|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2019: 79.34
Original Research Article
Volume 5, Issue 7; July: 2021; Page No. 150-152

STUDY THE RELATION BETWEEN SERUM SODIUM AND THE MODEL FOR END-STAGE LIVER DISEASE SCORE IN PATIENTS WITH LIVER CIRRHOSIS AT TERTIARY CARE HOSPITAL BIKANER, RAJASTHAN

Dr. Ved Prakash Meghwal[1], Dr. Rohitash Kularia[2]

[1] Resident Doctor, Department of General Medicine, Sardar Patel Medical College, Bikaner
[2] Professor, Department of General Medicine, Sardar Patel Medical College, Bikaner

Article Info: Received 18 May 2021; Accepted 23 July 2021
DOI: https://doi.org/10.32553/ijmbs.v5i7.2048
Corresponding author: Dr. Ved Prakash Meghwal
Conflict of interest: No conflict of interest.

Abstract

Background: Liver cirrhosis was common problem in india. The aim of the study was to evaluate the prevalence of hyponatremia in liver cirrhosis and the correlation between serum sodium and the Model for End-Stage Liver Disease (MELD) score in patients with liver cirrhosis.

Methods: We prospectively collected data of 100 patients of chronic liver disease hospitalized in department of General Medicine Sardar Patel medical college, Bikaner.

Results: Mean age of patients was 52.11±14.63 years and consisted of 78 men and 22 women. The mean MELD score, 14.21±4.98 and mean serum sodium concentration, 133.21±8.24 mmol/L. Serum sodium values were strongly associated with severity of cirrhosis, assessed by child Pugh class and MELD score.

Conclusion: Hyponatremia is a common problem in liver cirrhosis, especially advanced cirrhosis. The study showed that there is an association between hyponatremia and the presence of certain complications of liver cirrhosis. Also hyponatremia was associated with a higher severity of cirrhosis assessed by MELD scores.

Keywords: Child pugh class, Liver cirrhosis, MELD score, Hyponatremia

Introduction

Liver disease constitutes significant number of patients in various countries around the world and presents serious health related as well as economic problems.[1] The pattern of liver disease varies geographically, among various ethnic groups with different practices and time period. [2] The major causes of diseases are alcohol, infections, autoimmune, genetic, inflammatory, drug and malignancy.[3]

Aetiology of chronic liver disease (CLD) varies in different geographical area of the world. Hepatotropic viruses are the major causes of CLD in most parts of the world. [4]Alcohol constitutes an important cause in developed countries and in certain regions of India as well. With routine screening of blood and blood products of hepatitis B (HBV) markers and vaccination during last few decades, frequency of HBV as a cause of CLD has decreased in the developed world; therefore hepatitis C virus (HCV) remains the major cause there. Scanty data on aetiological spectrum of CLD from Northern India suggest preponderance of HBV as cause of CLD and infrequency of HCV.[5-7]

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.[8]

Material and Method

We prospectively collected data of 100 patients of chronic liver disease hospitalized in General Medicine department of Saradr Patel Medical college, Bikaner

Patients were included according to following criteria

1) Chronic liver disease is diagnosed, by combination of clinical,biochemical and ultrasonographic findings or histology

2) Presence of ascites determined by Ultrasonography or paracentesis

Data collected was analyzed for various parameters which included demographic features, etiology, severity, and duration of cirrhosis. Severity assessed using the child pugh score and model for end stage liver disease score. Duration of cirrhosis was estimated in years since diagnosis. Patients taking diuretic were classified based on type and number of diuretic they were taking. Other parameters which were studied were: spontaneous bacterial peritonitis(SBP), gastrointestinal bleed,

hepatic encephalopathy (HE) and hepatorenal syndrome (HRS). Lab parameters studied included : complete blood count, prothrombin time/international normalized ratio, liver function test including serum bilirubin, transaminases, serum alkaline phosphatase, total protein, albumin,globulin, albumin/ globulin ratio, serum creatinine, blood urea, serum sodium, serum potassium. Ascitic fluid analysis was done to rule out spontaneous bacterial peritonitis

Data Analysis:

Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

Results

Table 1: General characteristics

Mean age		52.11±14.63 Yrs
Male : female		22:78
Duration of cirrhosis		4.15±1.12 Yrs
Etiology	Alcohol	58(58.00%)
	HBV	14(14.00%)
	HCV	6(6.00%)
	NASH	8(8.00%)
	Others	14(14.00%)
Serum sodium		133.21±8.24
MELD score		14.21±4.98

Mean age of patients was 52.11±14.63 years and consisted of 78 men and 22 women. Causative factors for liver cirrhosis included chronic hepatitis B (14 cases), chronic hepatitis C (6 cases), alcoholic liver disease (58 cases) and other diseases (14 cases). The mean MELD score, 14.21±4.98 and mean serum sodium concentration, 133.21±8.24 mmol/L.

Table 2: Characteristicsof cases according to biochemical parameters and severity of cirrhosis

Serum Sodium meq/l		S, Na (meq/l)	CTP	MELD
less130	Mean	126.89	11.41	22.01
(N=42)	SD	3.46	1.91	8.16
131 to135	Mean	132.68	10.18	17.24
(N=11)	SD	1.32	2.14	5.98
more135	Mean	138.46	9.68	15.23
(N=47)	SD	2.84	2.18	6.09
p- Value		<0.001	<0.001	<0.001

Serum sodium values were strongly associated with severity of cirrhosis, assessed by child Pugh class and MELD score.

Discussion

The current study is an attempt to study the relationship between serum sodium concentration in patients of advanced chronic liver disease and its relationship with the occurrence of various decompensation events. Study has revealed that a large proportion of patients of advanced chronic liver disease have abnormal serum sodium levels. In our cohort almost one half of patients with advanced liver disease had values of serum sodium values below normal range (≤135 meq/l). Low serum sodium has not shown any association with age, sex or etiology of chronic liver disease but were more frequent in patients with advanced parenchymal liver failure.

Similar results were obtained by other studies. These studies were conducted on randomly chosen decompensated cirrhotic patients only. In the study conducted by Angeli *et al.* [8] on 997 patients with liver cirrhosis having ascites, the prevalence of hyponatremia was 49.4%.

In the study by Kim *et al.* [9] conducted on 188 cirrhotic patients with ascites the prevalence of hyponatremia was 47.9%. In the study by Shaikh *et al.* [10] conducted on 217 cirrhotic ascitic patients the prevalence of hyponatremia was 51.6%. Khalil *et al.* [11] showed a prevalence of hyponatremia of 65.5% among 200 decompensated cirrhotic patients.

The prevalence of hyponatremia in our study may be slightly higher than that seen in most of the above-mentioned studies. That is because our study focused on certain complications that may have an association with hyponatremia unlike other studies that were conducted on randomly chosen decompensated cirrhotic patients.

Conclusion

Hyponatremia is a common problem in liver cirrhosis, especially advanced cirrhosis. The study showed hyponatremia was associated with a higher severity of cirrhosis assessed by MELD scores and child Pugh class.

References

1. Cortez PH, Marques VP, Monteiro E. Liver disease related admissions in Portugal: Clinical and demographic pattern. Eur J Gatroenterol Hepatol. 2004;16(9):873-7.
2. Shrestha SM. Liver disease in Nepal. Kathmandu Univ Med J. 2005;3(2):178-80.
3. Ghany MG, Hoofnagle JH. Approach to a patient with liver disease. In :Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J eds. Harrison's Principles of Internal Medicine. 17th ed. USA: McGraw Hill Companies;2008. P. 1809.
4. Cacciola I, Pollicino T, Squadrito G, Cerenzia G, Orlando ME, Raimondo G. Occult hepatitis B virus infection in patients with chronic hepatitis C liver disease. New Engl J Med. 1999;341:22-6.
5. Sarin SK, Chari S, Sundaram KR, Ahuja RK, Anand BS, Broor SL. Young vs. Adult cirrhotics: a prospective comparative analysis of the clinical profile, natural course and survival. Gut. 1988;29:101-7.
6. Alter MJ, Kruszon MD, Nainan OV, Mequillan GM, Gao F, Moyer LA et al. The prevalence of hepatitis C virus infection in United States. N Engl J Med. 1999;341:556-62.
7. Alter JM, Margolis HS, Krawczynski. The natural history of community acquired hepatitis C in the United States. N Engl J Med. 1992;327: 1899-905.
8. Angeli P, Wong F, Watson H, Gin'es Pand the CAPPS Investigators. Hyponatremia in cirrhosis: results of a patient population survey. Hepatology 2006; 44 :1535-1542
9. Kim JH, Lee JS, Lee SH, Bae WK, Kim NH, Kim KA, *et al.* The association between the serum sodium level and the severity of complications in liver cirrhosis. Korean J Intern Med 2009; 24 :106-112.
10. Shaikh S, Mal G, Khalid S, Baloch GH, Akbar Y. Frequency of hyponatraemia and its influence on liver cirrhosis-related complications. J Pak Med Assoc 2010; 60 :116-120
11. Khalil OA, Abdel-aziz A, el-okely AM, Mikheil NG, Al-nahal S. Prevalence of hyponatremia and its association with development and severity of complications in cirrhotic patients. ZUMJ 2013; 19:323-330.