

# FREQUENCY OF HEPATORENAL SYNDROME IN PATIENTS WITH LIVER CIRRHOSIS

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## ABSTRACT

**Objective:** To determine the frequency of hepatorenal syndrome in patients with liver cirrhosis.

**Design:** A cross-sectional study.

**Place and Duration of Study:** From April 2012 to December 2012 at Department of Medicine, Govt: Lady Reading Hospital Peshawar.

**Patients and Methods:** A total of 196 patients admitted to the Medical unit, Govt: Lady Reading Hospital Peshawar, were included in this study after fulfilling the inclusion criteria. All the patients were diagnosed as having liver cirrhosis. Renal dysfunction was identified in these patients and these patients were worked up for the presence of hepatorenal syndrome.

**Results:** Out of one hundred and ninety six (196) patients, 105 (53.6%) were males and 91 (46.4%) were females. Thirty nine (39) patients were diagnosed as having hepatorenal syndrome based on the diagnostic criteria. Out of 39 patients, 22 (56.4%) were females and 17 (43.6%) were males. Mean age of patients having hepatorenal syndrome was 55.64 years. The frequency of hepatorenal syndrome was 19.9% in patients with liver cirrhosis.

**Conclusion:** Hepatorenal syndrome is a common complication of cirrhosis liver. Data collected through this study showed that hepatorenal syndrome is a major cause of renal impairment in patients with liver cirrhosis.

**Key words:** Hepatorenal syndrome, Cirrhosis liver

## INTRODUCTION

Cirrhosis is the final stage of chronic liver disease. It is characterized by fibrosis and formation of abnormal regenerative nodules surrounded by fibrous tissue affecting the whole liver and the changes are usually irreversible. Liver cirrhosis can be divided into compensated and decompensated. In decompensated liver cirrhosis there will be portal hypertension, ascites, variceal bleeding, encephalopathy and jaundice.<sup>1,2</sup>

Ascites often develop in patients with liver cirrhosis and it is usually accompanied by renal dysfunction. Patients with ascites are at increased risk for the development of other complications like hepatorenal syndrome, encephalopathy and spontaneous bacterial peritonitis.<sup>1</sup>

Hepatorenal syndrome (HRS) is the development of renal failure in patients with liver cirrhosis. It is a life threatening condition with poor prognosis.<sup>3</sup>

Hepatorenal syndrome is a reversible functional renal impairment that is characterized by marked reduction in glomerular filtration rate and renal plasma flow in the absence of other causes of renal failure.<sup>1,5</sup> In

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hepatorenal syndrome there is renal vasoconstriction with vasodilatation in systemic and splanchnic circulation. There is no proteinuria and tubular function is usually preserved.<sup>5,6</sup> The histological appearance of the kidney is normal and the kidneys often resumes normal function following liver transplantation.<sup>1,3,6</sup>

Hepatorenal syndrome can be divided into two types. Type 1 is rapidly progressive whereas type 2 is characterized by milder course with a longer median survival.<sup>6,7</sup>

In liver cirrhosis other causes of renal failure other than hepatorenal syndrome, are prerenal failure secondary to hypovolemia, acute tubular necrosis and drug induced nephrotoxicity (e.g. aminoglycosides, antibiotics, non steroidal anti inflammatory and antiviral therapy).<sup>3,4</sup>

At least 40% of patients with cirrhosis will develop hepatorenal syndrome during the natural history of the disease. In less than 5% of cases, it is spontaneously reversible. Hepatorenal syndrome is involved in more than 50% of cirrhosis related mortality.<sup>8</sup>

As Hepatorenal syndrome is a frequent and common complication of liver cirrhosis, this study shall give a useful insight about the frequency of HRS in our population.

## PATIENTS AND METHODS

This study was carried out in the department of

medicine Govt: Lady Reading Hospital Peshawar from April 2012 to December 20120. It was a cross sectional study.

Informed written consent was taken from all the patients. Detailed history was taken regarding decreased urinary output, use of nephrotoxic drugs diuretics, fever, diahorrea, vomiting, urgency, nocturia and urinary obstruction. Patients who have history of nephrotoxic drugs usage or having diahorrea or vomiting were excluded from the study. Detailed physical examination was carried out regarding pulse, blood pressure, temperature, signs of dehydration and signs of chronic liver disease.

Patients presenting with features of shock and septicemia were excluded from the study. Rest of the patients underwent ultrasonography for confirmation of liver cirrhosis and renal disease. Patients with small and echogenic kidneys and obstructive uropathy were excluded from the study. Serum creatinine, blood urea, 24 hours urinary protein, urinary volume and creatinine clearance were estimated. Patients who had serum creatinine of more than 1.5mg/dl were given 1.5 liters of normal saline after stopping diuretics. Their serum creatinine was remeasured and if it was above 1.5mg/dl, they were diagnosed as having hepatorenal syndrome.

The diagnosis of hepatorenal syndrome was based on criteria proposed by International Ascities Club in 1996.

The following is the diagnostic criteria.

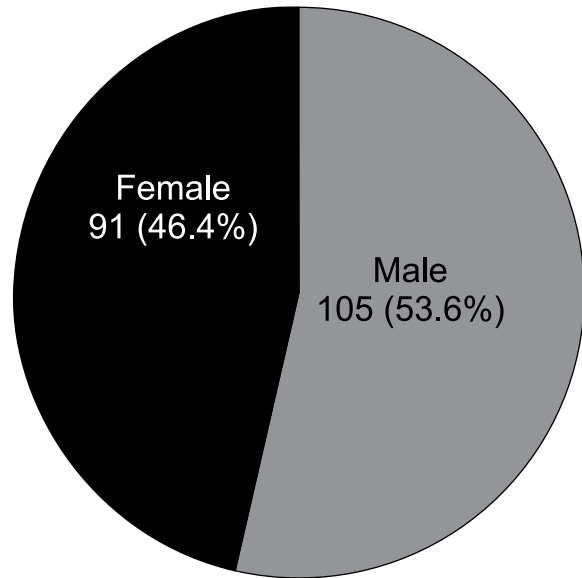
- Chronic liver disease with liver failure.
- Low glomerular filtration rate with serum creatinine more than 1.5mg/dl and creatinine clearance less than 40ml/min.
- No sustained improvement in renal function following diuretic withdrawal and expansion of plasma with 1.5 liters of normal saline.

The data was analyzed by using SPSS version 10.0. Male to female ratio was calculated. Means of variables were calculated. Frequency and percentage was calculated for hepatorenal syndrome.

## RESULTS

A total of one hundred and ninety six (196) patients with liver cirrhosis were included in the study. Out of 196 patients, 105 (53.6%) were males and 91(46.4%) were females with a male to female ratio of 1.15:1(Graph)

On the basis of investigations, 157(80.1%) patients with liver cirrhosis were not found to have hepatorenal syndromre as their serum creatinine was less than 1.5 mg/dl after giving 1.5 liters of normal saline. In the remaining 39(19.9%)s patients, the diagnosis of hepatorenal syndrome was made as their serum



Male to Female ratio = 1.15: 1 Sex-Wise Distribution Of Patients (n=196)

creatinine was more than 1.5 mg/dl. The frequency of hepatorenal syndrome in patients with liver cirrhosis was 19.9%

In the 39 patients having hepatorenal syndrome, twenty two (56.4%) were females and 17(43.6%) were males. In this study out of 39 patients, most of the patients (30.8%) was in the age range of 41-50 and 51-60 years respectively with a mean age of 55.64 years (Table)

## DISCUSSION

Millions of people are affected by liver diseases worldwide. However, in the developing countries where cost of health care has always been an issue, chronic diseases such as liver cirrhosis and its complications are always a big challenge to the economy.<sup>9</sup>

Cirrhosis liver is very common in our community because of very high prevalence of hepatitis B and C infection. As a result, increasing number of patients land up with liver cirrhosis and its complications.<sup>9,10</sup>

Worldwide cirrhosis liver related mortality and morbidity is very high and in countries like Pakistan, it is one of the leading cause of death<sup>11</sup> and frequent cause of admission in our hospitals. Over a period of 5-30 years, 10-20% of patients with chronic liver disease will develop cirrhosis liver.

In Pakistan, the most common cause of cirrhosis liver is viral hepatitis as compared to West where alcohol is more common.<sup>12</sup> Majority of patients with chronic liver disease have evidence of hepatitis B, hepatitis C or co-infection. Disease is usually more severe in patients with co-infection and cirrhosis is recorded in 74% of patients.<sup>13,14</sup>

**Table. Cross Tabulation of Sex and Age-Ranges of Patients with Hepatorenal Syndrome (n=39)**

SEX	AGE RANGES (IN YEARS)						Total
	31-40	41-50	51-60	61-70	71-80	81-90	
Male	02	02	05	05	01	02	17
Female	02	10	07	03	-	-	22
Total	04	12	12	08	01	02	39

Hepatorenal syndrome is a major complication of end stage liver disease. It is characterized by functional renal failure and severe alteration in the systemic circulation. It carries a poor prognosis without liver transplantation.<sup>15,16</sup>

Hepatorenal syndrome is a progressive renal dysfunction associated with advanced cirrhosis and may occur in up to 40% of patients with liver cirrhosis.<sup>17</sup>In this study hepatorenal syndrome was a major cause of renal failure. The diagnosis of hepatorenal syndrome should only be made when other causes of renal impairment are ruled out. In a study in America, almost 40% of patients with liver cirrhosis were wrongly diagnosed as having hepatorenal syndrome because at that time the diagnostic criteria was not developed. Other important causes of renal impairment are spontaneous bacterial peritonitis, renal disease secondary to analgesic usage, hypovolemia and primary renal disease.<sup>1</sup>

In a local study conducted at Karachi, hepatorenal syndrome was found in 15% of patients with cirrhosis liver.<sup>1</sup>In an another local study hepatorenal syndrome was found in 09% of patients.<sup>18</sup> Another study reported a prevalence of 18% in cirrhotic patients.<sup>19</sup> Whereas in this study, hepatorenal syndrome was found in 19.9% of patients.

In various international studies the prevalence of hepatorenal syndrome is reported to be between 30 to 51.8%.<sup>20,21,22</sup>

Incidence of hepatorenal syndrome is equal in both sexes. However in a local study, out of 36 patients, 22(61.1%) were males and 14(38.9%) were females.<sup>1</sup> Male predominance was also reported in various international studies.<sup>23,24</sup> In this study out of 39 patient,17(43.6%) were male and 22(56.4%) were females.

Mean age of patients having hepatorenal syndrome was 55.64 years. Similar mean age (53.09%) was recorded in a local study.<sup>18</sup> Various International studies also reported similar mean age.<sup>25,26</sup>

In contrast to all above mentioned studies, our results showed that among the 39 patients with hepatorenal syndrome, most of the patients were females. Female dominance in our study having hepatorenal syndrome may be because of late referral, lack of awareness, poverty, and above all low literacy rate in female.

Once the diagnosis of hepatorenal syndromes is made, the patients should be treated promptly both with pharmacological and surgical intervention. Liver transplantation remains the best treatment for suitable candidates with hepatorenal syndrome because it offers a cure to both the diseased liver and the renal dysfunction.<sup>1</sup>

## CONCLUSION

Hepatorenal syndrome is a common complication of liver cirrhosis. Data collected through this study showed that hepatorenal syndrome is a frequent and common cause of renal failure in patients with liver cirrhosis. Local data about the prevalence of this condition is scarce and further work is needed.

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