

Evaluation of Renal Manifestations in Liver Cirrhosis Patients: An Observational Study

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ABSTRACT

Background: Liver fibrosis and its related complications continue to represent a significant worldwide healthcare burden. The major complications of cirrhosis include varices, ascites, hepatic encephalopathy (HE), hepatopulmonary hypertension, hepatocellular carcinoma, hepatorenal syndrome, spontaneous bacterial peritonitis, and coagulation disorders. Hence; we planned the present study to assess the renal complications in liver cirrhosis patients.

Materials & Methods: The present study included assessment of renal complications in liver cirrhosis patients. A total of 30 liver cirrhosis patients were included. Liver disease was staged according to Child-Pugh's grading. All the results were recorded and analyzed.

Results: A total of 30 patients were included in the present study. Alcohol was etiologic profile in the 46.67 percent of the patients. Statistically significant results were obtained while comparing the renal profile and severity of liver cirrhosis.

Conclusion: Significant correlation exists between the renal profile and hepatic profile in cirrhosis of liver patients.

Key words: Cirrhosis, Liver, Renal.

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INTRODUCTION

Liver fibrosis and its related complications continue to represent a significant worldwide healthcare burden. Over the past decade there has been considerable improvement in our understanding of the cellular mechanisms and pathophysiology underlying hepatic fibrosis.^{1,2} This greater insight into the relevant basic sciences may lead to the development of novel treatment strategies designed to block the fibrogenic cascade or even enhance matrix degradation. In addition, there have been significant advances in the management of the complications of cirrhosis, with specific treatments now available for some conditions.^{3,4}

The major complications of cirrhosis include varices, ascites, hepatic encephalopathy (HE), hepatopulmonary hypertension, hepatocellular carcinoma, hepatorenal syndrome, spontaneous bacterial peritonitis, and coagulation disorders. These can occur secondary to portal hypertension, abnormal synthetic function, or combination of both.⁵⁻⁷ Hence; we planned the present study to assess the renal complications in liver cirrhosis patients.

MATERIALS & METHODS

The present study was planned in the department of general medicine of R.B.M. Hospital, Bharatpur, Rajasthan, and included assessment of renal complications in liver cirrhosis patients. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the

entire research protocol. A total of 30 liver cirrhosis patients were included in the present study and were evaluated for the presence of renal complications.

Exclusion Criteria

- Patients of history of any form of acute or chronic liver illness
- Patients with presence of ischemic heart disease
- Patients with underlying collagen disease
- Patients having any malignancy related to hepatocellular region
- Patients with any known drug allergy

After meeting the exclusion criteria, a total of 30 liver cirrhosis patients were included in the present study. Physical examination was carried out in all the patients along with obtaining the detailed past medical history.

Complete demographic details of all the patients were also obtained. Hematological tests like hemoglobin, white blood cell count, differential count, platelet count and prothrombin time. Biochemical tests like random blood sugar, blood urea, serum creatinine, serum uric acid, serum electrolytes and liver function tests including total and differential protein.

Liver disease was staged according to Child-Pugh's grading as described previously in the literature.⁸ Child Pugh grading system calculates points based on the serum total bilirubin levels, serum albumin levels, INR value, severity of Ascites and severity of

hepatic encephalopathy. Based on these parameters, a scores are calculated and scoring system as assessed as follows:^{8,9}

Child Pugh Grade	Points
A	5- 6
B	7- 9
C	10- 15

Statistical Analysis

All the results were analyzed by SPSS software. Chi- square test and student t test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 30 patients were included in the present study. Alcohol was etiologic profile in the 46.67 percent of the patients. Nonalcoholic steatohepatitis (NASH) was the etiologic factor seen in 23.33 percent of the patients. In 20 percent of the patients, hepatitis C was the etiologic factor. 14 liver cirrhosis patients were categorized with Child Pugh score B. While comparing the blood urea levels and severity of liver cirrhosis, significant results were obtained (P-value < 0.05). Statistically significant results were obtained while comparing the serum creatinine levels and severity of liver cirrhosis (p- value < 0.05).

Table 1: Distribution of subjects according to Aetiology

Cause of cirrhosis	Frequency	Percentage
Alcohol	14	46.67
NASH	7	23.33
Hepatitis C	6	20
Others	3	10
Total	30	100

Table 2: Distribution of subjects according to Child Pugh Score

Parameter	Frequency	Percentage
A	8	26.7
B	14	46.6
C	8	26.7
Total	30	100

Table 3: Distribution of patients with Blood urea and severity of liver cirrhosis

Blood urea	Child Pugh Score			Total	P- value
	A	B	C		
Normal	6	11	4	21	0.00*
Raised	2	3	4	9	
Total	8	14	8	30	

*: Significant

Table 4: Distribution of patients with Serum creatinine and severity of liver cirrhosis

Serum creatinine	Child Pugh Score			Total	P- value
	A	B	C		
Normal	6	11	4	21	0.00*
Raised	2	3	4	9	
Total	8	14	8	30	

*: Significant

DISCUSSION

In the present study, we observed a significant correlation between the renal parameters and severity of cirrhosis of liver. Woitas RP et al evaluated RFR in decompensated cirrhotics with ascites. Steady-state inulin- and para- aminohippurate (PAH) clearances were performed at rest and during amino acid infusion in 22 patients with decompensated liver cirrhosis and ascites. In patients with liver cirrhosis and ascites, amino acid infusion improves kidney function.¹⁰ Trevisani F et al evaluated the hemodynamic status and autonomic function in 30 patients with cirrhosis, most of them with an advanced stage of the disease. Autonomic function was assessed with 7 cardiovascular tests exploring the vagal or sympathetic function. Each test was scored

from 1 to 3 (normal, borderline, altered). Cardiac index (CI) was measured by an echocardiogram. Twenty-four (80%) patients showed an AD, this being definite in 14 (47%) patients. A vagal dysfunction (VD) was found in 19 patients (63%), this being definite in 11 patients (37%), and a sympathetic dysfunction (SD) in 7 patients (definite in 3 [10%] patients). The patients with AD showed a faster heart rate (P 5 .021), lower indicized peripheral vascular resistance (P 5 .013), and increased CI (P 5 .004) than patients without AD whereas mean arterial pressure did not differ. Similar results were seen by grouping patients according to the VD. AD score was directly correlated with heart rate (r 5 0.53; P 5 .002) and CI (r 5 0.45; P 5 .016), and inversely correlated with peripheral vascular resistance (r 5 0.46; P 5 .013). Even closer

correlations were found with vagal score. AD (mainly VD) may be involved in the pathogenesis of the hyperdynamic circulatory syndrome of patients with advanced cirrhosis.¹¹

Bernardi M et al evaluated the systemic hemodynamics, measured by Doppler-echocardiography, atrial natriuretic factor, plasma renin activity and plasma norepinephrine, in 10 patients with cirrhosis and ascites and 10 healthy controls, after 2 h of standing and during lying down for a further 2 h. Standing hemodynamic patterns of controls and patients with cirrhosis did not differ significantly. The latter, however, showed higher plasma renin activity, norepinephrine and atrial natriuretic factor. The assumption of the supine position led to greater increases in cardiac index and atrial natriuretic factor, and reduction in systemic vascular resistance in patients with cirrhosis. Norepinephrine and plasma renin activity declined in both groups to a similar extent, while heart rate only slowed in controls. Thus, after 2 h in the supine position, patients with cirrhosis showed hyperdynamic circulation with increased cardiac index and heart rate and reduced systemic vascular resistance. Norepinephrine, plasma renin activity and atrial natriuretic factor were also elevated. The hyperdynamic circulation in advanced cirrhosis appears during or is enhanced by lying down. This finding suggested that this syndrome is, at least in part, attributable to excessive blood volume translocation towards the central area. However, the persistent activation of renin-angiotensin and sympathoadrenergic systems suggested that a concomitant reduced vascular sensitivity to vasoconstrictors concurs in its development.¹² Kim JK et al investigated the prevalence and clinical significance of renal dysfunction due to bacterial infections other than SBP in patients with liver cirrhosis. Eighty patients were recruited for the analysis. The types of infections included that of urinary tract (37.5%), pneumonia (23.8%), biliary tract (20%), cellulitis (12.5%), and bacteremia of unknown origin (6.3%). Renal dysfunction developed in 29 patients (36.3%), of which 11 patients had irreversible renal dysfunction. The initial MELD score, neutrophil count, albumin, and blood pressure were significant risk factors in the univariate analysis, whereas only the MELD score was an independent risk factor for the development of renal dysfunction ($p < 0.001$) after multivariate analysis. The prevalence of renal dysfunction during bacterial infection other than SBP in patients with liver cirrhosis was 36.3%, and its development was related to the severity of the liver disease. Occurrence of irreversible renal dysfunction seemed to affect the prognosis of these patients.¹³

CONCLUSION

From the above results, the authors concluded that significant correlation exist between the renal profile and hepatic profile in cirrhosis of liver patients. However; future studies are recommended.

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