)
Hepatocellular carcinoma (HCC)	23 (15.86)
Alcoholic liver disease (ALD) (Cirrhosis 3, Hepatitis 3)	6 (4.14)
Non-alcoholic fatty liver disease (NAFLD)	2 (1.40)
Total	**145 (100)**

Key: CLD = Chronic Liver Disease, LC = Liver Cirrhosis, CH= Chronic Hepatitis, HCC= Hepatocellular Carcinoma, ALD = Alcoholic Liver Disease, NAFLD = Non-Alcoholic Fatty Liver Disease.

Table 5: **Lesion Type Based on Level of Alcohol Consumption.**

Alcohol Drinking Status	Lesion Type (%)					Total
	NAFLD	CH	ALD	LC	HCC	
Never drank	2 (3.9)	27 (52.9)	-	18 (35.3)	4 (7.8)	51
Not significant	-	14 (32.6)	-	21 (48.8)	8 (18.6)	43
Significant	-	13 (25.5)	6 (11.8)	21 (41.1)	11 (21.6)	51
Grand Total	**2**	**54**	**6**	**60**	**23**	**145**

Table 6: The Role of Alcohol and Age on CLD Progression.

S/No.	Alcohol Drinking Status	*Mean Age (Yrs.)	CH Vs. LC/HCC	Approx. Ratio
1.	Never drank (n=51)	39.06 (SD±14.24)	27 vs. 22	1:1
2.	Not significant (n=43)	46.56 (SD±16.07)	14 vs. 29	1:2
3.	Significant (n=51)	55.20 (SD±12.21)	13 vs. 32	1:3

*P < 0.05

DISCUSSION

Alcoholic liver disease (ALD) is typically diagnosed when, in addition to significant alcohol drinking, liver histology shows the characteristic features of centrilobular polymorphonuclear infiltrates, centrilobular hepatocyte swelling, ballooning degeneration, macrovesicular steatosis, Mallory bodies (hepatitis) and micronodular cirrhosis (cirrhosis)[2]. The actual amount of alcohol that will cause ALD has been the subject of some studies. Savolainen *et al*[9] found that there was an increased risk of ALD in males drinking an average of 60g of alcohol daily. Another study showed that daily consumption of >50g of alcohol was generally significant for both sexes, specifically 40-80g for males and 20-40g for females[10]. The prevalence of 4.14% obtained in this study for ALD is low compared with findings in more affluent societies[11].

Expectedly, most of our patients belonged to the low socio-economic group who could not afford the cost of steady consumption of the popular alcoholic brands in the market. The role of affluence on alcohol consumption was further highlighted as the big-time, cocoa plantation farmers and senior civil servants constituted the majority (47.1%) of alcohol abusers. However, the presence of local alcohol-brewing capability and the availability of a cheaper brand may also influence the level of consumption irrespective of the socio-economic status. This appears to be the case on the Jos Plateau of Nigeria where alcohol was found to be the cause of liver cirrhosis in 80% of the patients studied[8]. Thus, regional differences may exist in the prevalence of ALD in Nigeria.

It has been clearly shown that women are more vulnerable to alcoholic liver damage and also develop more severe disease than men[2, 12]. The postulated mechanisms for this gender difference in alcoholic liver damage include a relative deficiency of gastric alcoholic dehydrogenase in females, differences in alcohol bioavailability and other effects related to female sex hormones[2, 13]. No female patient in this study abused alcohol. This could be a manifestation of the social stigma attached to alcohol drinking by women in a conservative country like Nigeria. For the same reason, however, some of them who drink alcohol significantly may deny the habit.

Even though alcohol has been associated with liver damage, wine intake has been found to have some beneficial effects. The intake of wine reduces mortality from coronary heart disease and cancer[14]. Moderate wine drinkers also appear to be at lower risk of becoming heavy and excessive drinkers or developing liver cirrhosis[15, 16]. Only 1% of the patients in this study drank wine while the overwhelming majority drank beer or palmwine or 'ogogoro' (a locally brewed brand of high ethanol content). There may be a need, therefore, to promote a 'healthy' alcohol drinking habit among the Nigerian populace. Specifically, if people must drink then they should take only the beneficial brand (i.e. wine) in moderate quantities.

Whereas alcohol is the leading cause of chronic liver disease (CLD) in the developed countries, viral hepatitis is the main cause in most of the developing world. This is especially so in most parts of Asia and sub-Saharan Africa where infection with hepatitis B virus (HBV) is endemic. It was, therefore, not surprising that most cases of CLD seen in this study (94.4%) were not specifically of alcoholic origin. HBV-associated CLD was actually seen in 68.75% of the patients tested. This may account for the finding in this study of a similar spectrum of liver disease among those who consumed significant alcohol and those who did not. Alcohol, therefore, may not be a major aetiological agent for CLD including hepatocellular carcinoma (HCC) in Nigerians as shown by another study from the country[7]. It has, however, been shown that alcohol may aid the progression of liver disease to HCC. There was a statistically significant relationship between alcohol consumption and HCC in the USA[17]. Also, studies from Australia and the Far East showed that heavy alcohol drinking was associated with increased risk of ALD and HCC in patients with chronic HBV and HCV infections[12, 18, 19]. These findings have been corroborated by this study which demonstrated an appreciable increase in the proportion of liver cirrhosis/HCC cases relative to chronic hepatitis with increasing consumption of alcohol. This increase in LC/HCC: CH ratio was also found to be significantly related to increasing age. There is no doubt, therefore, that the development of liver cirrhosis and/or cancer depends on the duration of the hepatitis. However, the similar mean ages (55.20 vs. 58.2 years) for patients who drank significant alcohol and those with histopathological diagnosis of ALD showed that alcohol consumption was an independent determinant of progression of chronic hepatitis. It would therefore appear that both early diagnosis/treatment and abstinence from alcohol are important in order to reduce the risk of developing HCC in patients with chronic viral hepatitis.

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