

CLINICAL PROFILE OF PATIENTS WITH ALCOHOLIC LIVER DISEASE IN UPPER ASSAM OF NORTH EAST INDIA

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ABSTRACT

BACKGROUND

Alcohol is the most commonly abused drug worldwide causing liver injury with respect to dose, duration, type of alcohol consumption and drinking patterns and gender with diverse ethnicity and social customs. There is high prevalence of alcohol use in the society without much social taboo in the North Eastern States of India and also there is a high prevalence of different ethnic tribes with the custom of taking country made alcohol casually as a part of their tradition.

The aim of this study is to study the clinical profile of patients with alcoholic liver disease in upper Assam of north east India.

MATERIALS AND METHODS

The study was a hospital-based observational study in which patients of 18 years and older and diagnosed to have alcoholic liver disease were included. Cases excluded were patients of NASH, viral hepatitis, drug-induced hepatitis, haemochromatosis, alcoholic liver disease with diabetes and kidney disease. Informed written consent was taken from the patients or their attendants. Ethical clearance was taken from the Institutional Ethical Committee. A total of 138 cases were selected for the study. A detailed evaluation of clinical history, examination and investigations and the results were recorded in a predesigned proforma.

RESULTS

Out of 138 patients, 113 were males and 25 were females with male:female ratio of 4.5:1. Majority of cases (34.78%) were in the age group of (41-50) years. It was observed that 98 patients (71.01%) belonged to the lower socioeconomic status group. The average duration of alcohol intake was 18.39 ± 6.24 years for males and 16.76 ± 6.59 years for females. The overall average duration of alcohol intake was 18.09 ± 6.29 years. The majority of the patients (104 cases, 75.36%) took both foreign and country-made liquors. The most common clinical presentation was abdominal distension and swelling of feet (71 cases, 51.45%) followed by jaundice (68 cases, 49.28%) and anorexia (56 cases, 40.58%). The mean haemoglobin level was 8.6 ± 2.02 gm%. The mean AST was 155.61 ± 85.24 U/L and mean ALT was 81.65 ± 37.59 U/L. In ultrasonography of abdomen, cirrhosis of liver was seen in 60.14% cases, fatty liver in 20.29% cases and hepatomegaly with hepatitis in 19.57% cases. The most common findings in UGI endoscopy was oesophageal varices (56.19% cases). The average duration of alcohol intake in fatty liver, hepatitis and cirrhosis cases were 12.77 ± 3.70 , 14.56 ± 6.83 and 20.53 ± 6.08 years, respectively. The most common ECG findings were sinus tachycardia (31.88%). Atrial fibrillation was seen in 8.69% cases.

CONCLUSION

Alcoholic liver disease has a varied clinical and biochemical presentation ranging from the subtle features of fatty liver to obvious findings of decompensated cirrhosis. ALD was more common in people with lower socioeconomic status. A higher prevalence of ALD was also seen in the females.

KEYWORDS

Alcoholic Liver Disease, Fatty Liver, Hepatitis, Cirrhosis.

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BACKGROUND

Alcohol (ethanol) is the most commonly abused substance worldwide. Alcohol consumption causes 3.8% of total deaths and Alcoholic Liver Disease (ALD) represents 9.5% of alcohol-related disability adjusted life years worldwide.¹ The prevalence of alcohol consumption is higher in the developed countries like United States and Western Europe (per capita 10-15 L/year) compared to India (per capita 2-4 L/year). The National Family Health Survey (NHFS) 2007 reported that 30% of adult Indians have been consuming alcohol and of which 4% to 13% are daily users. There are reports of high

prevalence of ALD in India and about 50% of cases of cirrhosis maybe due to alcohol.²

India is the third largest market for alcoholic beverage in the world with an increasing trend of alcohol consumption along with a tendency toward unhealthy pattern of drinking.³ However, the data regarding the prevalence of ALD in India is scarce.⁴ There is more intake of poor quality country-made liquor, which is associated with more severe liver injury.⁵ In India, ALD occurs more commonly with consumption of illicit liquor despite its lower alcohol content with lower consumption levels than in the West due to the custom of taking country-made alcohol as a part of tradition. The prevalence of usage of alcohol among Indian women is reported to be much lower than their male counterparts, but it reaches upto 10% in the North Eastern States.⁶

Assam Medical College and Hospital, Dibrugarh, is a tertiary healthcare centre catering the bulk of the patients with different ethnic tribes from upper Assam and nearby States of Arunachal Pradesh and Nagaland. Alcoholic Liver Disease (ALD) is very common in this part of the country. But, very few studies have been done on this subject. This study has been undertaken with the aim and objective to study the clinical profile of patients with alcoholic liver disease.

MATERIALS AND METHODS

Procedure

Patients admitted in various units of the Department of Medicine, Assam Medical College and Hospital, Dibrugarh, from 1st July, 2012, to 30th June, 2013, were assessed and those provisionally diagnosed with ALD were taken up for the study. After considering the inclusion and exclusion criteria, a total of 138 cases were selected for the study. A detailed clinical history, physical examination and investigations were done in all the patients and results were recorded in predesigned proforma. The results were arranged in tables and charts and observations were made.

Diagnostic Criteria

The Diagnosis of Alcoholic Liver Disease is based on a Combination of Feature including⁷

- History of significant alcohol intake evaluated with the help of CAGE questionnaire.
- Clinical evidence of liver disease based on symptoms and signs.
- Supporting laboratory and radiological abnormalities.

Inclusion Criteria

- Age - 18 years and above
- All diagnosed cases of alcoholic liver disease admitted in the different wards of the Department of Medicine, Assam Medical College and Hospital, Dibrugarh.

Exclusion Criteria

- Liver diseases from other causes like NASH, viral hepatitis, drug-induced hepatitis and haemochromatosis.

- Alcoholic liver disease with diabetes mellitus and kidney disease.

Consent

Informed written consent was taken from the patients or their attendants.

Ethical Clearance

Ethical clearance was taken from the Institutional Ethical Committee, Assam Medical College and Hospital, Dibrugarh.

Ethnic Groups

The patients were divided into four linguistic ethnic groups found in India, i.e. Indo-European, Tibeto-Burman, Austro-Asiatic and Dravidian.⁸

Socioeconomic Group

The assessments of socioeconomic status of the patients were done as per the Kuppuswamy's Socioeconomic Status Scale 2012.⁹

RESULTS AND OBSERVATIONS

This is a hospital based observational study and the study group consisted of 138 cases of Alcoholic Liver Disease (ALD) admitted in the Department of Medicine, Assam Medical College and Hospital, Dibrugarh, during a period of one year from 1st July, 2012 to 30th June, 2013.

It was observed that out of the 138 patients, 113 (81.88%) patients were males and 25 (18.12%) were females with a male-to-female ratio of 4.5:1 and majority of cases (48 cases, 34.78%) were in the age group of (41-50) years. The mean age of the patients was 45.91 ± 10.34 years. The commonest ethnic linguistic group was Tibeto-Burman (61 cases, 24.64%) groups. Majority of the patients, 98 (71.01%) belonged to the lower socioeconomic status group, 34 patients (24.64%) belonged to middle socioeconomic status group and 6 patients (4.35%) belonged to upper socioeconomic status group.

A total of 120 patients (86.95%) were taking alcohol for more than 10 years and 18 cases (13.04%) for 10 years or less than 10 years. 40 cases (28.99%) were in the 11-15 years duration group and 44 cases (31.88 %) in 16-20 years duration group. 36 cases (26.09%) were taking alcohol for >20 years. The average duration of alcohol intake was 18.39 ± 6.24 years for males and 16.76 ± 6.59 years for females. The overall average duration of alcohol intake was 18.09 ± 6.29 years. A majority of the patients (104 cases, 75.36%) took both foreign and country-made liquors while 18 (13.04%) patients took foreign liquor only and 16 (11.59%) patients took only country-made liquor. As observed, 86 patients (62.32%) were taking alcohol throughout the weekdays and 52 (37.68%) were taking alcohol confined to 1-2 days a week.

The most common clinical presentation was abdominal distension and swelling of feet (71 cases, 51.45%) followed by jaundice (68 cases, 49.28%) and anorexia (56 cases, 40.58%). Forty-six patients (33.33%) complained of weight loss and fever was present in 35 (25.36%) cases. Twenty-

seven (19.57%) cases presented with altered sensorium and 41 cases (29.71%) presented with symptoms of upper GI bleeding.

Most common clinical finding was pallor (86 cases, 62.32%), which was followed by ascites (82 cases, 59.0%), pedal oedema (77 cases, 55.8%) and icterus (75 cases, 54.35%). Hepatomegaly was found in 61 (44.20%) cases and splenomegaly was found in 51 (36.96%) cases. Parotid swelling was seen in 29 (21.01%) cases and gynaecomastia in 20 (14.49%) cases. Hepatic flaps were seen in 13 (9.42%) cases and 9 (6.52%) cases presented with hepatic coma. Thirty-two (23.19%) patients were found to be hypertensive.

The haemoglobin level was less than 10 gm% in 83 (60.15%) cases and the mean haemoglobin level was 8.6 ± 2.02 gm%. The mean value of MCV was 98.3 ± 6.43 fl. The mean serum bilirubin level was 6.59 ± 6.61 mg/dL, mean albumin was 2.46 ± 0.7 gm/dL, mean AST was 155.61 ± 85.24 U/L, mean ALT was 81.65 ± 37.59 U/L, mean ALP was 150.59 ± 66 U/L, mean GGTP was 217.30 ± 01 U/L and mean PT was 17.30 ± 4.65 secs. In the study, the mean platelet count was 125, 421.7 ± 65 , 910 per cu mm and the mean WBC count was 9, 183.33 ± 3 , 955.86 per cu mm. The mean prolongation of PT was 5.37 ± 5.02 secs. The AST/ALT ratio was <2 in 86 (62.32%) cases and ≥ 2 in 52 (37.68%) cases and the mean AST:ALT ratio was 1.95 ± 0.67 .

The most common ECG finding was sinus tachycardia (31.88%). Atrial fibrillation was seen in 8.69% cases.

UGI endoscopy was done in 105 cases and the most common finding in UGI endoscopy was oesophageal varices (56.19% cases) (Grade I- 13.32%, Grade II- 26.67%, Grade III- 16.1%), followed by erosions (21.9% cases). Ulcers were seen in 7.6% cases. In the ultrasonography, study of abdomen, cirrhosis of liver was seen in 60.14% cases, fatty liver was seen in 20.29% cases and hepatomegaly with hepatitis was seen in 19.57% cases. Ascites was found in 64.75% and splenomegaly was seen in 44.93% cases. Pancreatitis was seen in 5.07% cases.

It was also observed that 80.53% of the male ALD patients and 44.0% of the female ALD patients were smokers. Overall, 73.91% of the ALD patients were smokers. The average duration of alcohol intake in fatty liver, hepatitis and cirrhosis were 12.77 ± 3.70 , 14.56 ± 6.83 and 20.53 ± 6.08 years, respectively.

As observed, a total of 117 (84.78%) patients were discharged, while 21 (15.22%) patients expired during the hospital stay. The average duration of hospital stay among those that were discharged was 10.35 ± 2.71 days and among those that expired was 13.23 ± 3.52 days. The overall average duration of hospital stay was 10.76 ± 2.9 days.

The study observed that hepatic encephalopathy (42.86%) and hepatorenal syndromes (28.56%) were the major causes of death in which 19.04% of the expired patients died of massive variceal bleed and 9.52% patients died of sepsis.

It is observed that there was significant difference between the mean serum albumin, mean platelet count,

mean ASL/ALT ratio and mean discriminant function of those discharged and those expired during the hospital stay.

DISCUSSION

Alcoholic Liver Disease (ALD) is a major healthcare problem associated with high morbidity and mortality and increased social and economic burden. It may present as an acute condition (hepatitis) or chronic disease (fatty liver, cirrhosis). It presents a wide spectrum of clinical manifestations with multiorgan involvement at a later stage. Although, various risk factors are known to affect the development of liver injury and widely studied in the past, a common consensus is however yet to develop.

The present study is a hospital-based observational study, which included 138 ALD patients admitted in various wards of Department of Medicine, Assam Medical College and Hospital, Dibrugarh, during a period of one year. The clinical profiles of these patients were studied at different stage of ALD.

In this study, males accounted for 81.88% and females accounted for 18.12% of the cases in the ratio of 4.5:1. The female population was higher than previously reported from the region (10%).⁶ Earlier studies conducted in the mainland India reported all male patients (Sarin et al, 1988).⁵ The increase in female population in this study maybe because of differences in cultural and traditional values in North East India from the Indian mainland where the females more commonly indulge in alcoholism. However, Pathak Ok et al also reported a male-to-female ratio of 4:1 in their study in Nepal.¹⁰

The mean age of the patients was 45.91 ± 10.34 years. This was comparable to Sarin et al study (43 ± 8.7 years).¹¹ Majority of the patients (63.04%) were in the age group 31-50 years, which are the most productive years in a person's life.

In this study, the commonest ethnic linguistic group was Tibeto-Burman (44.20%) followed by Austro-Asiatic (31.16%). Indo-Europeans represents 24.64% cases while there were no patients from the Dravidian group. This distribution maybe due to the higher prevalence of many ethnic tribes of Mongoloid origin and tea tribes in this region, which basically come under the Tibeto-Burman and Austro-Asiatic ethnic linguistic groups, respectively.⁸ Various types of country-made alcohol are used very frequently in these groups as part of their day-to-day life. To comment on the role of genetic factors in the causation of the disease in these groups will require further genetic studies.

In the study of socioeconomic group, 71.01% patients were from lower socioeconomic class, 24.64% from the middle socioeconomic class and 4.35% from the upper socioeconomic status class of Kuppuswamy's scale 2012. However, Sarin et al reported much lower number of patients in the lower socioeconomic group, 20%.⁵ Higher number of patients in the lower socioeconomic group in this study maybe due to admission bias in a public sector healthcare institute and the high prevalence of ethnic tribes and tea garden labourers in the area who are mostly poor and illiterate.

Most patients (86.95%) in this study were taking alcohol for more than 10 years with an average duration of 18.09 ± 6.31 years, which is consistent with the earlier population based studies, which documented a duration of 10-12 years of significant alcohol intake for developing the risk of liver disease.¹² The average duration of alcohol intake in fatty liver, hepatitis and cirrhosis patients were 12.16 ± 3.41 , 14.71 ± 6.87 and 20.46 ± 6.10 years, respectively. In this study group, majority of patients (62.32%) were taking alcohol regularly throughout the weekdays and 37.68% were taking alcohol confined to 1-2 days a week regularly.

The role of country-made liquors in the development of ALD had been controversial.⁵ Most patients (75.36%) in this study were not beverage specific. Since, they were taking both foreign as well as country-made liquors, the effect of individual drinks could not be assessed in this study. Due to the prevalence of consuming country-made liquors of various alcohol concentrations in this part of the country, it was not possible to quantify the exact amount of alcohol consumed. In this study, 73.91% of the ALD patients were smokers; among which 80.35% were males and 40.0% were females. Smoking is known to be risk factor in accelerating fibrosis in ALD.

The most common clinical presentation in this study was abdominal distension and swelling of feet (51.45%). Jaundice was seen in 49.28% cases, which is slightly less than Pathak Ok et al study (57.5%).¹⁰ Symptoms of upper GI bleed were present in 29.71% patients in this study, which is comparable Pathak OK et al study (26%).¹⁰ Upper GI bleed in ALD is mostly due to variceal bleed in advanced disease, but also maybe because of gastric erosions or acute haemorrhagic gastritis due to alcohol. Hepatic encephalopathy was seen in 16% cases, which is slightly more than, but comparable with Pathak OK et al study (12.2%).¹⁰

Ascites was observed in 59% patients in this study, which was comparable, but slightly more than Mendenhall et al (50.9%).¹³ Ascites in ALD is seen in decompensated cirrhosis and may also be found in hepatitis. Palpable hepatomegaly was present in 44.20% cases in this study. However, Aswad AI Obeidy et al had reported a higher prevalence (70.8%) in their study.¹⁴ Hepatomegaly is present in >75 cases in fatty liver and hepatitis; it may also be seen in well-compensated alcoholic cirrhosis.¹² Palpable splenomegaly was seen in 36.96% cases in this study, which is slightly more than Pathak OK et al (29.8%).¹⁰ Splenomegaly is considered as a late feature of ALD. The more number of ascites and lesser number of jaundice and palpable hepatomegaly in this study maybe because the study group consisted only of hospitalised patients' majority of which were in the stage of cirrhosis of liver.

Features like parotid swelling (21.01%), gynaecomastia (14.49%), spider naevi (13.77%), Dupuytren's contracture (5.8%) were not very commonly seen though these are said to be more common in alcoholic cirrhosis.

The mean haemoglobin level in this study was 8.6 ± 2.02 gm%, which is slightly less, but comparable with Sarin et al (10.2 gm%).⁵ The mean WBC count in this study was 9183.33/cu mm and the MCV was >98 fl in 65.94%. The

mean value of MCV was 98.3 ± 6.43 fl in this study, which is comparable with Mendenhall et al who reported a mean MCV value of 99.8-102.8 fl.¹³ The mean platelet count in this study was 125, 421.7 ± 65 , 910/cu mm. A higher mean platelet count ($162, 490 \pm 89$, 230 per cu mm) and a lower percentage of platelet count <1,50,000 per cu mm (33.6%) was reported by Pathak Ok et al.¹⁰

The mean AST level in this study was 155.61 ± 85.24 u/L, which is comparable with Pathak Ok et al (142.95 ± 159.85 u/L).¹⁰ The mean ALT level in present study was 81.65 ± 37.59 u/L, which is slightly higher than Mendenhall et al (47-50 u/L).¹³ In the present study, the AST/ALT ratio was ≥ 2 in 37.68% cases, which is comparable with Biswas S et al (32%) study.¹⁵ The mean AST/ALT ratio was 1.95 ± 0.67 . Similar results were reported by Pathak OK et al (2.27 ± 1.33).¹⁰ The AST/ALT ratio is >2 in about 70% of ALD patients, but this maybe of greater value in patients without cirrhosis.¹⁶ The lesser number of patients with AST/ALT ratio >2 in this study maybe because of the greater proportion of cirrhotic patients. The mean serum ALP in present study was 150.59 ± 66 u/L, which was similar to results of Antonio Chedid et al (163-219 u/L) study.¹⁷ Mean serum bilirubin in the present study was 6.59 mg/dL. Average serum albumin in the study was 2.46 ± 0.7 g/dL. Similar results was reported by Mendenhall et al study (2.3-3.7 g/dL).¹³ Average prolongation in the present study was 5.37 ± 5.02 secs.

Chest skiagram showed cardiomegaly in 14.49% cases, opacities suggestive of pulmonary Koch's in 5.81% cases and pneumonitis in 3.62% cases. Among 105 cases in which UGI endoscopy were done, the most common finding was oesophageal varices (51.19%) followed by erosions (21.9% cases). Ulcers were seen in 7.6% cases. These findings were less than that of Aswad Ai Obeidy et al study oesophageal varices (77%), erosions (33.3%) and ulcers (15%).¹⁴ Ultrasonography of whole abdomen showed fatty liver (20.29%), hepatomegaly with hepatitis (19.57%) and cirrhosis of liver (60.14%). Increased number of cirrhotic patients in this study was because more number of cirrhotic patients were admitted in the hospital and patients with fatty liver are usually admitted only with co-morbid conditions.

In patients with cirrhosis of liver, ultrasonography showed splenomegaly in 74.70% cases, whereas clinically splenomegaly was palpable in 61.4% of those cases. Gibson et al reported 52% palpable splenomegaly and 56% splenomegaly on ultrasonography in patients with alcoholic liver disease and portal hypertension.¹⁸ Splenomegaly whether assessed sonographically or clinically is said to be an intensive sign of portal hypertension in patients with chronic liver disease.

In this study, 23.19% patients with ALD were found to be hypertensive and the mean duration of alcohol intake in these patients was 18.06 ± 6.53 years and that of normotensive patients was 17.99 ± 6.16 years. There was no significant difference in the mean duration of alcohol intake of the two groups. However, hypertension was more in males (71.87%) and it was significantly associated with the pattern of alcohol intake confined to 1-2 days a week (p value = 0.04), which is consistent with previous study in

which heavy weekend drinkers were found to have higher daily blood pressure.¹⁹

The higher number of atrial fibrillation may also be explained by the fact of low haemoglobin levels prevalent in the ALD patients. Episodic heavy drinking has been more closely associated with atrial fibrillation. In the present study, AF was more common in males and the pattern of alcohol intake confined to 1-2 days a week was found to be significantly associated with AF (p value=0.015), which is consistent with previous studies.²⁰

During the hospital stay, 15.2% patients expired. Hepatic encephalopathy (42.86%) and hepatorenal syndrome (28.56%) were the major causes of death.

The average duration of hospital stay of those expired during the hospital stay (13.23 ± 3.52 days) was more than that of those discharged (10.35 ± 2.71 days). The overall average duration of hospital stay was 10.76 ± 2.9 days. Pathak Ok et al had reported a mean duration of 13.41 days in their study.¹⁰

Jaundice ($p=0.0006$), ascites at presentation ($p=0.0003$) and hepatic encephalopathy ($p=0.0092$) were found to be significantly associated with mortality. A lower serum albumin, lower mean platelet count, AST/ALT ratio >2 and discriminant function >32 were also found to be associated with mortality, which is consistent with previous studies.

CONCLUSION

Alcoholic Liver Disease (ALD) has a varied clinical and biochemical presentation ranging from the subtle features of fatty liver to obvious findings of decompensated cirrhosis. The various observations made in this study suggest that ALD was more common in males of lower socioeconomic status in their productive years of life. However, the prevalence of ALD in females was found to be higher in this region as compared to other parts of the country. Longer the duration rather than the patterns of alcohol intake was associated with development of liver disease. Jaundice, ascites at presentation, hepatic encephalopathy, lower serum albumin, lower mean platelet count, AST/ALT ratio >2 and discriminant function >32 were found to be significantly associated with mortality.

REFERENCES

- [1] The global status report on alcohol and health. World Health Organization 2011.
- [2] Upadhyay R. Alcoholic liver disease. In: Munjal YP, ed. API Textbook of medicine. 9th edn. Vol.1. New Delhi: Jaypee Brothers 2012:873-877.
- [3] Rehm J, Rehn N, Room R, et al. The global distribution of average volume of alcohol consumption and patterns of drinking. *Eur Addicts Res* 2003;9(4):147-156.
- [4] Bhat N, Yelsangikar A. Alcoholic liver disease. In: Premasis Kar, Singh SP, eds. INASL clinical manual of liver disorders. New Delhi: Elsevier 2012:106-114.
- [5] Sarin SK, Malhotra V, Nayyar A, et al. Profile of alcoholic liver disease in an Indian hospital. A prospective analysis. *Liver* 1988;8(3):132-137.
- [6] Narawane NM, Bhatia S, Abraham P, et al. Consumption of country liquor and its relation to alcoholic liver disease in Mumbai. *J Assoc Physicians India* 1998;46(6):510-513.
- [7] Marsano LS, Mendez C, Hill D, et al. Diagnosis and treatment of alcoholic liver disease and its complications. *Alcohol Res Health* 2003;27(3):247-256.
- [8] Kumar V, Reddy BM. Status of Austro-Asiatic groups in the peopling of India: an exploratory study based on the available prehistoric, linguistic and biological evidences. *J Biosci* 2003;28(4):507-522.
- [9] Kumar N, Gupta N, Kishore J. Kuppuswamy's socioeconomic scale: updating income ranges for the year 2012. *Indian J Public Health* 2012;56(1):103-104.
- [10] Pathak OK, Paudel R, Panta OB, et al. Retrospective study of the clinical profile and prognostic indicators in patients of alcoholic liver disease admitted to a tertiary care teaching hospital in western Nepal. *Saudi J Gastroenterol* 2009;15(3):171-175.
- [11] Sarin SK, Dhingra N, Bansal A, et al. Dietary and nutritional abnormalities in alcoholic liver disease: a comparison with chronic alcoholics without liver disease. *Am J Gastroenterol* 1997;92(5):777-783.
- [12] Carithers RL, Mcclain CJ. Alcoholic liver disease. In: Feldman M, Friedman LS, Brandt LS, eds. Sleisenger and Fordtran's gastrointestinal and liver disease: pathophysiology/diagnosis/management. 9th edn. Philadelphia: Elsevier 2010:1383-1400.
- [13] Mendenhall CL, Anderson S, Weesner RE, et al. Protein-calorie malnutrition associated with alcoholic hepatitis. Veteran's administration cooperative study group on alcoholic hepatitis. *Am J Med* 1984;76(2):211-222.
- [14] Ai-Obeidy A. Gastrointestinal manifestations and alcoholic liver disease. *J Fac Med* 2005;47(1):17-20.
- [15] Biswas S, Paul S, Syeed A, et al. Spectrum of alcoholic liver disease in tribal alcoholics of Chittagong hill tracts of Bangladesh. *Journal of Medicine* 2011;12(1):7-11.
- [16] O'shea R, Dasarathy S, McCullough AJ, et al. Alcoholic liver disease. *Am J Gastroenterology* 2010;51(1):307-328.
- [17] Chedid A, Mendenhall CL, Gartside P, et al. Prognostic factors in alcoholic liver disease. VA cooperative study group. *Am J Gastroenterol* 1991;86(2):210-216.
- [18] Gibson PR, Gibson RN, Ditchfield MR, et al. Splenomegaly-an insensitive sign of portal hypertension. *Aust N Z J Med* 1990;20(6):771-774.
- [19] Wannamethee G, Shaper AG. Alcohol intake and variations in blood pressure by day of examination. *J Hum Hypertens* 1991;5(2):59-67.
- [20] Mukamal KJ, Tolstrup JS, Friberg J, et al. Alcohol consumption and risk of atrial fibrillation in men and women: the Copenhagen City Heart Study. *Circulation* 2005;112(12):1736-1742.