International Journal of Research in Health and Allied Sciences

Journal home page: www.ijrhas.com

Official Publication of "Society for Scientific Research and Studies" [Regd.]

ISSN: 2455-7803

Original Research

Analysis of renal profile in liver cirrhosis patients: An observational study

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ABSTRACT:

Background: The present study was conducted for evaluating renal profile in liver cirrhosis patients.**Materials & methods:**100 patients with presence of cirrhosis of liver were enrolled. Complete demographic and clinical details of all the patients was obtained. Patients with presence of any pre-existing co-morbid condition or pathology were excluded from the present study. Clinical examination of all the patients was carried out. Complete medical examination was done of all the patients. This was followed by grading according to Child-Pugh score. All the patients were recalled in the morning and blood samples were obtained. All the samples were sent to laboratory where renal and biochemical profile was evaluated. **Results:** Deranged renal profile was seen in 30 percent of the patients. Mean blood urea and serum creatinine levels were found to be 37.6 mg/dL and 1.29 mg/dL respectively. Mean serum bilirubin level were found to be 2.45 mg/dL. Out of 30 patients of class A of Child Pugh score, 13.33 percent had deranged renal profile while 28.89 percent of the patients of class B of Child Pugh score had deranged renal profile. 52 percent of the patients of class C of Child Pugh score had deranged renal profile. Significant results were obtained while correlating serum renal profile with severity of cirrhosis of liver.**Conclusion:** Significant association was observed between severity of liver dysfunction and renal dysfunction. Hence; we should be more vigilant when treating patients with cirrhosis of liver, regarding their renal function, as adequate screening can decrease associated morbidity and mortality.

Key words: Cirrhosis, Renal, Liver

Received: 11 September, 2022 Accepted: 14 October, 2022

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This article may be cited as: Dhillon PS, Kaur A. Analysis of renal profile in liver cirrhosis patients: An observational study. Int J Res Health Allied Sci 2022; 8(6):81- 84.

INTRODUCTION

Morbidity and mortality from liver cirrhosis are rising worldwide. The diagnosis of cirrhosis is important to guide treatment, determine prognosis, and to monitor for complications in patients with chronic liver disease. The identification of cirrhosis is important for the prescribing of medicines, as its presence will alter the pharmacokinetics of some drugs.Regardless of the cause of liver disease, cirrhosis results from liver injury that leads to inflammation and fibrogenesis. It causes distortion of hepatic architecture, with micro- and macroscopic nodularity, leading to portal hypertension.Cirrhosis leaves patients vulnerable to life-threatening complications, including variceal bleeding, ascites, infection and hepatocellular carcinoma, and ultimately death.[1- 3]

Management of cirrhosis has changed considerably during the last decade. Progress in treatment of decompensations, such as gastrointestinal bleeding, hepatorenal syndrome, spontaneous bacterial peritonitis, and hepatocarcinoma, have led to significant improvements in survival. Thus, chance of surviving and becoming a liver transplant candidate has increased. Portal hypertension is the earliest and most important consequence of cirrhosis and underlies most of the clinical complications of the disease. Portal hypertension results from an increased intrahepatic resistance combined with increased portal (and hepatic arterial) blood flow. The fibrotic and angio-architectural modifications of liver tissue leading to increased intrahepatic resistance and the degree of portal hypertension seem to be highly correlated until HVPG values of 10-12 mmHg are reached.[4- 9]Pre-renal failure and hepatorenal syndrome (HRS) are the main causes of acute renal failure in cirrhosis. Both result from decreased renal blood flow and both can result in acute tubular necrosis. HRS is not always fully reversible with liver transplantation possibly due to underlying chronic kidney damage. A number of cirrhotic patients with acute renal failure may also have chronic kidney damage ("acute-on-chronic renal failure"); furthermore, cirrhotic patients

frequently have co-morbidities such as diabetes that may result in chronic impairment in renal function.[10] Hence; the present study was conducted for assessing incidence of renal dysfunction among patients with cirrhosis of liver.

MATERIALS & METHODS

The present study was conducted for assessing incidence of renal dysfunction among patients with cirrhosis of liver. 100 patients with presence of cirrhosis of liver were enrolled. Complete demographic and clinical details of all the patients was obtained. Patients with presence of any pre-existing co-morbid condition or pathology were excluded from the present study. Clinical examination of all the patients was carried out. Complete medical examination was done of all the patients. This was followed by grading according to Child-Pugh score. All the patients were recalled in the morning and blood samples were obtained. All the samples were sent to laboratory where renal and biochemical profile was evaluated. Assessment of all the results was done using SPSS software.

RESULTS

Analysis of 100 patients with presence of cirrhosis of liver was done. 60 percent of the patients belonged to the age group of more than 40 years with a mean age of 50.8 years. 72 percent of the patients were males.Deranged renal profile was seen in 30 percent of the patients.Mean blood urea and serum creatinine levels were found to be 37.6 mg/dL and 1.29 mg/dL respectively. Mean serum bilirubin level were found to be 2.45 mg/dL.Out of 30 patients of class A of Child Pugh score, 13.33 percent had deranged renal profile while 28.89 percent of the patients of class B of Child Pugh score had deranged renal profile. 52 percent of the patients of class C of Child Pugh score had deranged renal profile. Significant results were obtained while correlating serum renal profile with severity of cirrhosis of liver.

DISCUSSION

An acute deterioration in renal function in patients with chronic liver disease and also following liver transplantation is strongly associated with increased mortality. Acute kidney injury (AKI) is now defined in terms of an absolute or percentage increase in baseline serum creatinine, and the hepatorenal syndrome (HRS) uses creatinine both as a major inclusion criterion and also to subclassify patients into HRS Type 1, with a doubling of the serum creatinine to >2.5 mg/dL within 2 weeks, and Type 2, with slower deterioration in renal function. Although the mortality of patients with cirrhosis and HRS Type 1 remains high, newer treatments combining the vasopressin analogue terlipressin with daily albumin infusion have improved outcome.[11- 13]

In the present study, analysis of 100 patients with presence of cirrhosis of liver was done. Deranged renal profile was seen in 30 percent of the patients.Mean blood urea and serum creatinine levels were found to be 37.6 mg/dL and 1.29 mg/dL respectively. Mean serum bilirubin level were found to be 2.45 mg/dL.Out of 30 patients of class A of Child Pugh score, 13.33 percent had deranged renal profile while 28.89 percent of the patients of class B of Child Pugh score had deranged renal profile. The prevalence of renal dysfunction among liver cirrhosis was assessed in a previous study conducted by Choi Y et al. The medical records of cirrhotic patients who were admitted were reviewed retrospectively. The data obtained at first admission were collected. Acute kidney injury (AKI) and chronic kidney disease (CKD) were defined using the proposed diagnostic criteria of kidney dysfunction in cirrhosis.

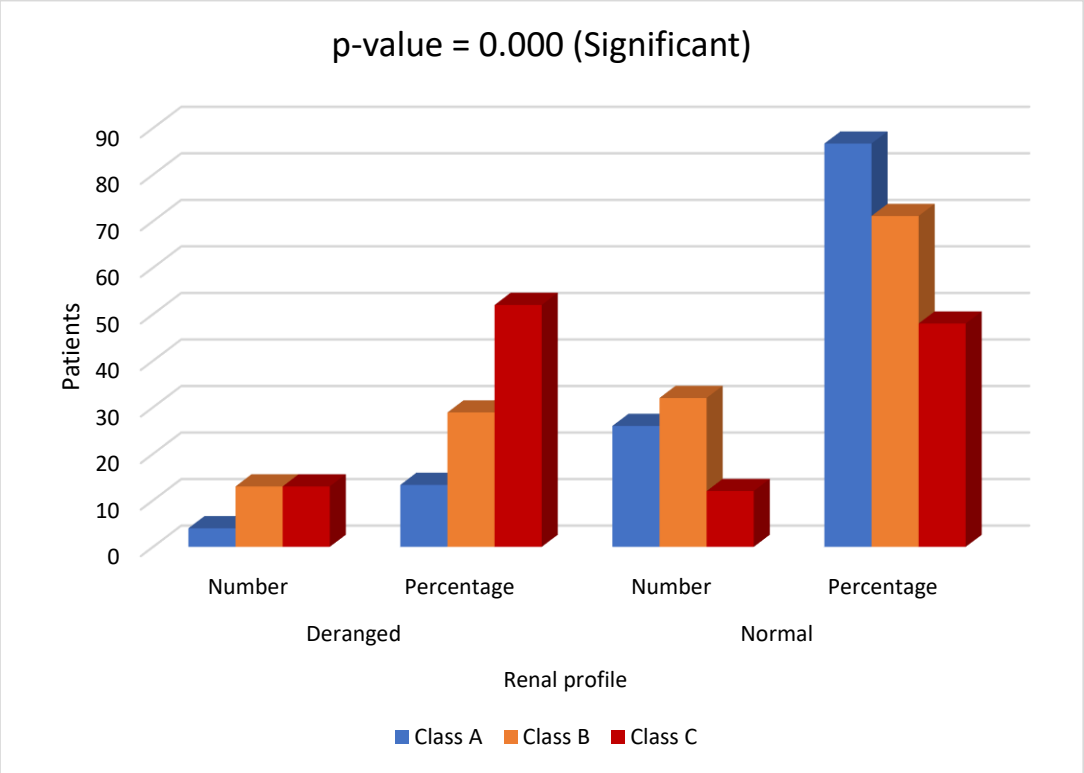
Table 1: Distribution of subjects according to Blood Urea and serum creatinine levels

Parameter		Frequency	Percentage
Blood urea	Normal	70	70
	Raised	30	30
	Total	100	100
Serum creatinine	Normal	70	70
	Raised	30	30
	Total	100	100

Table 2: Biochemical profile

Variable	Mean	SD
Random Blood Sugar (mg/dL)	118.2	33.5
Body Mass Index (Kg/m^2)	24.6	5.3
Blood Urea (mg/dL)	37.6	8.4
Serum Creatinine (mg/dL)	1.29	0.23
Serum Bilirubin (mg/dL)	2.45	0.89
SGOT (mg/dL)	112.6	39.2
SGPT (mg/dL)	113.9	39.8

Graph 1: Correlation of serum renal profile as assessed by abnormal serum creatinine and blood urea levels with severity of cirrhosis of liver



Six hundred and forty-three patients were admitted, of whom 190 (29.5%), 273 (42.5%), and 180 (28.0%) were Child-Pugh class A, B, and C, respectively. Eighty-three patients (12.9%) were diagnosed with AKI, the most common cause for which was dehydration (30 patients). Three patients had hepatorenal syndrome type 1 and 26 patients had prerenal-type AKI caused by volume deficiency after variceal bleeding. In addition, 22 patients (3.4%) were diagnosed with CKD, 1 patient with hepatorenal syndrome type 2, and 3 patients (0.5%) with AKI on CKD.Both AKI and CKD are common among hospitalized cirrhotic patients, and often occur simultaneously (16.8%).[14]

In the present study, 52 percent of the patients of class C of Child Pugh score had deranged renal profile. Significant results were obtained while correlating serum renal profile with severity of cirrhosis of liver. CKD in cirrhosis is associated with poor outcomes and an increased frequency of complications. Wong et al found that patients with cirrhosis with CKD had higher rates of superimposed AKI (68% vs 21%), need for dialysis (11% vs 2%) and 30-d mortality rates (16% vs 7%) than patients with cirrhosis without CKD. A 10 mL/min decrease in eGFR was found to be associated with a 13% increase in 30-d mortality in patients with cirrhosis. In a study by Bassegoda et al, patients with cirrhosis with CKD had a higher frequency of AKI (75% vs 45%), refractory ascites (25% vs 7%), bacterial infections (58% vs 34%) and LT requirement (25% vs 10%) compared with those without CKD. In addition, the involvement of cirrhosis is independently related to a poor outcome in patients with CKD. CKD impacts not only waitlist mortality but also worsens post-LT survival. Cullaro et al reported that the one-year post-LT mortality rate in patients with CKD was 12%, compared with 9% in those without CKD. In addition, posttransplant renal outcomes may also be affected by the presence of CKD.[15- 17] Thapa P et al, in another study, studied the profile of acute kidney injury in patients with liver cirrhosis.Out of 302 liver cirrhosis patients, 56 (18.5%) had acute kidney injury among which 23 (46%) were found to have pre-renal acute kidney injury, 15 (30%) with hepatorenal syndrome-acute kidney injury and 12 (24%) with intrinsic renal disease. Patients with higher stages of acute kidney injury had longer duration of hospital stay and hepatorenal syndrome-acute kidney injury was seen in patients with higher grade of ascites and with hyponatremia.Acute kidney injury is a common occurrence in patients with advanced liver cirrhosis with pre-renal acute kidney injury being the commonest cause.[18]

CONCLUSION

Significant association was observed between severity of liver dysfunction and renal dysfunction. Hence; we should be more vigilant when treating patients with cirrhosis of liver, regarding their renal function, as adequate screening can decrease associated morbidity and mortality.

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