

Original Research

Evaluation of renal profile in liver cirrhosis patients

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ABSTRACT:

Background: Cirrhosis is characterized by fibrosis and nodule formation of the liver, secondary to a chronic injury, which leads to alteration of the normal lobular organization of the liver. Accurate evaluation of the renal function is potentially crucial in liver cirrhosis patients. Hence; the present study was planned for assessing the renal profile in liver cirrhosis patients. **Materials & methods:** A total of 50 subjects with presence of cirrhosis of liver were enrolled in the present study. For assessment of kidney function serum urea, creatinine, serum sodium and potassium were examined. Severity of liver cirrhosis was assessed in terms of Child Pugh Score. According to this score, patients were graded into Grade A, B and C with A grade indicating minimal severity and C grade indicating maximum severity. All the results were recorded and analyzed by SPSS software. **Results:** According to Child Pugh Score grading, 36 percent, 38 percent and 26 percent of the patients were of Grade A, grade B and Grade C respectively. Altered renal profile was seen in 18 percent of the patients. Significant results were obtained while correlating severity of liver cirrhosis and renal dysfunction. **Conclusion:** Significant association exists between severity of liver dysfunction and renal dysfunction.

Key words: Renal profile, Cirrhosis

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INTRODUCTION

Cirrhosis is characterized by fibrosis and nodule formation of the liver, secondary to a chronic injury, which leads to alteration of the normal lobular organization of the liver. Various insults can injure the liver, including viral infections, toxins, hereditary conditions, or autoimmune processes. With each injury, the liver forms scar tissue (fibrosis), initially without losing its function. After a long-standing injury, most of the liver tissue gets fibrosed, leading to loss of function and the development of cirrhosis. Chronic liver diseases usually progress to cirrhosis.¹⁻³ Patients with cirrhosis can be asymptomatic or symptomatic, depending on whether their cirrhosis is clinically compensated or decompensated. In compensated cirrhosis, patients are usually asymptomatic, and their disease is detected incidentally by labs, physical exams, or imaging. On the other hand, patients with decompensated cirrhosis usually present with a wide range of signs and symptoms arising from a combination of liver

dysfunction and portal hypertension.⁴⁻⁶ Accurate evaluation of the renal function is potentially crucial in liver cirrhosis patients. Indeed, it can lead to early diagnosis of both acute kidney injury and chronic kidney disease and to reliable characterization of the renal status of the patient before performing a liver transplantation. Despite some limitations, the assay of serum creatinine (SCr) is universally used to estimate glomerular filtration rate (GFR) because of its wide availability, its simplicity and because it is inexpensive.⁶⁻⁸ Hence; the present study was planned for assessing the renal profile in liver cirrhosis patients.

MATERIALS & METHODS

The present study was planned for assessing the renal profile in liver cirrhosis patients. A total of 50 subjects with presence of cirrhosis of liver were enrolled in the present study. Unconscious patients, known patients of kidney disease and patients taking any nephrotoxic drugs and patients of chronic diseases

such as tuberculosis, malignancy, and diabetes mellitus were excluded from the study. Complete demographic and clinical details of all the subjects were obtained. The patients were examined for presence of ascitis, hepato-splenomegaly, distended veins, everted umbilicus etc. to assess the severity of liver dysfunction. Biochemical examination was done. For assessment of kidney function serum urea, creatinine, serum sodium and potassium were examined. Severity of liver cirrhosis was assessed in terms of Child Pugh Score. According to this score, patients were graded into Grade A, B and C with A grade indicating minimal severity and C grade indicating maximum severity. All the results were recorded and analyzed by SPSS software.

RESULTS

In the present study, a total of 50 patients with cirrhosis of liver were enrolled. Mean age of the patients was 46.8 years. Out of 50 patients, 34 were males and 16 were females. According to Child Pugh Score grading, 36 percent, 38 percent and 26 percent of the patients were of Grade A, grade B and Grade C respectively. Altered renal profile was seen in 18 percent of the patients. Significant results were obtained while correlating severity of liver cirrhosis and renal dysfunction.

Table 1: Distribution of patients according to Child-Pugh Score grading

Child-Pugh Score grading	Frequency	Percentage
Grade A	18	36
Grade B	19	38
Grade C	13	26

Table 2: Distribution of subjects according to renal dysfunction

Renal dysfunction	profile	Frequency	Percentage
Blood urea	Normal	41	82
	Raised	9	18
Serum creatinine	Normal	41	82
	Raised	9	18

DISCUSSION

In liver cirrhosis patients, it is prognostically equally important to assess the renal function before and after transplantation. Most of the causes of renal failure in liver cirrhosis are functional, the acute kidney damage including prerenal azotemia, acute tubular necrosis and hepatorenal syndrome. A major index of the renal function, the glomerular filtration rate (GFR) is

determined in a specific way in patients with liver cirrhosis. Clinically, serum creatinine is considered the best indicator of kidney function, although it is rather unreliable when it comes to early assessment of renal dysfunction. Most of the patients with liver cirrhosis have several concomitant conditions, which are the reason for the false low creatinine levels, even in the presence of moderate to severe kidney damage.⁸⁻¹⁰ Hence; the present study was planned for assessing the renal profile in liver cirrhosis patients.

In the present study, a total of 50 patients with cirrhosis of liver were enrolled. Mean age of the patients was 46.8 years. Out of 50 patients, 34 were males and 16 were females. According to Child Pugh Score grading, 36 percent, 38 percent and 26 percent of the patients were of Grade A, grade B and Grade C respectively. Yoo JJ et al compared the performance of 2 common eGFR measurements with mGFR and evaluated the impact of low muscle mass on overestimation of renal function in patients with cirrhosis. Their study included 779 consecutive cirrhotic patients who underwent 51Cr-ethylenediamine tetra acetic acid (EDTA) (as a mGFR) and abdominal computed tomography (CT). The eGFR was calculated using creatinine or cystatin C. Modification of diet in renal disease (MDRD)-eGFR was overestimated in 47% of patients. A multivariate analysis showed that female sex (adjusted odds ratio [aOR] 4.91), Child B and C vs. A (aOR 1.69 and 1.84) and skeletal muscle mass (aOR 0.89) were independent risk factors associated with overestimation. Interestingly, the effect of skeletal muscle mass on overestimation varied based on sex. Decreased muscle mass significantly enhanced the risk of overestimation of MDRD-eGFR in male patients, but not in female patients. The risk factors associated with overestimation included female sex, impaired liver function, and decreased muscle mass in males.¹⁰

In the present study, altered renal profile was seen in 18 percent of the patients. Significant results were obtained while correlating severity of liver cirrhosis and renal dysfunction. Das N et al assess the renal function in chronic liver diseases and find out the association of alteration of renal function with gradation of liver disease as assessed by child-pugh criteria. 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.

Table 3: Correlation of severity of liver cirrhosis and renal dysfunction

Child-Pugh Score grading	Blood urea levels		p- value	Serum creatinine levels		p- value
	Normal	Raised		Normal	Raised	
Grade A	16	2	0.00 (Significant)	16	2	0.00 (Significant)
Grade B	13	6		13	6	
Grade C	4	9		4	9	

The distribution of serum urea and creatinine across the categories of Child Pugh classification tested by Mann-Whitney test and the distribution was statistically significant.¹¹ Recently, Kuster et al showed that comparing with an enzymatic assay, even a compensated Jaffe assay accounted for an average decrease of 6.14 $\mu\text{mol/L}$ of the SCr in cirrhotic patients. This resulted in a median overestimation of GFR estimated by CKD-EPI formula and a reduced MELD score in patients with SCr > 1 mg/dL. Finally, it is known that there is a significant secretion of creatinine by the tubule in patients with decreased renal function, which increases when the CKD becomes more severe.¹²⁻¹⁴

CONCLUSION

From the above results, the authors conclude that significant association exists between severity of liver dysfunction and renal dysfunction.

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