



SERUM SODIUM AS A PRONOSTIC FACTOR IN DECOMPENSATED LIVER DISEASE

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ABSTRACT

OBJECTIVE: To Study serum sodium as prognostic marker in decompensated liver disease patients and relate the complications with serum sodium levels **Methods:** To study the serum sodium levels in decompensated liver disease and to analyse the correlation of serum sodium levels with complications associated with DCLD patients, and the effect of treatment and outcome based on serum sodium levels. 145 patients who were diagnosed as DCLD based on investigations and imaging, serum sodium levels and complications were analysed. They were compared with modified Child Pugh Score based on serum sodium levels. **Results:** Out of the 145 patients serum sodium was ≤ 125 mEq/L in 45, serum sodium was > 125 mEq/L in 100. complications like ascites, Portal hypertension, coagulopathy, Hepatorenal syndrome were associated with higher incidence in patients with serum sodium was ≤ 125 mEq/L, with p value of 125 mEq/L has a favorable outcome compared to serum sodium was ≤ 125 mEq/L. **Conclusions:** Hyponatremia is commonly seen in DCLD patients. More severe is hyponatremia more severe the complications. Serum sodium can be used to predict the outcome in patients with DCLD.

KEYWORDS :**INTRODUCTION-**

Cirrhosis of liver can be due to infections viral (HBV, HCV, HDV), toxic (alcohol, arsenic), metabolic, Biliary disorders, vascular lesion like Budd chiari syndrome. It's defined as diffuse hepatic fibrosis associated with replacement of normal liver by nodules. The rate of progression of the disease varies depending on the etiological agent. Whatever the etiology 80 – 90 % of liver function has to be lost before hepatic failure ensues. Decompensated chronic liver disease is associated with ascites, Portal hypertension, UGI bleed, hepatorenal syndrome, coagulopathy, spontaneous bacterial peritonitis, hepatic encephalopathy. Serum sodium is major cation in the extracellular space and it is major contributor to ECF volume and oncotic pressure. Serum sodium decreased in patients with decompensated liver disease (DCLD). Since hyponatremia is associated with various complications of DCLD, it can be used for assessing the prognosis of patients. Hyponatremia is defined as serum sodium less than 135 meq/L. Hypernatremia is said to be present when the serum sodium concentration is greater than 145 meq/L. This study is done to assess the importance of serum sodium in DCLD patients and using it for predicting complications in them

OBJECTIVE-

- 1) To study serum sodium levels in decompensated liver disease patients and complications associated with DCLD.
- 2) To relate the complications with serum sodium levels and its correction with reduction in complications.

METHODS-

Study Centre: Kurnool medical college kurnool
Duration of the Study : August 2021 to July 2022
Sample Size : 145 patients

Methodology : Sample size of the study was calculated using the formula $4pq/d$, p = prevalence of the disease, $q = 1 - p$, d = error range. 145 patients were studied. Patients who were admitted in our medical ward and willing for the study were included, subjected to clinical history and examination. Blood samples were collected for liver function tests, serum electrolytes and coagulation profile (PT, INR). Ultrasonogram of abdomen was done and assessed for the liver echoes to confirm the nature of the disease. Portal vein Doppler study and Ascitic fluid analysis were done.

Study Design : Prospective observational study

Inclusion Criteria : Decompensated liver disease patients were diagnosed by clinical history, examination, biochemical investigations and imaging studies like USG Abdomen

Exclusion criteria : Patients with CCF, CKD, on drugs such as SSRI's,

TCA's, MAO inhibitors, cytotoxic drugs

Statistical analysis plan : Data analysed using statistical package – SPSS software

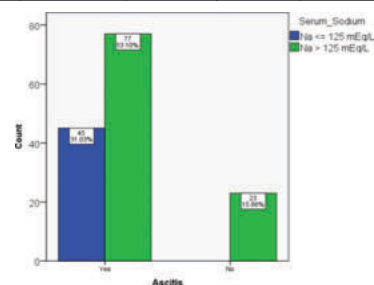
Consent : Written consent were obtained from the patient and attender.

OBSERVATION AND RESULTS-

In this study, 145 patients are included based on eligibility criteria, following table depicts the age distribution. Most of them were above 40 years. The mean age is 51.75 years. Of the 145 patients 142 were male and 3 were female. Regarding the etiology of DCLD 142 were related to alcoholism and 3 were due to Hepatitis B. Of the Patients with serum sodium < 125 mEq/L 45 out of 45 (100%) has ascites and 77 (77%) patients whose serum sodium > 125 mEq/L has ascites. Its p value is < 0.001 , which is significant.

Table 1- Comparison Of Ascites In Relation To Serum Sodium Groups

ASCITES	Na < 125 mEq/L		Na > 125 mEq/L		P value
	Count	percent	Count	Percent	
Present	45	100%	77	77%	
Absent	0	0	23	23%	



Graph 1- Comparison Of Ascites In Relation To Serum Sodium Groups.

Of the patients with serum sodium < 125 mEq/L group 36 out of 45 patients (80%) has PHT. In serum sodium > 125 mEq/L group 53 out of 100 (53%) patients has PHT. p value is 0.002 is significant. In serum sodium group < 125 mEq/L only 9 out of 45 patients (20%) has UGI bleed. In serum sodium > 125 mEq/L 21 out of 100 patients (21%) has UGI bleed. Its p value is 0.891 which is not significant. In serum sodium < 125 mEq/L group 19 out of 45 (42.2%) has coagulopathy. In the serum sodium > 125 mEq/L group 3 out of 100 (3%) has coagulopathy. p value is < 0.001 . In Serum Sodium Group < 125 mEq/L 11 out of 45 (24.4%) has HRS. Whereas in serum sodium > 125 Meq/L

group only 5 out of 100 has HRS. P value is 0.001 which is significant. In serum sodium <125 mEq/L group 20 out of 45 (34.5%) has hepatic encephalopathy in different grades. In serum sodium group > 125mEq/L 8 out of 100 (8%) has hepatic encephalopathy. P value is < 0.001 is significant.

In serum sodium <125 mEq/L group serum bilirubin mean was 8.04, SD was 1.61 and, whereas in >125 mEq/L group mean was 5.32, SD was 3.07, p value was < 0.001. In serum sodium <125 mEq/L group serum albumin mean was 2.21, SD was 0.44 and, whereas in >125 mEq/L group mean was 2.81, SD was 0.34, p value was < 0.001. In serum sodium <125 mEq/L group INR mean was 1.67, SD was 0.71 and, whereas in >125 mEq/L group mean was 1.16, SD was 0.31, p value was <0.001.

Table 2- Distributions Of Variables In Relation To Serum Sodium

	GROUP	Na	MEAN	STD. DEVIATION	p VALUE BY 't' TEST
Serum Bilirubin	Na <= 125 mEq/L	45	8.04	1.61	<0.001
	Na > 125 mEq/L	100	5.32	3.07	
Serum Albumin	Na <= 125 mEq/L	45	2.21	0.44	<0.001
	Na > 125 mEq/L	100	2.81	0.34	
INR	Na <= 125 mEq/L	45	1.67	0.71	<0.001
	Na > 125 mEq/L	100	1.16	0.31	

Out of 145,3 (6.7%) patients expired on follow up. All of them in the serum sodium group <= 125 mEq/L group

DISCUSSION-

Ascites, portal hypertension, coagulopathy, hepatorenal syndrome, spontaneous bacterial peritonitis, hepatic encephalopathy have significant association with hyponatremia. Upper GI bleed has no significant association with hyponatremia. Mortality also seen in patients with hyponatremia.

CONCLUSION-

In DCLD hyponatremia is frequent association. This study was done to signify the importance of serum sodium and its use as prognostic factor in DCLD patients to predict impending complications. In patients with serum sodium <= 125 mEq/L were associated with more complications and hence higher in Child class and associated with mortality. Thus, Serum sodium can be used as prognostic factor in patients with Decompensated liver disease.

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