ORIGINAL RESEARCH

Analysis of renal profile in patients with liver disease: An observational study

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Abstract

Background: The present study was conducted for analyzing renal profile in patients with liver disease.

Materials & methods: A total of 100 patients were enrolled. Detailed history and clinical examination were done. Relevant blood investigation like Hemogram, peripheral blood smear for band forms, Urine analysis under microscopy and routine, protein, Blood urea and serum creatinine at admission was done. Serum electrolytes, Ultrasonography abdomen, ABG if required, Central venous pressure and other investigations to exclude diseases causing liver and renal failure was performed on day of admission and patient was follow up every month till 6 months. Data was collected according to a predefined protocol (proforma). Demographic characteristics, risk factors, family history, neurological examination, diagnostic data and treatment details was collected.

Results: Mean blood urea levels and serum creatinine levels were found to be 41.87 mg/dL and 1.39 mg/dL respectively. Out of 100 patients, 3 percent of the patients belonged to Child Pugh score A while 51 percent of the patients and 46 percent of the patients (46 patients) belonged to Child Pugh score B and Child Pugh score C respectively. Abnormal serum urea levels and serum creatinine levels were seen in 31 percent of the patients each. Mean serum creatinine levels at Day 1 and Day 3 were 1.25 mg/dL and 1.58 mg/dL respectively.

Conclusion: Patients with liver diseases have significant deranged renal profile.

Key words: Renal Profile, Liver disease

Introduction

Hepatic disorders like hepatitis B and hepatitis C, alcoholic liver disease as well as cirrhosis, hepatic insufficiency along with hepatocellular carcinoma are frequent etiologies of morbidity as well as mortality. [1, 2] The frequently occurring diseases leading to hepatic disorders India are dengue fever, malaria, etc as well as scrub typhus. Despite improvements in sewage management as well as sanitary standards, hepatitis E remains the leading etiology in India. Hepatic venous outflow tract obstruction is an uncommon disorder in both India as well as Western nations, although there are differences between the risk variables as well as trends of venous obstruction in the two. A patient not having cirrhosis or any pre-existent liver disease experiences acute hepatic injury, hepatic encephalopathy, reduced synthetic function. Acute renal injury can be due to hepatorenal syndrome, that can occur in people with acute or chronic liver illness.[3, 4] Hepatorenal syndrome (HRS) affects about four percent patients with decompensated liver failure. The majority of these individuals have portal hypertension brought on by metastatic malignancies, cirrhosis, or alcoholic hepatitis. In individuals with decompensated liver disease, cumulative likelihood of developing HRS at one year is eighteen percent, and at five years, it is thirty nine percent. Patients having hyponatremia and high plasma renin activity posed the greatest risk. A third of people who experience spontaneous bacterial peritonitis may later develop HRS.[5- 7]So; current study was taken up to evaluate renal dysfunction in patients having liver disease.

Materials & methods

The present study was conducted for analyzing renal profile in patients with liver disease. Inclusion criteria

for the present study included patients aged more than 18 years with clinical biochemical or ultrasonographic features of liver disease. A total of 100 patients were enrolled. Detailed history and clinical examination were done.Relevant blood investigation like Hemogram, peripheral blood smear for band forms, Urine analysis under microscopy and routine, protein, Blood urea and serum creatinine at admission was done. Serum electrolytes, Ultrasonography abdomen, ABG if required, Central venous pressure and other investigations to exclude diseases causing liver and renal failure was performed on day of admission and patient was follow up every month till 6 months. Data was collected according to a predefined protocol (proforma). Demographic characteristics, risk factors, family history, neurological examination, diagnostic data and treatment details was collected. Data was entered in Windows MS Excel. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS Software. P-value of less than 0.05 was taken as significant.

Results

Mean age of the patients was 55.8 years.88 percent of the (88 patients) were males while the remaining were females. Alcohol was the main etiologic factor found to be present in 78 percent of the patients while viral etiology of cirrhosis of liver was found to be present in 10 percent of the patients (10 patients).Mean blood urea levels and serum creatinine levels were found to be 41.87 mg/dL and 1.39 mg/dL respectively. Out of 100 patients, 3 percent of the patients belonged to Child Pugh score A while 51 percent of the patients and 46 percent of the patients (46 patients) belonged to Child Pugh score B and Child Pugh score C respectively. Abnormal serum urea levels and serum creatinine levels were seen in 31 percent of the patients each. Mean serum creatinine levels at Day 1 and Day 3 were 1.25 mg/dL and 1.58 mg/dL respectively.

Table 1: Etiologic profile

Etiologic profile	Number of patients	Percentage
Alcohol	78	78
Viral	10	10
Autoimmune	8	8
Others	4	4
Total	100	100

Table 2: Renal profile

Renal profile	Mean	SD
Blood urea (mg/dL)	41.87	30.12
Serum creatinine (mg/dL)	1.39	0.89

Table 3: Distribution of patients according to Child Pugh score

Child Pugh score	Number of patients	Percentage
A	3	3
B	51	51
C	46	46
Total	100	100

Table 4: Distribution of patients according to deranged profile

Renal profile		Number of patients	Percentage
Serum urea	Normal	69	69
	Abnormal	31	31
Serum creatinine	Normal	69	69
	Abnormal	31	31

Table 5: Serum creatinine levels at different time intervals

Serum creatinine (mg/dL)	Mean	SD
Day 1	1.25	0.51
Day 3	1.58	0.88

Discussion

The process leading to liver cirrhosis is complex and involves modifications of systemic arterial circulation, vasoconstrictors activation, and suppression of vasodilatory factors affecting renal circulation.The subjects with advancing liver disease and due to

disturbance in circulatory function, such as decreased systemic vascular resistance, are more prone to development of prerenal failure. The arterial vasodilatation is because of increase in formation of vasodilator factors. Clinical features of true hypovolemia:- gastrointestinal tract bleeding from varices, peptic ulcers, vomiting etc. The main feature for renal impairment is by high volume paracentesis without intravascular volume replacement. The pre-renal failure can be due to NSAIDs and bacterial infections. Septic shock can also lead to impaired kidney function.[8- 10] Hence; the present study was conducted for analyzing renal profile in patients with liver disease. In the present study, mean age of the patients was 55.8 years. 88 percent of the (88 patients) were males while the remaining were females. Alcohol was the main etiologic factor found to be present in 78 percent of the patients while viral etiology of cirrhosis of liver was found to be present in 10 percent of the patients (10 patients). Mean blood urea levels and serum creatinine levels were found to be 41.87 mg/dL and 1.39 mg/dL respectively. Patients with ALD and AKI who had less than six months of sobriety, Lenhart Aet alevaluated the results of renal replacement therapy. A retrospective review of hospitalised patients having acute or chronic alcoholic cirrhosis, acute tubular necrosis, or alcoholic hepatitis was conducted. There were forty-seven patients total, and 21.3% of them remained sober for at least 6 months to qualify for transplant evaluation. Mortality was 78.7% despite renal replacement therapy. Four of the survivors received transplants, and six made a full recovery without one. There was negligible difference in renal recovery or survival between kidney injury etiologies. When compared to continuous kidney replacement therapy, the initial dialysis modality of intermediate haemodialysis predicted improved survival and almost reached significance for renal recovery. When weighing the pros and cons of starting dialysis, these outcomes should be taken into account.[11] In the present study, out of 100 patients, 3 percent of the patients belonged to Child Pugh score A while 51 percent of the patients and 46 percent of the patients (46 patients) belonged to Child Pugh score B and Child Pugh score C respectively. Abnormal serum urea levels and serum creatinine levels were seen in 31 percent of the patients each. Mean serum creatinine levels at Day 1 and Day 3 was 1.25 mg/dL and 1.58 mg/dL respectively.Wetarini K et al discussed the underlying pathophysiology of HRS and demonstrated diagnostic approach to identify most suitable therapeutic approaches in clinical practise. One of the main potential causes of AKI in patients with decompensated liver disease is the HRS. Hepatorenal syndrome is clinically classified into two types, type one and type two. Best treatment for HRS patients is liver transplantation, but due to the high mortality rate, few people choose to have it done. Pharmacology and non-pharmacology approaches are additional treatment modalities for hepatorenal syndrome. Optimizing and stabilising the patient until an organ transplant is present is the goal of HRS management.[12]The effectiveness of kidney Duplex ultrasonography in early detection and prognosis of HRS was examined by Mogawer MSet al. 50 patients participated in this study. HRS was associated positively with Model for End-Stage Liver Disease score and negatively with the renal artery hilum resistivity index. With a cut-off value > zero point seventy seven, the renal artery hilum resistivity index can be used to predict hepatorenal syndrome with one hundred percent sensitivity and sixty six point seven percent specificity. Hepatorenal syndrome may be accurately predicted by the renal resistive index.[13]

Conclusion

From the above results, the authors conclude that patients with liver diseases have significant deranged renal profile.

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