

## Hyponatremia and Hypoalbuminemia: Prognostic Markers for Chronic Liver Disease Patients

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### Abstract:

**Background:** To study the hyponatremia and hypoalbuminemia as a poor prognostic marker in chronic liver disease patients, Chronic liver disease (CLD) is a progressive deterioration of liver functions for more than six months, which includes synthesis of clotting factors, other proteins, detoxification of harmful products of metabolism, and excretion of bile.

**Methods:** Observational longitudinal Study. Department of General medicine at JNKTMCH Madhepura. Patients with chronic liver disease were recruited from medical wards after obtaining ethical clearance and written informed consent from the patient.

**Result:** Serum albumin was lower among patients who died than survivors. Serum sodium was lower among patients who died than survivors. Serum potassium was higher among patients who died than survivors.

**Conclusion:** We concluded that hyponatremia and hypoalbuminemia was a poor prognostic marker in chronic liver disease patients.

**Keywords:** K, Na, Albumin.

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### Introduction

Chronic liver disease (CLD) is a progressive deterioration of liver functions for more than six months, which includes synthesis of clotting factors, other proteins, detoxification of harmful products of metabolism, and excretion of bile. CLD is a continuous process of inflammation, destruction, and regeneration of liver parenchyma, which leads to fibrosis and cirrhosis. The spectrum of etiologies is broad for chronic liver disease, which includes toxins, alcohol abuse for a prolonged time, infection, autoimmune diseases, genetic and metabolic disorders. Cirrhosis is a final stage of chronic liver disease that results in disruption of liver architecture, the formation of widespread nodules, vascular reorganization, neo-angiogenesis, and deposition of an extracellular matrix. The underlying mechanism of fibrosis and cirrhosis at a cellular level is the recruitment of stellate cells and fibroblasts, resulting in fibrosis, while parenchymal regeneration relies on hepatic stem cells. Chronic liver disease is an extremely common clinical condition, and the focus is done on the common etiologies, clinical manifestations, and management. [1-2]

Hyponatremia in advanced cirrhosis results from the hemodynamic complications associated with worsening portal hypertension, primarily

intravascular hypovolemia and renal hypoperfusion in the setting of total body volume overload. Furthermore, the hepatic synthetic dysfunction associated with cirrhosis leads to abnormally low serum levels of albumin, a negatively charged protein that helps maintain adequate plasma oncotic pressure. Albumin therapy for intravascular volume expansion in cirrhosis was introduced as early as the 1950s, and has been shown in small studies to be superior to normal saline or fluid restriction for correcting serum sodium in cirrhotics. [3]

### Material and Methods

Patients with chronic liver disease were recruited from medical wards after obtaining ethical clearance and written informed consent from the patient.

**Study Design:** Observational longitudinal follow up study. Department of General medicine at Jannayak Karpoori Thakur Medical college and Hospital Madhepura, Bihar.

### Inclusion Criteria

- Patients of more than 18 years of age.
- Adult patients diagnosed with chronic liver disease.

### Exclusion Criteria

- Patients with ascites due to tuberculosis or malignancy.
- Patients with malignancies other than hepatocellular carcinoma.

### Data analysis

Interpretation and analysis with comparison of obtained results was carried out and data thus collected were subjected to descriptive statistical analysis of patients with chronic liver disease using

SPSS 19, Student's T-test was used for comparison of continuous data. p-value <0.05 was considered significant. All reported P values are two sided.

### Results

Age range of patients was from 20 to 80 years. Mean age of patients was 48.94±12.63 years. Male preponderance was seen in our series. Maximum number of patients of chronic liver disease were in the age group of 51 to 60 years.

**Table 1: Mortality among CLD patients**

Outcome	No. of Patients	Percentage
Alive	170	85.00
Expired	30	15.00

Out of total 200 patients 15.00% patients expired while 85.00% were survivors.

**Table 2: Comparison of baseline laboratory parameters and scores between survivors and the patients who died within 3 months**

	Total patients	Survivors	Patients who died	p -value
Serum Albumin (g/dL)	2.30±0.65	2.41±0.62	1.75±0.52	0.001
Serum Sodium (mmol)	131.58±4.68	133.05±4.19	130.028±6.28	0.002
Serum Potassium (mmol)	4.18±1.12	4.18±1.15	4.29±1.08	0.511

### Unpaired 't' Test

Serum albumin was lower among patients who died than survivors. Serum sodium was lower among patients who died than survivors. Serum potassium was higher among patients who died than survivors.

### Discussion

As the liver cirrhosis progresses, there is fall in serum sodium concentration. It is a negative prognostic factor associated with increased short-term mortality. During cirrhosis, hyponatremia results from solute free water retention.

Volume expansion with resuscitative fluid infusion is often required for hospitalized cirrhotic patients. Evidence supports human serum albumin infusion in the treatment of certain specific complications of cirrhosis including HRS and prevention of both acute kidney injury in SBP and post-paracentesis circulatory dysfunction following large volume paracentesis. However, given the significantly higher cost associated with albumin compared to crystalloid, limiting administration to appropriate clinical indications is essential. [4]

Albumin infusion is postulated to confer many benefits to cirrhotic patients beyond volume expansion, including immunomodulation, antioxidant effects, endothelial stabilization, and hemostatic effects, any and all of which might contribute to increased survival. [5]

### Conclusion

We concluded that hyponatremia and hypoalbuminemia was a poor prognostic marker in chronic liver disease patients

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