

## Hyponatremia in Liver Cirrhosis

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### ABSTRACT

**Aim:** To record the rate of hyponatremia in cases with liver cirrhosis

**Study Design:** Cross sectional study.

**Place and Duration of Study:** Department of Gastroenterology, Liaquat University Hospital, Hyderabad from 1<sup>st</sup> April 2020 to 30<sup>th</sup> September 2020.

**Methodology:** One hundred enrolled all diagnosed liver cirrhosis cases in both male and females between 12-60 years of age whereas those with already on diuretic therapy, non-cirrhotic portal hypertension, acute fulminant hepatitis and those suffering from renal failure or requiring dialysis were excluded from the study. Blood sample was sent to the hospital pathology laboratory for evaluation of serum sodium level and it was reported by pathologist. Hyponatremia was assessed as serum sodium level <130 meq/L.

**Results:** The frequency of hyponatremia in patients having liver cirrhosis was calculated as 77 (59.23%) whereas 53 (40.77%) had no findings of the morbidity.

**Conclusion:** Hyponatremia was higher in liver cirrhosis, however, early diagnosis can be helpful to control the morbidity.

**Keywords:** Liver cirrhosis, hyponatremia, diagnosis

### INTRODUCTION

Liver cirrhosis is a medical condition where liver is irreversibly scarred. It results in significant chronic injuries affecting hepatic function due to change in structure of the organ causing portal hypertension.<sup>1</sup> It may cause morbidity and mortality. This common health issue is challenging for medical professionals. In our country, this morbidity is on the rise due to rise in hepatitis B and C.<sup>2</sup>

Serum sodium levels <130mEq/L is known as hyponatremia, it is an important disorder of electrolyte and for normal physiological function of the cell, its hemostasis is vital. It is important to identify etiological/risk factors to reduce its occurrence and complications associated with it.<sup>3</sup>

The chronic liver disease (CLD) cases are commonly complicated due to abnormal electrolyte levels/renal functions. The literature pointed out hyponatremia as an important prognostic factor in CLD cases where the survival rate in hyponatremia is power as compared to those with normal serum sodium levels.<sup>4</sup> Hyponatremia is an important/common complication in decompensated liver cirrhosis with higher mortality rate<sup>5</sup>.

The fluid management in cirrhotic cases is complicated due to severe hyponatremia.<sup>6</sup> It may develop in cirrhosis due to either hypervolemia or hypovolemia.<sup>7-8</sup>

The data is scared by recording 72%<sup>3</sup> and 10.5%<sup>6</sup> hyponatremia in liver cirrhosis cases. Considering this controversy, we planned to record this morbidity in liver cirrhosis cases, so that our results may help in determining the exact frequency of this morbidity in our population.

### METHODOLOGY

This cross-sectional study was conducted at Department of Gastroenterology, Liaquat University Hospital, Hyderabad from 1<sup>st</sup> April 2020 to 30<sup>th</sup> September 2020. A total of 100 diagnosed liver cirrhosis cases in both male and females between 12-60 years of age whereas those with already on diuretic therapy, non-cirrhotic portal hypertension, acute fulminant hepatitis and those suffering from renal failure or requiring dialysis were excluded from the study. Blood sample was sent to the hospital pathology laboratory for evaluation of serum sodium level and it was reported by pathologist. Hyponatremia was assessed as serum sodium level <130 meq/L. The data was entered and analyzed through SPSS-25.

### RESULTS

Age distribution shows that 40 (40%) were between 12-40 years of age shows whereas 60 (60%) were between 41-60 years of age with mean age was 42.14±8.75 years (Table 1). Gender distribution shows that 37 (37%) were male and 63 (63%) were females (Table 2). The frequency of hyponatremia in patients having liver cirrhosis was calculated as 77 (59.23%) whereas 53 (40.77%) had no findings of the morbidity (Table 3).

Table 1: Age distribution (n=100)

Age(in years)	No.	%
12-40	40	40.0
41-60	60	60.0
Mean±SD	42.14±8.75	

Table 2: Gender distribution (n=100)

Gender	No.	%
Male	37	37
Female	63	63

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Table 3: Frequency of hyponatremia in patients having liver cirrhosis (n=100)

Hyponatremia	No.	%
Yes	55	55
No	45	45

## DISCUSSION

Hyponatremia is associated with increased morbidity and mortality in patients with cirrhosis, and is an important prognostic marker both before and after liver transplant. We planned this study to record hyponatremia in liver cirrhosis cases, as the data is scarce and a long range of this morbidity is found, however, our results may help in determining the exact frequency of this morbidity in our population.

In our study, 40 (40%) were between 12-40 years of age whereas 60 (60%) were between 41-60 years of age with mean age was  $42.14 \pm 8.75$  years. Gender distribution shows that 37(37%) were male and 63(63%) were females. The frequency of hyponatremia in patients having liver cirrhosis was calculated as 77(59.23%) whereas 53 (40.77%) had no findings of the morbidity. Our findings are in agreement with a study reveals that hyponatremia was observed in 72% patients of liver cirrhosis.<sup>3</sup> Whereas contrary to another study, showing that hyponatremia was observed in 10.5%<sup>5</sup>.

Another local study<sup>7</sup> assessed the frequency of hyponatremia in patients of chronic liver disease and reveals that the mean age of the patients was  $46.31 \pm 15.82$  years. There were 54% males and 46% females. Mean duration of CLD was  $5.76 \pm 2.79$  years. Child-Pugh grade A was noticed in 34%, grade B in 30.7% and grade C in 35.3%. The mean sodium level  $142.71 \pm 15.54$  mmol/L. Hyponatremia was present in 33.3% cases. Mild hyponatremia was observed in 24(48%) cases, moderate hyponatremia in 25(50%) and severe hyponatremia in 1(2%) patients. Hyponatremia was present in 25.5% Child-Pugh class A, 39.1% in Child-Pugh class B and 35.8% in Child-Pugh class C. The difference was insignificant ( $P > 0.05$ ). The findings of this study are near to our results. One more study in Hyderabad showed the frequency of hyponatremia as 70% in patients of liver cirrhosis.<sup>8</sup> These findings also correspond to our results.

Symptoms of hyponatremia can be difficult to separate from symptoms that are often present in patients with end-stage liver disease and may include fatigue, confusion, dizziness, nausea, gait instability, and muscle cramps<sup>9</sup>.

As in hyponatremic patients without cirrhosis, raising the serum sodium in hyponatremic patients with cirrhosis may improve symptoms, although data are limited. As an example, in one unblinded and uncontrolled study of 24 cirrhotic patients with a serum sodium  $< 130$  mEq/L, raising the serum sodium with fluid restriction, withholding diuretics, and, in some patients, prescribing tolvaptan was associated with modest improvement in some but not all cognitive tests.<sup>10</sup>

## CONCLUSION

The frequency of hyponatremia was higher in patients having liver cirrhosis however, early detection may help to control the morbidity.

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