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Original Research

Assessment of renal function in chronic liver diseases

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ABSTRACT:
Background: Fibrosis and cirrhosis are the results of the progressive destruction and regeneration of the liver parenchyma in chronic liver disease. The present study was conducted to assess the renal function in chronic liver diseases. **Materials & Methods:** 58 patients with chronic liver disease of both genders were assessed for serum potassium, sodium, urea, and creatinine were measured to evaluate kidney function. **Results:** Out of 58 patients, males were 32 and females were 26. Etiology was alcoholic liver disease in 30, chronic Hepatitis- B in 14, chronic Hepatitis- C in 8 and autoimmune hepatitis in 6 patients. The difference was significant (P< 0.05). Serum urea 15-40 mg/dl was seen in 49 and >40 mg/dl in 9 patients. Creatinine 1 mg/dl was seen in 48 and 2 mg/dl in 10 patients. Serum albumin <3 gm/dl was seen in 47, 3-3.5 gm/dl in 5 and >3.5gm/dl in 6 patients. Serum globulin <2.5 gm/dl was seen in 46, 2.5-4 gm/dl in 5 and >4 gm/dl in 7 patients. **Conclusion:** Authors have found significant association between severity of liver dysfunction and some parameters of renal dysfunction.
Keywords: chronic liver disease, renal function, Urea

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INTRODUCTION

In our nation, chronic liver disease is a prevalent clinical issue.Fibrosis and cirrhosis are the results of the progressive destruction and regeneration of the liver parenchyma in chronic liver disease.[1] Numerous exogenous and endogenous indicators of kidney function, as well as acute renal damage and chronic kidney disease, are still the subject of extensive research in various patient populations.[2] Renal impairment is a poor prognostic indication if it exists in both groups. A distinct type of renal failure linked to cirrhosis or advanced liver disease, hepato-renal syndrome is defined by functional renal impairment without appreciable alterations in renal histology.[3]

Renal failure is often a complication of chronic liver disease and cirrhosis, and this combination increases morbidity and death significantly.[4] Significant evidence suggests that circulatory function abnormalities, notably a decrease in system vascular resistance from primary arterial vasodilatation in the splanchnic circulation brought on by portal hypertension, are the primary cause of renal failure in cirrhosis patients. Patients with alcoholic cirrhosis and hepatitis B or C may develop intrinsic renal disorders.Additionally, those who have cirrhosis may experience type-I hepatorenal syndrome, a particular kind of acute renal failure.[5,6] Patients with cirrhosis may experience chronic renal injury from conditions like diabetes mellitus, hypertension, and atherosclerosis, even in the absence of an acute renal failure event.[7]The present study was conducted to assess the renal function in chronic liver diseases.

MATERIALS & METHODS

The present study was conducted on 58 patients with chronic liver disease of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Biochemical testing was performed, including blood work for hemoglobin, total and differential counts, ESR, fasting and postprandial sugar levels. Numerous

laboratory tests were conducted, including total bilirubin with both conjugated and unconjugated fraction, total protein, albumin,globulin, prothrombin time, aspartate amino transferase S, alanine amino transferase, alkaline phosphatase, anti-nuclear antibody, and anti-liver kidney microsomal antibodies 1, 2, and 3. To determine the cause and severity of chronic liver disease, ascitic fluid was studied. Serum potassium, sodium, urea, and creatinine were measured to evaluate kidney function.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 58		
Gender	**Male**	**Female**
Number	32	26

Table I shows that out of 58 patients, males were 32 and females were 26.

Table II Assessment of etiology

Etiology	Number	P value
Alcoholic liver disease	30	0.05
chronic Hepatitis- B	14	
chronic Hepatitis-C	8	
Autoimmune hepatitis	6	

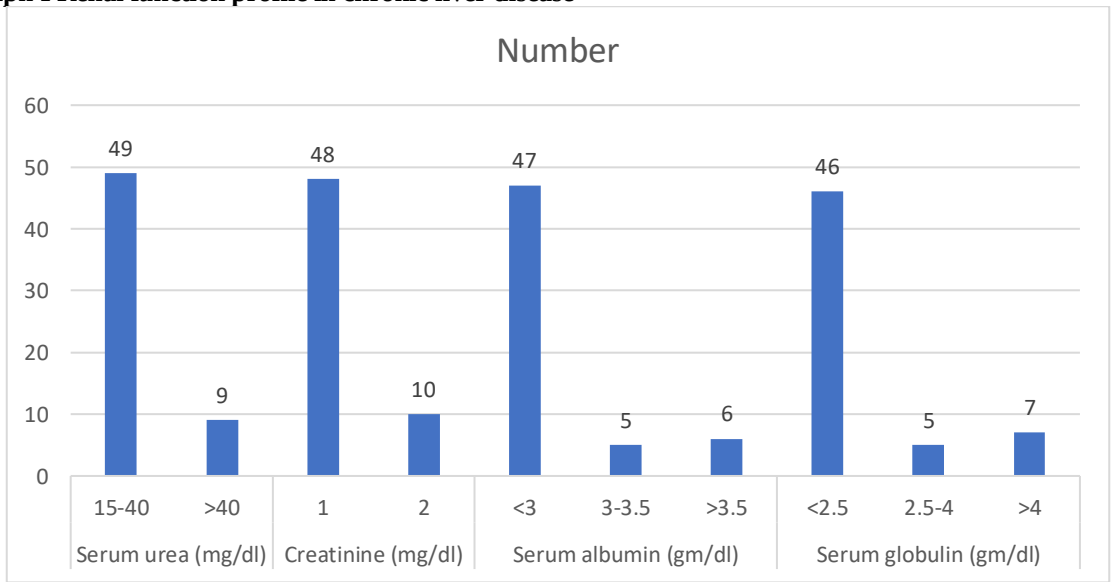
Table II shows that etiology was alcoholic liver disease in 30, chronic Hepatitis- B in 14, chronic Hepatitis- C in 8 and autoimmune hepatitis in 6 patients. The difference was significant (P< 0.05).

Table III Renal function profile in chronic liver disease

Parameters	Variables	Number	P value
Serum urea (mg/dl)	15-40	49	0.01
	>40	9	
Creatinine (mg/dl)	1	48	0.01
	2	10	
Serum albumin(gm/dl)	<3	47	0.04
	3-3.5	5	
	>3.5	6	
Serum globulin(gm/dl)	<2.5	46	0.05
	2.5-4	5	
	>4	7	

Table II, graph I shows that serum urea 15-40mg/dl was seen in 49 and >40mg/dl in 9 patients. Creatinine 1mg/dl was seen in 48 and 2mg/dl in 10 patients. Serum albumin <3gm/dl was seen in 47, 3-3.5gm/dl in 5 and >3.5gm/dl in 6 patients. Serum globulin<2.5gm/dl was seen in 46, 2.5-4gm/dl in 5 and >4gm/dl in 7patients.

Graph I Renal function profile in chronic liver disease



DISCUSSION

Renal failure in the context of chronic liver disease (CLD) typically refers to a condition known as hepatorenal syndrome (HRS).[8,9] Hepatorenal syndrome is a serious complication of advanced liver disease, where there is a progressive and often rapid decline in kidney function.[10]Hepatorenal syndrome occurs due to changes in circulation and blood flow within the liver and kidneys. In advanced liver disease, there is increased resistance to blood flow through the liver (portal hypertension) and systemic vasodilation, which leads to decreased effective blood volume and perfusion to the kidneys.There are two types of hepatorenal syndrome.[11,12]Type 1: Rapidly progressive renal failure characterized by a doubling of serum creatinine to a level greater than 2.5 mg/dL within 2 weeks.Type 2: A slower progression of renal dysfunction, where serum creatinine levels may rise more gradually.Patients with hepatorenal syndrome typically present with worsening renal function (increased serum creatinine), oliguria (reduced urine output), and retention of sodium and water. They may also have signs of advanced liver disease such as ascites (fluid buildup in the abdomen) and hepatic encephalopathy (brain dysfunction due to liver failure).[13]The present study was conducted to assess the renal function in chronic liver diseases.

We found that out of 58 patients, males were 32 and females were 26. Etiology was alcoholic liver disease in 30, chronic Hepatitis- B in 14, chronic Hepatitis- C in 8 and autoimmune hepatitis in 6 patients. FasolatoS et al[14]investigated the prevalence and clinical course of renal failure. 233 patients (75.4%) had evidence of ascites. In 104 patients with cirrhosis and ascites (44.6%) a bacterial infection was diagnosed. A bacterial infection-induced renal failure was observed in 35 of 104 patients (33.6%). The prevalence of renal failure was higher in biliary or gastrointestinal tract infections and in spontaneous bacterial peritonitis (SBP) and in than in other types of infections. In addition, the progressive form of renal failure was only precipitated by biliary or gastrointestinal tract infections, SBP, and urinary tract infections (UTI). In a multivariate analysis only MELD score (P = 0.001), the peak count of neutrophil leukocyte in blood (P = 0.04), and the lack of resolution of infection (P = 0.03) had an independent predictive value on the occurrence of renal failure.

We found that serum urea 15-40 mg/dl was seen in 49 and >40 mg/dl in 9 patients. Creatinine 1 mg/dl was seen in 48 and 2 mg/dl in 10 patients. Serum albumin <3 gm/dl was seen in 47, 3-3.5 gm/dl in 5 and >3.5gm/dl in 6 patients. Serum globulin <2.5 gm/dl was seen in 46, 2.5-4 gm/dl in 5 and >4 gm/dl in 7 patients. Das et al[15]assessed the renal function in chronic liver diseases and find out the association of alteration of renal function with gradation of liver disease and to find out the association of alteration of renal function among the cases of chronic liver disease of different aetiology. Eighty six percent of the patients were male and the mean age of study population was 43.58 y, 68% patients suffered from alcoholic liver disease, followed by 14% patients had chronic Hepatitis-B, 10% patients developed acute kidney injury, 20% had hepato renal syndrome and 14% had IgA deposition. The distribution of serum urea and creatinine across the categories of Child Pugh classification was statistically significant.

The shortcoming of the study is small sample size.

CONCLUSION

Authors have found significant association between severity of liver dysfunction and some parameters of renal dysfunction.

REFERENCES

1. Betrosiun AP Agarwal B, Douzinas EE: Acute renal dysfunction in liver disease. World J Gastroenterol. 2007;13(42):5552-59.
2. Eren Zehra, KantaruGulein. Assessment of renal functions in patients with liver disease: which one is correct? BANTAO Journal. 2010;8(1):9-12.
3. Gines Perez, Schrier W Robert. Renal failure in cirrhosis. N Engi J Med. 2009;361:1279-90.
4. Caronia S, Taylor K, Pagliaro L, et al. Further evidence for an association between non-insulin-dependent-diabetes mellitus and chronic hepatitis C virus infection. Hepatology. 1990;30;1059-63.
5. Kalaitzakis E, Rosengren A, Skommevik T Björnsson. ecoronary artery disease in patients with liver cirrhosis. Dig Dis Sci. 2010;55(2):467-75.
6. C Chantler, GB Haycock. Estimation of glomerular filtration rate from height/ plasma creatinine ratio. Arch Dis Child. 1983;58(9):754–55.
7. Fleming KM, Aithal GP, Solaymani-Dodaran M, Card TR, West J. Incidence and prevalence of cirrhosis in the United Kingdom, 1992-2001: a general populationbased study. J Hepatol. 2008;49(5):732-38.
8. Fasolato S, Angeli P, Dallagnese L, Maresio G, Zola E, Mazza E, et al. Renal failure and bacterial infections in patients with cirrhosis: epidemiology and clinical features. Hepatology. 2007;45:223-29.
9. Mc Hutchison JG, Manns MP, Longo DL. Definition and management of anemia in patients infected with hepatitis C virus. Liver Int. 2006;26:389–98.
10. David E Johnston. Special Considerations in Interpreting Liver Function Tests. Am Fam Physician. 1999;59(8):2223-30.
11. Fasolato S, Angeli P, Dallagnese L, Maresio G, Zola E, Mazza E, et al. Renal failure and bacterial infections in patients with cirrhosis: epidemiology and clinical features. Hepatology. 2007;45:223-29.
12. Das N, Bhattacharyya A, Paria B, Sarkar S. Study on assessment of renal function in chronic liver disease. Journal of Clinical and Diagnostic Research: JCDR. 2015 Mar;9(3):OC09.