COMPARATIVE STUDY OF DECOMPENSATION PATTERN IN ALCOHOLIC AND VIRAL LIVER DISEASE AND ANALYSIS OF DECOMPENSATION OF MORTALITY

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ABSTRACT

BACKGROUND

Cirrhosis is defined as the histological development of regenerative nodules surrounded by fibrous bands in response to chronic liver injury, which leads to portal hypertension and end-stage liver disease.

The aim of the study is to compare various decompensation patterns in alcohol-related and hepatitis B and hepatitis C virus-related chronic liver disease and to analyse the mortality after decompensation.

MATERIALS AND METHODS

The study was conducted in a tertiary referral hospital between June 2014 - April 2016. It is a prospective observational study of the 385 patients who were diagnosed as suffering from chronic liver disease and managed for various decompensations both on an outpatient and as well on an inpatient basis.

RESULTS

During the study period, a total of 385 patients were diagnosed with chronic liver disease. Among the patients with the diagnosis of CLD, 152 (77.2%) were diagnosed of alcoholic aetiology and 45 (22.8%) of viral aetiology liver disease. The most common forms of decompensation in alcoholic chronic liver disease were found to be ascites (71.7%), jaundice (56.6%) and oesophageal varices (32.2%). The most common forms of decompensations in viral-related chronic liver disease were jaundice (42.2%), ascites (35.6%) and oesophageal varices (28.9%). Patients with viral-related CLD were diagnosed with higher incidence of hepatocellular carcinoma of (24.4%) compared to only 5.3% of patients of alcoholic liver disease. Ascites was found to be the most common form of decompensation associated with mortality (76%). Jaundice (56%), hepatorenal syndrome (44%) and hepatic encephalopathy (24%) were the other common decompensations associated with mortality.

CONCLUSION

In this study, ascites was found to be most common form of decompensation patterns in alcoholic liver disease and jaundice in viral-related CLD. The incidence of hepatocellular carcinoma was found to be higher in viral aetiology CLD. Ascites was found to be the most common form of decompensation associated with mortality.

KEYWORDS

Chronic Liver Disease, Decompensation.

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BACKGROUND

Cirrhosis is defined as the histological development of regenerative nodules surrounded by fibrous bands in response to chronic liver injury, which leads to portal hypertension and end-stage liver disease.[1]

Decompensation of liver cirrhosis can be either attributed to portal hypertension (i.e., variceal bleeding, ascites), loss of hepatic function (i.e., jaundice, hepatic encephalopathy), hepatocellular carcinoma or impaired immunity leading to bacterial infections and sepsis.[2]

As per WHO middle-east and Indian subcontinent, an estimates 2-5% of the general population is chronically infected with hepatitis B.

There are several histological models of liver cirrhosis. The histological models of injury in liver cirrhosis vary due to the aetiology. Perisinusoidal fibrosis is dominant in alcoholic liver disease versus periportal fibrosis in viral or autoimmune liver disease.[3] Evidences suggest that the prognosis depends strongly on aetiology of liver cirrhosis.[4,5]

Alcoholic liver disease is the major cause of chronic liver disease worldwide and can lead to fibrosis and cirrhosis.[6] Alcoholic liver disease has been estimated to account for 48% of all deaths due to cirrhosis.[7] The development of alcoholic liver disease is still controversial. Alcohol has a threshold effect rather than a dose-response effect on mortality from alcoholic cirrhosis.[8] In alcohol misusers, a dose dependent increase in relative risk of developing alcohol-induced liver disease is seen.[9] The burden of alcohol-related disease is highest in the developed world where it can account for 9.2% of disability- adjusted life years.[10]

Our study hypothesised that the pattern of decompensation may be related to the natural history of the disease and the histopathological changes as a consequence of the disease. Thus, the pattern of cirrhosis will vary depending upon the aetiology. The prognosis and survival will depend on the type and severity of decompensation.

Aim of the Study- To compare the various decompensation patterns between alcoholic-related liver cirrhosis and hepatitis B and C related liver cirrhosis and analyse the F.

MATERIALS AND METHODS

385 patients who presented to the outpatient department or undergoing admission in our department were enrolled in the study. The study period was between June 2014 and April 2016.

Inclusion Criteria

1. Patients with alcohol aetiology CLD.
2. Patients with hepatitis B virus-related CLD.
3. Patients with hepatitis C virus-related CLD.

Exclusion Criteria

1. Patients with NASH, autoimmune aetiology CLD, Wilson's disease, haemochromatosis and cryptogenic aetiology CLD.
2. Patients with viral and alcoholic disease overlap CLD.
3. Paediatric patients.

Definitions- The subjects were divided into two groups.
Group A - Alcoholic liver cirrhosis.
Group B - Hepatitis B and C related liver cirrhosis.

Group A- Alcoholic liver disease group is defined as ingestion of >60-80 g/day of alcohol in men and >20-40 g/day in women along with radiological and biochemical evidence of liver disease.
Group B - Viral liver disease group is diagnosed as per CDC guidelines along with radiological and biochemical evidence of liver disease.

Hepatitis B- Presence of hepatitis B surface antigen, HBV DNA levels.

Hepatitis C - Screening assay (EIA or CIA) for anti-HCV. Verification by an additional, more specific assay; e.g. - Nucleic Acid Testing (NAT) for HCV-RNA.

Decompensation was diagnosed by the following parameters.

1. Ascites (clinical examination and radiology).
2. Jaundice (bilirubin >3 times the upper limit of normal).
3. Hepatorenal syndrome (raised S. creatinine, decreased urine output, normal renal imaging and in the absence of other cause of renal failure).
4. Spontaneous bacterial peritonitis (clinical features with neutrophilia >250/mm3 in ascitic fluid).
5. Oesophageal varices and portal hypertensive gastropathy, bleeding (endoscopic examination).
6. Hepatic encephalopathy (clinical assessment).
7. Hepatocellular carcinoma (diagnosed by MRI or CT scan + serum AFP). Statistical analysis was done using standard tests.

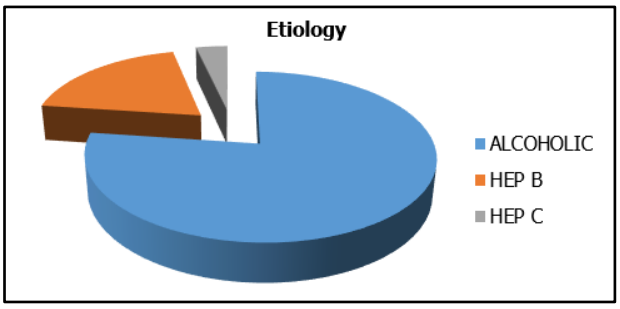
RESULTS

Total number of patients- 385.
The following set of patients was excluded from the study.
Other aetiology- 108.
Paediatric population- 57.
Overlap between aetiology- 23.

The basic demographic profile as in Table 1 and 2. A total of 197 people were enrolled in the study, i.e. n=197.

Group	Number of Patients	Percentage
Group A	152	77.2
Group B	45	22.8
Total	**197**	**100**

Table 1. Study Group Distribution as Per Aetiology

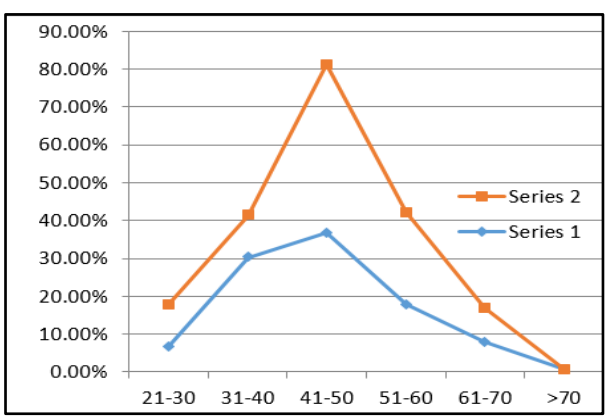


Graph 1. Aetiology of Liver Disease Wise Distribution of Study Population

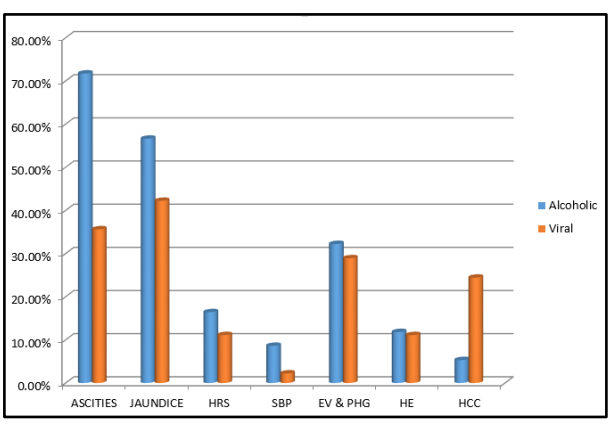
Alcoholic liver disease was present = 152 patients (77.2%), viral-related liver disease = 45 patients (22.8%).
Hepatitis B = 38 (84.4%) %.
Hepatitis C = 7 (15.6%) %.

Age in Years	Group A	Group B	Total
21-30	10 (6.6%)	5 (11.1%)	15 (7.6%)
31-40	46 (30.3%)	5 (11.1%)	51 (25.9%)
41-50	56 (36.8%)	20 (44.4%)	76 (38.6%)
51-60	27 (17.8%)	11 (24.4%)	38 (19.3%)
61-70	12 (7.9%)	4 (8.9%)	16 (8.1%)
>70	1 (0.7%)	0 (0%)	1 (0.5%)
Total	**152 (100%)**	**45 (100%)**	**197 (100%)**
Mean ± SD	**45.30 ± 9.73**	**47.13 ± 10.49**	**45.72 ± 9.91**

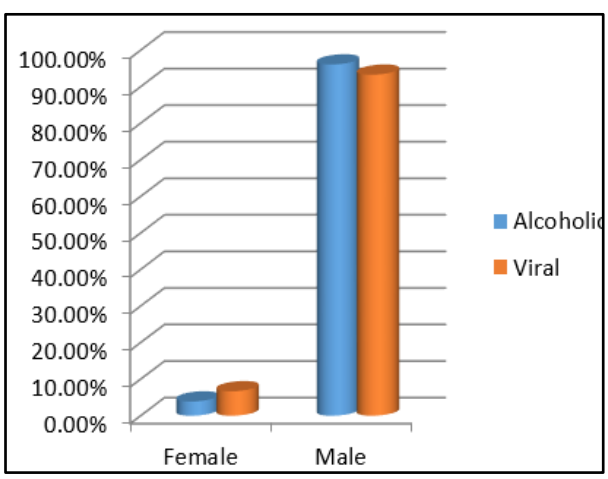
Table 2. Comparison of Age



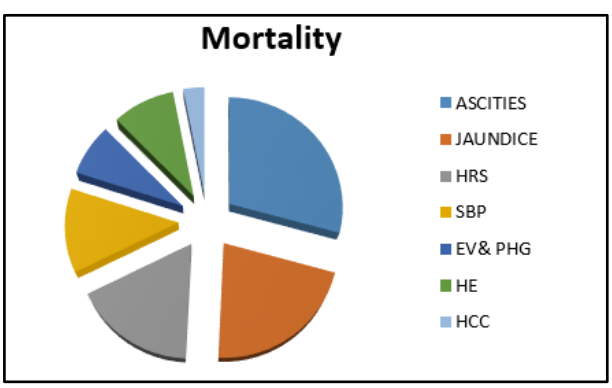
Graph 2. Age Distribution in the Study Group



Graph 4. Comparison of Decompensation between the Groups



Graph 3. P Value = 0.429, Not Significant, Chi-Square Test



Graph 5. Mortality Data in Relation to Decompensation Pattern

Gender	Group A	Group B	Total
Female	6 (3.9%)	3 (6.7%)	9 (4.6%)
Male	146 (96.1%)	42 (93.3%)	188 (95.4%)
Total	**152 (100%)**	**45 (100%)**	**197 (100%)**

Table 3. Age Distribution of Patients Studied p Value = 0.276, not Significant, Student's t-Test

Sl. No.	Decompensation	Group A (Alcoholic)	Group B (Viral)	Total	P Value
1.	Ascites	109 (71.7%)	16 (35.6%)	125 (63.5%)	P<0.001**, significant, Chi-square test
2.	Jaundice	86 (56.6%)	19 (42.2%)	105 (53.3%)	P=0.090, significant, Chi-square test
3.	Hepatorenal syndrome	25 (16.4%)	5 (11.1%)	30 (15.2%)	P=0.381, not significant, Chi-square test
4.	Spontaneous bacterial peritonitis	13 (8.6%)	1 (2.2%)	14 (7.1%)	P=0.196, not significant, Chi-square test
5.	Oesophageal varices and PHG	49 (32.2%)	13 (28.9%)	62 (31.5%)	P=0.671, not significant, Chi-square test
6.	Hepatic encephalopathy	18 (11.8%)	5 (11.1%)	23 (11.7%)	P=0.893, not significant, Chi-square test
7.	Hepatocellular carcinoma	8 (5.3%)	11 (24.4%)	19 (9.6%)	P=0.001**, significant, Chi-square test

Table 4. Comparison of Decompensation between the Groups

	Group A (Alcoholic)	Group B (Viral)	Total	P value
Mortality	19 (12.5%)	6 (13.3%)	25 (12.7%)	P=0.883, not significant, Chi-square test

Sl. No.	Decompensation	Total	Percentage
1.	Ascites	19	76%
2.	Jaundice	14	56%
3.	Hepatorenal syndrome	11	44%
4.	Spontaneous bacterial peritonitis	8	32%
5.	Oesophageal varices and portal hypertensive gastropathy	5	20%
6.	Hepatic encephalopathy	6	24%
7.	Hepatocellular carcinoma	2	8%

Table 6. Analysis of Data on Mortality in Relation to Decompensation

DISCUSSION

This study is an attempt to analyse the pattern of decompensation between the two common aetiologies in our community, namely the alcohol and viral-related chronic liver disease.

Bouchier and colleagues had concluded that in patients with alcoholic liver disease, survival is reduced compared to age and sex-matched general population and sex of the patient was of marked significance in determining the outcome of alcoholic liver disease.[11]

In a study by Yun-Fan Liaw and colleagues have shown that cirrhosis will develop at a minimal annual rate of 2.1% in patients with chronic hepatitis B.[12]

Yearly decompensation rates for viral hepatitis C is 4%, for viral hepatitis B is 10%. Yearly decompensation for alcoholic cirrhosis is even more rapid.[13]

Although, total number of patients affected with viral aetiology in our study is 68. We had to exclude a total of 23 patients who had a significant aetiological overlap. This exclusion (33.82%) is to prevent any bias in the viral aetiology group.

Our study population had only 57 (14.8%) paediatric patients. This is because our department is a liver transplant centre, which caters only adult, hence there may be a referral bias.

Both the groups were comparable for age and sex. We have seen that mainly middle-aged people are affected in both the groups. This shows that the economically viable strata of the society are more affected by the disease of both aetiologies.

Female population was significantly less 9 (4.6%). This may be considered as bias in the study; it maybe that incidentally during the study period, we had less female referrals. The other factor maybe the rural female population may have some social inhibition to come to referral centre after the primary physician advice in both alcohol and viral disease.

Ascites is the most common of the three major complications of cirrhosis. The others being variceal haemorrhage and hepatic encephalopathy. It is one of the leading causes for hospital referral.[14]

Our study showed ascites in (125 patients) 63.5%, of which (109 patients) 71.7% were alcoholic and[16] 35.6% were viral related. This was statistically significant p value <0.001** (Chi-square test).

The other two decompensation did not show any statistically significant difference between the groups. Oesophageal varices total incidence in 62 patients (31.5%). Alcoholic groups 49 patients (32.2%). Viral group 13 patients (28.9%), p value = 0.671 (Chi-square test). In this study, we initially included gastrointestinal bleed as one factor for comparison, but later on, we removed it due to following reasons. Patients were treated elsewhere due to the emergency nature, occult bleed were missed and difference in quantification.

Hepatic encephalopathy was present in 23 patients (11.7%), alcohol group 18 patients (11.8%) and viral group 5 patients (11.1%), this was not statistically significant p = 0.893 (Chi-square test). We feel that a significant number of people with covert hepatic encephalopathy are missed as we have not done any specific test to diagnose covert HE. This maybe one of the flaw of the study as good quantum of underestimation has happened.

Some studies have shown ascites, variceal bleed and encephalopathy as the most common three major complications in cirrhosis. Our study had jaundice as second most common form of decompensation, which brought the patients to the treating physician. It had a total incidence in 105 patients (53.3%). Between the groups - alcoholic had 86 patients (56.6%) and viral had 19 (42.2%) patients. This was statistically significant P = 0.090 + (Chi-square test). This was because of the ease in picking up the clinical symptomology and awareness in our community about the disease process.

Hepatorenal syndrome and spontaneous bacterial peritonitis had no significant presence in both groups. Hepatorenal syndrome was diagnosed in 30 patients (15.2%) and spontaneous bacterial peritonitis in 14 patients (7.1%). They had no statistically significant difference between the groups. Hepatorenal syndrome (p value = 0.381, not significant Chi-square test) and spontaneous bacterial peritonitis (p value = 0.196, not significant Chi-square test).

Hepatocellular carcinoma had a total incidence in 19 patients (9.6%). It was present in 11 patients (24.4%) in viral group and in 8 patients (5.3%) in alcoholic liver disease group, which is statistically significant 'p' value = 0.001 (Chi-square test). This is because of known fact of increased incidence in hepatitis B disease.

We have not compared the decompensation between the groups at the time of death. This is because the number of patients is very less and no conclusions can be confidently derived.

Ascites was present in about 19/25 patients, but we had included minimal-to-moderate ascites on scan. This may not be contributing to mortality. Jaundice was present in 14/25 patients. This reflects the significant compromise in liver function at the time of death. Decompensation with ascites and sepsis with SIRS predict reduced survival.[15]

Hepatorenal syndrome was present in 11/25 patients. Significant renal compromise leading to acidosis, uraemia and fluid overload was observed at the time of death.

Spontaneous bacterial peritonitis was seen in 8/11 patients. Recurrent bacterial peritonitis and multidrug-resistance organisms were present. But, to note the coincidence of hepatorenal syndrome and spontaneous bacterial peritonitis had significant mortality of up to 86% in our study.

Variceal bleed was present in 5/25 patients at the time of death, but portal hypertensive gastropathy leading to anaemia as an associated factor leading to mortality has not been separately analysed in our study.

Hepatic encephalopathy was seen in 6/25 patients. These patients also had other decompensations, grade 4 hepatic encephalopathy as the main cause of mortality was present in only one patient.

Hepatocellular carcinoma was present in just 2/25 of our patients and this was not directly related to mortality.

The mortality in a group of patients with alcoholic cirrhosis is higher than in those with viral cirrhosis. Moreover, ascites in combination with other complications, hepatorenal syndrome, gastrointestinal haemorrhage and spontaneous bacterial peritonitis association are independent predictors of mortality in patients with complicated liver cirrhosis.[16]

CONCLUSION

This study has shown that alcoholic liver disease patients are more commonly decompensated with ascites and jaundice than viral liver disease. Hepatocellular carcinoma is a common decompensation in viral liver disease than alcoholic liver disease. An attempt was made to analyse the commonest decompensation leading to mortality, but it could not be done.

REFERENCES

[1] Kristani P, Kurti F, Xinxo S, et al. Different models of decompensation in alcoholic versus non-alcoholic cirrhotic patients. International Journal of Science and Research (IJSR) 2015;4(11):1786-1789. www.ijsr.net.

[2] Garcia-Tsao G, Friedman S, Iredale J, et al. Now there are many (stages) where before there was one: in search of a pathophysiological classification of cirrhosis. Hepatology 2010;51(4):1445-1449.

[3] Wiegand J, Kühne M, Pradat P, et al. Different patterns of decompensation in patients with alcoholic vs. non-alcoholic liver cirrhosis. Aliment Pharmacol Ther 2012;35(12):1443-1450.

[4] Sorensen HT, Thulstrup AM, Mellemkjar L, et al. Long-term survival and cause-specific mortality in patients with cirrhosis of the liver: a nationwide cohort study in Denmark. J Clin Epidemiol 2003;56(1):88-93.

[5] Saunders JB, Walters JR, Davies P, et al. A 20-year prospective study of cirrhosis. BMJ (Clin Res Ed) 1981;282(6260):263-266.

[6] Gao B, Bataller R. Alcoholic liver disease: pathogenesis and new therapeutic targets. Reviews in basic and clinical gastroenterology and hepatology. Gastroenterology 2011;141(5):1572-1585.

[7] Rehm J, Samokhvalov AV, Shield KD. Global burden of alcoholic liver diseases. Journal of Hepatology 2013;59(1):160-168.

[8] Kamper-Jorgensen M, Gronbaek M, Tolstrup J, et al. Alcohol and cirrhosis: dose-response or threshold effect? J Hepatol 2004;41(1):25-30.

[9] Becker U, Deis A, Sorensen TI, et al. Prediction of risk of liver disease by alcohol intake, sex and age: a prospective population study. Hepatology 1996;23(5):1025-1029.

[10] O'Shea RS, Dasarathy S, McCullough AJ, et al. Alcoholic liver disease. Hepatology 2010;51(1):307-328.

[11] Bouchier IA, Hislop WS, Prescott RJ. A prospective study of alcoholic liver disease and mortality. J Hepatol 1992;16(3):290-297.

[12] Liaw YF, Chu CM. Hepatitis B virus infection. Lancet 2009;373(9663):582-592.

[13] Schuppan D, Afdhal NH. Liver Cirrhosis. Lancet 2008:371(9615):838-851.

[14] Spadaro A, Luigiano C, De Caro G, et al. Prognostic factors of survival in complicated viral and alcoholic cirrhosis without hepatocellular carcinoma. A retrospective study. Minerva Gastroenterol Dietol 2007;53(4):311-319.

[15] Das K, Das K, Datta S, et al. Course of disease and survival after onset of decompensation in hepatitis B virus-related cirrhosis. Liver Int 2010;30(7):1033-1042.

[16] Jepsen P, Ott P, Andersen PK, et al. Clinical course of alcoholic liver cirrhosis: a Danish population-based cohort study. Hepatology 2010;51(5):1675-1682.