DOI: https://doi.org/10.53350/pjmhs22168410

ORIGINAL ARTICLE

Frequency and Outcomes of Hepatorenal Syndrome in Patients with Chronic Liver Disease

SARWAR KHAN[1], KAPEEL RAJA[2], MUZZAMIL RIAZ MALIK[3], SOHAIL HUSSAIN[4], KHALIL UR REHMAN[5], HIRA TAHIR[6]
[1]*MBBS, FCPS, (Gastroenterology), THQ Hospital Dargai Malakand*
[2]*Associate Professor Department of Gastroenterology, Hepatology & Nutrition, Pir Abdul Qadir Shah Jilani Institute Of Medical Science Gambat Khairpur, Sindh Pakistan (Formerly known as Gambat institute of Medical Science Gambat)*
[3]*Assistant Professor Department of Nephrology Sargodha Medical College Sargodha, Punjab*
[4]*Assistant Professor, Consultant Gastroenterologist and Hepatologist, Clinical Cordinator for Postgraduate studies, Ziauddin University Karachi*
[5]*House Officer, Deptt of Internal Medicine, Bolan Medical Complex Quetta*
[6]*Medical Graduate, Sheikh Zayed Medical college, Rahim yar khan*
Corresponding author: Muzzamil Riaz Malik, Email : dr.muzzamil@gmail.com

ABSTRACT

Objective: To determine the frequency of hepatorenal syndrome in patients presented with chronic liver disease, also examine one month mortality in patients diagnosed with hepatorenal syndrome.

Study Design: Prospective/Observation Study

Place and Duration: Medical Ward, THQ Hospital Dargai Malakand and Ziauddin University Karachi, From November, 2021 to April, 2022.

Methodology: One hundred and five patients of either gender presented with chronic liver disease having ages 18 to 65 years were enrolled. Detailed demographics including age, sex, BMI, duration of disease and etiology of liver cirrhosis were recorded after taking informed written consent. Patients with hepatic encephalopathy being treated with nephrotoxic drugs, acute infection, hypovolemia, sepsis, and fulminant and sub-fulminant hepatic failure were excluded. Serum creatinine was analyzed in all the patients to examine renal failure. Outcomes in term of one month mortality was also examined in HRS patients. Data was analyzed by SPSS 24.0.

Results: There were 63 (60%) males while 42 (40%) patients were females with mean age 47.18±11.64 years. Mean BMI was 24.66±3.84 kg/m^2. Among 105 patients 15 (14.29%) patients were diagnosed to have hepatorenal syndrome. Out of 15 HRS patients, 4 (26.67%) were died.

Conclusion: It is concluded that frequency of hepatorenal syndrome in liver cirrhosis patients was high. And HRS was associated with high rate of mortality.

Keywords: Chronic Liver Disease, HBV, HCV, Hepatorenal Syndrome, Mortality

INTRODUCTION

Cirrhosis, which is the last stage of hepatocellular injury, can lead to malfunction and even failure of the liver. The condition known as cirrhosis of the liver worsens with time. This degenerative illness, for which there is now no treatment, is characterised by the development of fibrosis and nodular regrowth. This illness is currently the top cause of death around the globe [1]. Despite the fact that hepatitis B and C are responsible for roughly 65 percent of cirrhosis cases in Pakistan, it is simple to avoid contracting any of these viruses by participating in routine community health care [2]. A sizeable percentage of Pakistan's people suffer from the liver disease cirrhosis.

Cirrhosis is linked to a high mortality rate, which may be explained by the numerous life-threatening consequences that can develop as a result of the condition. Diseases such as hepatic encephalopathy, gastrointestinal haemorrhage, hepatopulmonary syndrome, and hepatoreticular syndrome are included in this group. Hepatorenal syndrome (HRS) [3, 4] is a disorder in which patients who have liver failure (acute or chronic) also have a steady decline in their kidney function over time. Patients who have this condition are considered to have hepatorenal syndrome.

Researchers Anand and colleagues [4] discovered that therapy with nonsteroidal anti-inflammatory drugs led to a reduction in renal blood flow as well as the glomerular filtration rate in cirrhotic patients who had ascites (GFR). Additional research conducted over the subsequent two decades confirmed that renal failure was brought on by a combination of renal circulation vasoconstriction and severe systemic arteriolar vasodilatation. [Citation needed] [Citation needed] [Citation needed] [Citation needed] Because of the interaction between these two systems, there was a reduction in the systemic vascular resistance, which led to a drop in blood pressure [5].

In accordance with the degree of impairment it causes, hepatorenal syndrome can be divided into types 1 and 2. A characteristic feature of type 2 HRS, which results in modest renal impairment, is ascites that is unresponsive to treatment with diuretics. Patients who have type 2 HRS have initial blood creatinine levels that are lower than 2.5 mg/dL7, which is indicative of having 50 percent renal function. Patients diagnosed with type 2 HRS have a median survival time of six months [6-7], and the progression of the disease is gradual and consistent. It has been connected to the progression of cirrhosis. The transition from Type 2 to Type 1 HRS is characterised by a rapid loss in acute renal function and an inability to maintain adequate perfusion of the kidneys [8-9]. People who have type 1 diabetes typically have a glomerular filtration rate (GFR) that is lower than 20 mL/min and a rapid rise in blood creatinine levels (more than 2.5 mg/dL in 2 weeks). The disease is associated with a high death rate; the usual amount of time someone lives after receiving a diagnosis is just 8-12 weeks8, and the probability of survival beyond 30 days reduces to 25% [10, 11].

At least forty percent of people who have cirrhosis will develop hepatorenal syndrome at some point over the course of the disease. In fewer than 5% of instances, it can be undone by itself on its own. Hepatorenal syndrome is responsible for more than half of all deaths that are associated with cirrhosis [12].

This study was carried out to determine the frequency of occurrence of hepatorenal syndrome (HRS) in patients with chronic liver disease as well as the short-term repercussions that accompany its presence.

MATERIALS AND METHODS

This prospective/observational study was conducted at Medical Ward, THQ Hospital Dargai Malakand and Ziauddin University Karachi, during from the period November, 2021 to April, 2022. Total 105 patients of either gender presented with chronic liver disease having ages 18 to 65 years were enrolled. After receiving the participants' given written consent, detailed demographic information was gathered. This information included the participants' ages, genders, body mass indexes, duration of disease, and the causes of liver cirrhosis. Patients who had hepatic encephalopathy and were receiving treatment with nephrotoxic medicines were not eligible for the study. Neither were

patients who had acute infections, hypovolemia, sepsis, or fulminant or subfulminant hepatic failure.

Estimates were made of creatinine in the serum, urea in the blood, urine protein after 24 hours, urinary volume, and creatinine clearance. After discontinuing the use of diuretics, patients who had a blood creatinine level that was greater than 1.5 mg/dl were each given 1.5 litres of normal saline. After having their serum creatinine remeasured, the patient was given a diagnosis of hepatorenal syndrome if it was found to be greater than 1.5 mg/dl. Criteria developed by the International Ascities Club in 1996 formed the basis for the diagnosis of hepatorenal syndrome.

SPSS 24.0 was used to perform the analysis on all of the data. It was determined what the male to female ratio should be. The variables' means and standard deviations were computed. We determined the frequency of hepatorenal syndrome and performed a percentage calculation on its severity.

RESULTS

Out of 105 patients, 63 (60%) were males while 42 (40%) patients were females with mean age 47.18±11.64 years. Mean BMI was 24.66±3.84 kg/m^2. According to etiology 40 (38.10%) patients had hepatitis B, 54 (51.43%) patients had hepatitis C and 9 (8.57%) patients had hepatitis B, C both. Duration of disease was 5.46±3.82 years. (Table 1)

Table 1: Baseline details of all the included patients

Characteristics	Frequency No.	%age
Mean age (years)	47.18±11.64	-
Mean BMI (kg/m)	24.66±3.84	-
Duration of Disease (years)	5.46±3.82	-
Gender		
Male	63	60%
Female	42	40%
Causes		
Hepatitis B	40	38.10%
Hepatitis C	54	51.43%
Hepatitis B and C	9	8.57%

Among 105 patients 15 (14.29%) patients were diagnosed to have hepatorenal syndrome while 90 (85.71%) patients had serum creatinine <1.5 mg/dl with no HRS. (Figure 1)

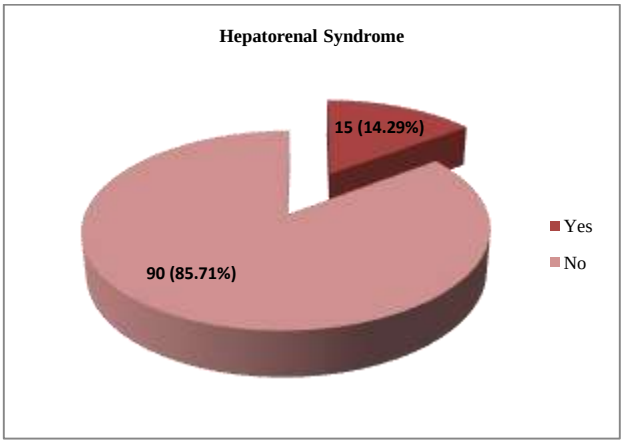

Figure 1: Frequency of Hepatorenal Syndrome

Out of 15 HRS patients, 4 (26.67%) were died, 5 (33.33%) patients were partially recovered and 6 (40%) patients were fully recovered after treatment. (Table 2)

Table 2: Short-term outcomes of Hepatorenal Syndrome (n=25)

Outcomes	Frequency No.	Percentage
Fully Recovered	6	40%
Partially Recovered	5	33.33%
Died	4	26.67%

DISCUSSION

Patients who have cirrhosis of the liver have an increased likelihood of developing problems that lower their life expectancy [13]. Injury to the kidneys is one of the most common consequences, particularly when portal hypertension is present [14]. In the setting of severe liver disease, HRS is the final stage that develops as a consequence of sustained loss of renal perfusion; it is linked with a bad prognosis [15]. We conducted present study with aimed to determine the frequency and short-term outcomes of hepatorenal syndrome in patients with chronic liver disease. In this regard 105 patients presented with liver cirrhosis were enrolled. Majority of patients 60% were males while 40% were females. Average age of patients was 46 years. These results were comparable to many of previous studies in which male patients population was high 45% to 60% as compared to females and majority of patients were ages between 40 to 60 years [16-17]. In Pakistan majority of liver cirrhosis patients are males, it is due to high rate of smoking and alcohol consumption in male population.

In present study we found that 40 (38.10%) patients had hepatitis B, 54 (51.43%) patients had hepatitis C and 9 (8.57%) patients had hepatitis B, C both as causes of chronic liver disease. Duration of disease was 5.46±3.82 years in our study. A study conducted by Fida S et al [18] to evaluate the frequency of HRS among cirrhotic patients demonstrated that according to etiology 24.26% patients had hepatitis B, 30.88% patients had hepatitis C, 8.09% patients had hepatitis B and C both and remaining patients were having cirrhosis due to different etiology.

In our study, among 105 patients 15 (14.29%) patients were diagnosed to have hepatorenal syndrome while 90 (85.71%) patients had serum creatinine <1.5 mg/dl with no HRS. Inayat Ullah et al [19] reported that the frequency of HRS among liver cirrhosis patients was 19.9%. Fida S et al [18] demonstrated that HRS was found in 10.3% patients who were diagnosed to have liver cirrhosis.

Several research have been conducted to evaluate the prevalence of HRS; these studies have found that the prevalence varies significantly depending on the HRS definition that was utilised as well as the inclusion and exclusion criteria that were considered. Seetlani et al. [17] recently found that 15% of 265 individuals diagnosed with cirrhosis also had HRS in their medical records. On the other hand, Salerno et al. [20] found that out of 253 patients diagnosed with cirrhosis and kidney damage, 45.8% exhibited HRS (30% HRS1 and 15.8% HRS2). If this is the case, then the prevalence is higher in HRS1, just as it was found to be in this study. Because there have been no previous investigations conducted in Colombia, this research was conducted using the criteria established by the ICA in 2007 [21].

In present study out of 15 HRS patients, 4 (26.67%) were died, 5 (33.33%) patients were partially recovered and 6 (40%) patients were fully recovered after treatment. According to the findings of a study that was carried out by Rey R M et al [22], out of the 28 patients diagnosed with HRS, 35% needed renal replacement therapy with hemodialysis, and 70% of these patients received a diagnosis of SHR1. Ninety percent of patients who underwent dialysis passed away within ninety days, while the remaining ten percent were offered a liver transplant as the definitive treatment.

Using terlipressin and albumin, 58 (37.2%) of 196 patients in a trial by Wang et al. showed improvement in renal function. Our findings demonstrate that 4 (28%) of the 14 patients studied made a complete recovery. When one considers that the artificial colloid Haemaccel was utilized in place of albumin, one may see why the results were different in terms of complete recovery. Constraints encountered during the trial included the high cost of treatment and noncompliant patients with regard to follow-up [10].

CONCLUSION

Liver cirrhosis is one of the most commonly found life threatening disease in all over the world and associated with high rate of

complications and HRS is frequently found complication associated with high rate of mortality and morbidity. In our study we concluded that frequency of hepatorenal syndrome in liver cirrhosis patients was high. And HRS was associated with high rate of mortality.

REFERENCES

1. Hepatic microcirculation and mechanisms of portal hypertension. Gracia-Sancho J, Marrone G, Fernández-Iglesias A. Nat Rev Gastroenterol Hepatol. 2019;16:221–234.
2. Assessment of knowledge about the risk Factors of chronic liver disease in patients admitted in Civil Hospital Karachi. Majid B, Khan R, Junaid Z, et al. Cureus. 2019;11:5945.
3. Epidemiology, pathophysiology, and management of hepatorenal syndrome. Amin AA, Alabsawy EI, Jalan R, Davenport A. Semin Nephrol. 2019;39:17–30.
4. Endothelin is an important determinant of renal function in a rat model of acute liver and renal failure. Anand R, Harry D, Holt S, et al. Gut. 2002;50:111–117.
5. Syndrome hépatorénal [Hepatorenal syndrome] Pillebout E. Nephrol Ther. 2014;10:61–68.
6. Rajekar H, Chawla Y. Terlipressin in hepatorenal syndrome: Evidence for present indications: Terlipressin in hepatorenal syndrome. J Gastroenterol Hepatol. 2011;26: 109–114. 10.1111/j.1440-1746.2010.06583.
7. Kazory A, Ronco C. Hepatorenal Syndrome or Hepatocardiorenal Syndrome: Revisiting Basic Concepts in View of Emerging Data. Cardiorenal Med. 2019;9: 1–7.
8. Ginès A, Escorsell A, Ginès P, Saló J, Jiménez W, Inglada L, et al. Incidence, predictive factors, and prognosis of the hepatorenal syndrome in cirrhosis with ascites. Gastroenterology. 1993;105: 229–236.
9. Leung W, Wong F. Hepatorenal Syndrome: Do the Vasoconstrictors Work? Gastroenterol Clin North Am. 2011;40: 581–598.
10. Wang H, Liu A, Bo W, Feng X, Hu Y. Terlipressin in the treatment of hepatorenal syndrome: A systematic review and meta-analysis. Medicine (Baltimore). 2018;97: e0431
11. Shah N, Silva RG, Kowalski A, Desai C, Lerma E. Hepatorenal syndrome. Dis Mon. 2016;62: 364–375.
12. Schmidt LE, Ring –Larsen H. Vasoconstrictor therapy for hepatorenal syndrome in liver cirrhosis. Current Phar. 2006; 12(35): 4637-47.
13. Wadei H. Hepatorenal Syndrome: A Critical Update. Semin Respir Crit Care Med. 2012;33: 55–69.
14. Regner KR, Singbartl K. Kidney Injury in Liver Disease. Crit Care Clin. 2016;32: 343–355.
15. Mackelaite L, Alsauskas ZC, Ranganna K. Renal Failure in Patients with Cirrhosis. Med Clin North Am. 2009;93: 855–869.
16. Ascites and hepatorenal syndrome. Adebayo D, Neong SF, Wong F. Clin Liver Dis. 2019;23:659–682.
17. Seetlani NK, Memon AR, Iftikhar F, Ali A, Fazel PA. Hepatorenal Syndrome In Patients With Cirrhosis Of Liver According To 2007 International Ascites Club Criteria. J Ayub Med Coll Abbottabad JAMC. 2016;28: 578–581.
18. Fida S, Khurshid SMS, Mansoor H. Frequency of Hepatorenal Syndrome Among Patients With Cirrhosis and Outcome After Treatment. Cureus. 2020 Aug 25;12(8):e10016.
19. Inayat Ullah, Ziauddin, Muhammad Bilal Khattak, Khalid Mahmood. FREQUENCY OF HEPATORENAL SYNDROME IN PATIENTS WITH LIVER CIRRHOSIS. KJMS May-August, 2016, Vol. 9, No. 2.
20. Salerno F, Cazzaniga M, Merli M, Spinzi G, Saibeni S, Salmi A, et al. Diagnosis, treatment and survival of patients with hepatorenal syndrome: A survey on daily medical practice. J Hepatol. 2011;55: 1241–1248.
21. Salerno F, Gerbes A, Gines P, Wong F, Arroyo V. Diagnosis, prevention and treatment of hepatorenal syndrome in cirrhosis. Postgrad Med J. 2008;84: 662–670.
22. Rey R M, Delgado AF, De Zubiria A, Pinto R, De la Hoz-Valle JA, Pérez-Riveros ED, Ardila G, Sierra-Arango F. Prevalence and short-term outcome of hepatorenal syndrome: A 9-year experience in a high-complexity hospital in Colombia. PLoS One. 2020 Oct 20;15(10):e0239834.