HYPONATREMIA; FREQUENCY AND OUTCOME IN PATIENTS WITH LIVER CIRRHOSIS

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Abstract... Background objective: Hyponatremia is not uncommon complication of liver cirrhosis and may affect hospital mortality. This study was aimed to determine frequency and outcome of hyponatremia in liver cirrhosis patients. Patients and Methods: The cirrhotic subjects were assessed for hyponatremia while outcome measured in relation to hyponatremia and its severity. Data was analyzed in SPSS 16.0 and frequencies as well as percentages calculated for hyponatremia. Results: Out of one hundred liver cirrhosis patients, 65% were males and 35% females. Mean age ± SD of overall cirrhotic subjects was 40.79±7.83. Hyponatremia was identified in 72% (51% males and 21% females) patients. The mean ± SD for sodium level in overall population was 129.73±8.35 while 119.92±3.61 in hyponatremic cirrhotic patients. Conclusion: Dilutional hyponatremia is a frequent finding in liver cirrhosis patients.

Key words: hyponatremia, liver cirrhosis, frequency

INTRODUCTION

Cirrhosis is a consequence of chronic liver disease characterized by replacement of liver tissue by fibrous scar leading to progressive loss of liver function. It is most commonly caused by hepatitis B or C and alcoholism but has many other possible causes.

Hyponatremia (serum Na+ < 135 mEq/L) is the most important electrolyte disorder and its homeostasis is vital to normal physiologic function of cells.¹⁻⁵ Identifying etiology and risk factors for hyponatremia will help in reducing its incidence and minimize complications associated with it and improve overall cost of healthcare. Patients with hyponatremia have a poor survival.⁶⁻¹¹ According to several studies, hyponatremia occurring as a result of reduced solute-free water clearance is key prognostic factor in patients of liver cirrhosis when hyponatremia was incorporated into severity of liver disease.¹²,¹³

There is lack of Pakistani data on clinical spectrum of hyponatremia in liver cirrhosis and treatment strategies to be adopted in various clinical studies hence we planned to undertake this prospective study in liver cirrhosis patients at our tertiary care hospital.

MATERIAL AND METHODS

This descriptive case-series study was conducted in Medical Unit-I of Liaquat University Hospital Hyderabad from 28-03-2012 to 27-09-2012. One hundred patients of liver cirrhosis were controlled by non-probability convincing. All participants gave informed and written consent and study was approved by institutional ethical committee.

We include patients of liver cirrhosis of either gender and ≥ 12 years of age. Our study exclude uncooperative patients, cirrhotics on diuretic therapy, hepato-cellular carcinoma and syndrome of inappropriate ADH secretion. Data was recorded on pre-designed proforma. All patients have undergone for detailed history followed by physical examination and appropriate laboratory investigations. About 2.0 mls of venous blood sample was taken and sent to laboratory for
estimation of severe sodium level. The frequency of hyponatremia was evaluated while cirrhosis severity assessed by clinical and biochemical score system i.e child-Pugh score.8

Data was entered and analysed in SPSS version 16.00. The stratification was done for quantitative and qualitative variables while descriptive statistics were used to calculate frequency. The mean ± SD was calculated and chi-square test applied at 95% CI, while p-value ≤ 0.05 considered to be statistically significant.

RESULTS
Total one hundred patients were evaluated for hyponatremia and their mean age was 40.79±7.83. Mean sodium level in all study participants was 129.73±83.51, 119.92±3.61 in hyponatremic cirrhotic patients. The sodium levels in male and female hyponatremic cirrhotics were 121.73±8.63 and 118.92±3.31 respectively. The mean age ± SD for hyponatremic males was 42.71±8.72 while 40.92±8.52 for females. Majority of our patients having hyponatremia were between ages 30-49 years. This is shown in table-I. The hyponatremia was observed in 72% (51 males and 21 females) patients. This is shown in table-II. The hyponatremic cirrhotic patients commonly presented with abdominal distension (17 cases), jaundice (16 cases), lower limb swelling (11 cases), GI bleeding (10 cases) and altered sensorium (9 cases). This is shown in table-III. In our study, majority 47 (65.3%) have recovered from hyponatremia while 6 (8.3%) were expired and most of them were males. This is shown in tables IV and V.

DISCUSSION
Our study found 72% prevalence rate of hyponatremia in liver cirrhosis of which 27.8% had mild, 41.7% moderate and 30.6% severe hyponatremia. Study by Angeli P et al14 had shown 50.6% mild, 27.8% moderate and 21.6% severe hyponatremia in cirrhotic patients.
Similar results were seen in study by Kim JH et al\(^{15}\), who found 52.1% mild, 20.8 moderate and 27.1% severe hyponatremic cirrhotics. Another study from Pakistan by Shaikh S et al\(^{16}\) also showed mild, moderate and severe hyponatremia in 48.4%, 24.9% and 26.7% liver cirrhosis patients. Borroni G et al\(^{17}\) conducted a study on hospitalized liver cirrhosis patients and according to serum sodium level, severe hyponatremia was detected in 29.8% in relation to ascites which is closer to our study results.

In present study, males were predominantly affected by hyponatremia which is consistent with study by XU Z et al\(^{18}\) Major presenting features were abdominal distension, jaundice and lower limb swelling in our study, while study by Kim SH et al\(^{19}\) also discovered abdominal pain, distension and jaundice as the main presenting features.

The frequency of hepato-renal syndrome was 11/72 (15%) with severe hyponatremia, 7/72 (9.7%) moderate hyponatremia, 3/72 (4%) mild hyponatremia and 1/72 (1.3%) with normal serum sodium concentration. Angeli P et al\(^{14}\) showed hepato-renal syndrome in 17% patients with severe hyponatremia, 10% moderate hyponatremia and 6% with normal sodium concentration which is quite closer to our study results.

Finally our study showed that mortality rate in higher (8.3%) in patients having moderate to severe hyponatremia. Hence it is important to note that proper and appropriate monitoring of serum sodium concentration is effective tool in management of liver cirrhosis.

### CONCLUSION

Dilutional hyponatremia is a frequent finding in liver cirrhosis patients leading to neurological impairment, hepato-renal syndrome, osteoporosis and high mortality. Therefore, early management of hyponatremia to prevent liver cirrhosis related complications.

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