International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 4, Issue 2, pp: (1290-1293), Month: October 2016 - March 2017, Available at: www.researchpublish.com

Study of Hyponatremia in Cirrhosis of Liver & It's Prognostic value

[1]Dr. Shirobhi Sharma, [2]Nishant Wadhera, [3]Abhishek Gupta, [4]Sirohi T.R, [5]S.K.Virmani

P.G Dept. of Medicine: Subharti Medical College

1. AIM AND METHOD

Aim: Dilutional Hyponatremia associated with liver cirrhosis is caused by impaired free water clearance. Sever studies have shown serum sodium level correlate with survival in cirrhotic patients. Low serum sodium concentration is an independent predictor of mortality in patients of cirrhosis, but prevalence and clinical signification is unclear. Little is known regarding the relationship between the degree of dilutional hyponatremia[1] and development in cirrhosis and evaluate the association between the serum sodium level and severity of complication in cirrhosis and its prognostic significance.

Methods: Data of patients with cirrhosis were collected prospectively using:

Inclusion Criteria:

All patients with cirrhosis of liver

Exclusion Criteria:

- Patients with cardiac failure
- Patient on diuretic therapy.
- Patients with chronic kidney disease
- Patients on drugs like SSRI, TCA, MAO inhibitors, cytotoxic drugs etc.

The prevalence and serum sodium level and severity of complication were analysed.

2. OBSERVATIONS AND RESULTS

The prevalence of dilutional hyponatremia, classified as serum sodium concentration of <130-135meq/L and <130 meq/L were 34% and 24% respectively[2]. The serum sodium level were strongly associated with the severity of liver function impairment as assessed by Child-Pugh and MELD[3] score (p=<0.0001). Patients with serum sodium <130 meq/L had greatest frequency of these complications, but frequency was also increased in patients with mild reduction in serum sodium levels (131-135 meq/L).

Demographic details-

SR.No	COMPLICATION	**≤130 meq/L (n = 34)**	**131-135 meq/L(n=20)**	**≥136 meq/L (n = 46)**	P value
1.	**Age**(years) (Mean ± SD)	45.47±10.28	45.75±11.93	44.09±9.640	0.7706
2.	**Sex:** (Number) (%) **M** **F**	 29(85%) 5(15%)	 17(85%) 3(15%)	 38(83%) 8(17%)	0.9401[@]
3.	**Cause of cirrhosis:** (Number)(%)				

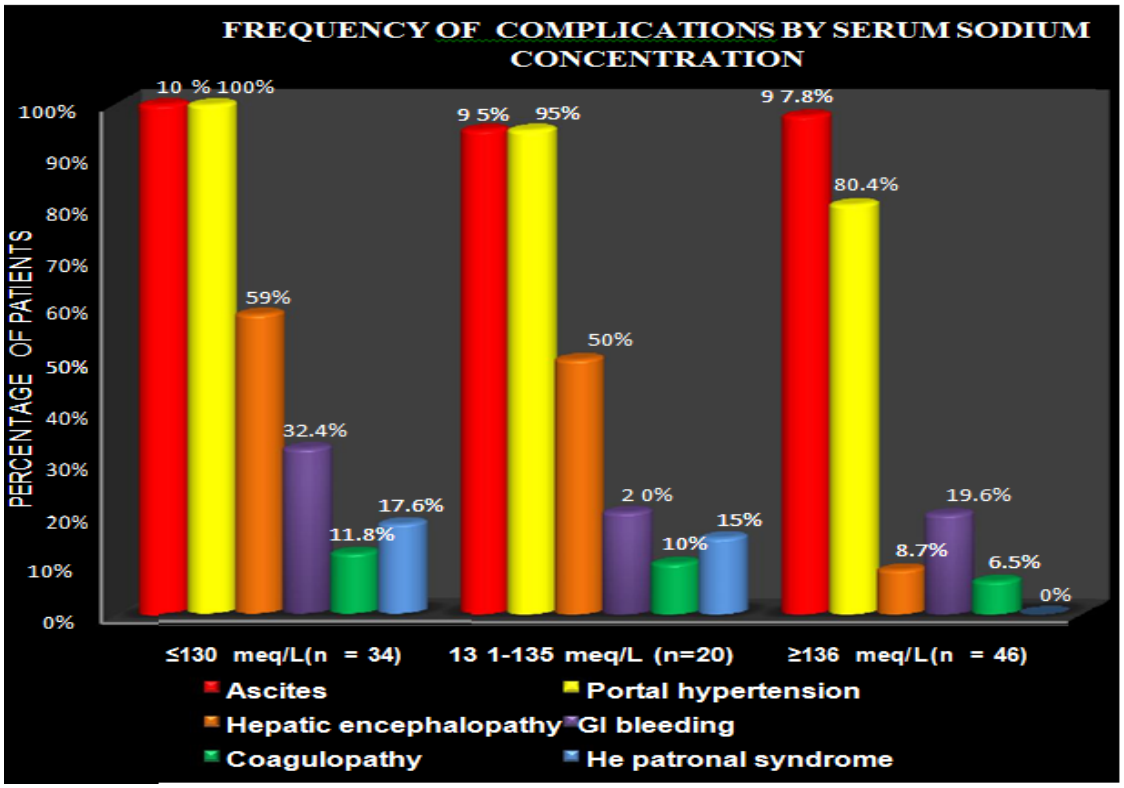
	Alcohol: **HBV :** **HCV:** **Other:**	32(76%) 2(4%) 8(20%) 0(0)	20(76%) 0(0) 6(24%) 0(0)	44(92%) 2(4%) 2(4%) 0(0)	0.0552[@]
4.	**MELD score** (Mean ± SD)	25.91±8.092	28.00±8.385	18.17±5.591	< 0.0001
5.	**Child-Pugh score**	10.5±1.6	9.8± 1.7	7.8±1.6	<0.0001*
6.	**Child-Pugh class** **Class A** **Class B** **Class C**	 1 13 20	 1 9 10	 15 23 8	 < 0.0001

Patients were classified according to level of serum sodium, 46(46%) belong to the group of serum sodium concentrations ≥136 meq/L. While, 34(34%) and 20(20%) patients were belong to serum sodium concentration group of ≤130 meq/L and 131-135 meq/L respectively. Mean age in these three groups, ≤130 meq/L, 131-135 meq/L and ≥136 meq/L was 45.47+10.28, 45.75+11.93 and 44.09 +9.640 respectively, which were comparable and no statistical difference was found in these three groups (p value=0.7706)

FREQUENCY OF COMPLICATIONS BY SERUM SODIUM CONCENTRATION[4]

Sr.No	COMPLICATION	≤130 meq/L (n = 34)	131-135 meq/L(n=20)	≥136 meq/L (n = 46)	P value
1	Ascitis	34(100%)	19(95%)	45(97.8%)	0.0621
2	Portal Hypertension	34(100%)	19(95%)	37(80.4%)	0.0111
3	Hepatic Encephalopathy	20(59%)	10(50%)	4(8.7%)	<0.0001
4	GI Bleeding	11(32.4%)	4(20%)	9(19.6)	0.6904
5	Coagulopathy	4(11.8%)	2(10%)	3(6.5%)	0.7094
6	Hepatorenal Syndrome	6(17.6%)	3(15%)	0(0)	0.0140

There was significant difference in three groups of ≤130 meq/L, 131-135 meq/L and ≥136 meq/L with respect to the complications of liver cirrhosis namely portal hypertension, hepatic encephalopathy, hepatorenal syndrome



COMPARISON OF COMPLICATIONS ACCORDING TO SERUM SODIUM[5]

Sr.No	COMPLICATION	≤130 meq/L(n = 34)	≤130 meq/L (n = 34)	131-135 meq/L(n=20)	
		ODD ratio(95%CI)	P value	ODD ratio(95%CI)	P value
1	Ascitis	2.28 (0.09 to 57.61)	1.000	0.42 (0.03 to 7.11)	0.5175
2	Portal Hypertension	17.48 (1 to 312)	0.0086	4.62 (0.54 to 39.25)	0.2607
3	Hepatic Encephalopathy	10.5 (3.08 to 35.8)	<0.0001	19.5 (4.92 to 77.3)	<0.0001
4	GI Bleeding	1.96 (0.71 to 5.5)	0.2049	1.03 (0.28 to 3.83)	1.0000
5	Coagulopathy	1.9 (0.4 to 9.2)	0.4505	1.6 (0.25 to 10.36)	0.6348
6	Hepatorenal Syndrome	15.70 (0.86 t0 287.8)	0.0113	18.6 (0.91 to 379.0)	0.0249

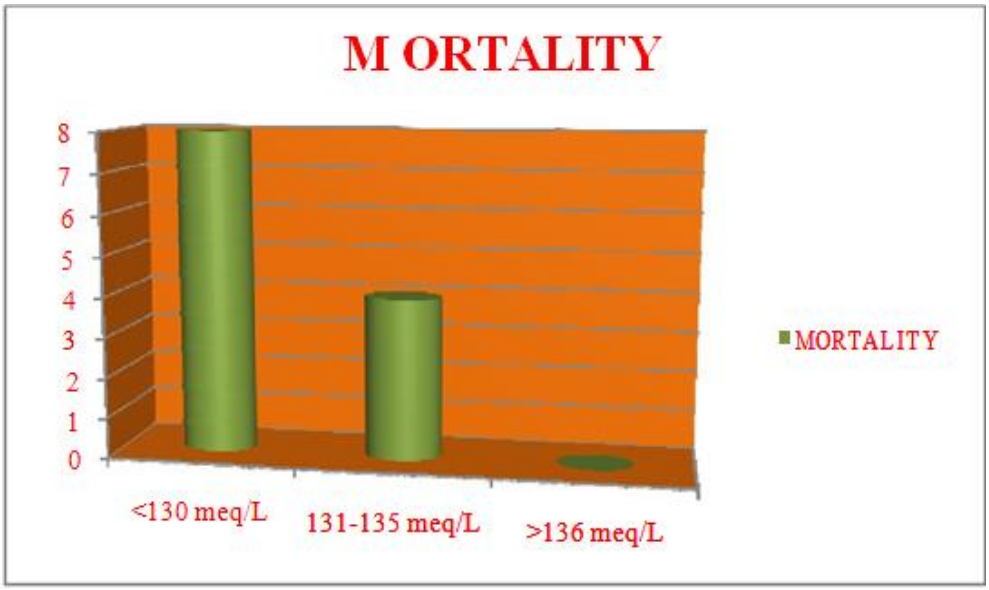
Patients with a serum sodium ≤130meq/L, as compared with serum sodium ≥136 meq/L had a significantly increased risk for developing complications: 17.48(95% CI=1 to 312, p=0.0086) for portal hypertension [6], 10.5 (95% CI=3.08 to 35.8, p=< 0.0001) for hepatic encephalopathy and15.70 (95% CI=0.86 to 287.8, p=0.0113) for hepatorenal syndrome. However no statistical difference and increased risk was found for ascites, gastrointestinal bleeding and Coagulopathy (p value=1.000, 0.2049, 0.4505 respectively).

Patients with a serum sodium 131-135 meq/L, as compared with serum sodium ≥136 meq/L had a significantly increased risk for developing complications: 19.5 (95% CI=4.92 to 77.3, p=< 0.0001) for hepatic encephalopathy and 18.6 (95% CI=0.91 to 379.0, p=0.0249) for hepatorenal syndrome[7]. However no statistical difference and increased risk was found for ascites, portal hypertension, gastrointestinal bleeding and coagulopathy (p value=0.5175, 0.2607, 1.0000, 0.6348 respectively).

MORTALITY ACCORDING TO SERUM SODIUM CONCENTRATION [8]

	≤130 meq/L (n = 34)	131-135 meq/L(n=20)	≥136 meq/L (n = 46)	P value
MORTALITY	8(23.7%)	4(20%)	0(0%)	0.0037

8 (23.7%) patients died in group of serum sodium levels ≤130 meq/L, while 4 (20%) patients died in group of serum sodium levels 131-135 meq/L. No patient died in group of serum sodium levels ≥136 meq/L. Statistically significant difference was found in mortality in three groups (p value=0.007).Mortality was more in patients with lower sodium 135meq/L compared to normal serum sodium concentration.



3. CONCLUSION

- The prevalence of hyponatremia in this study was 54%.
- Severity of hyponatremia was associated high frequency of complications of cirrhosis.
- There was a significant association between hyponatremia and hepatic encephalopathy, hepatorenal syndrome.
- There was no significant association between hyponatremia and ascites
- There was no significant association between hyponatremia and Coagulopathy.
- There was no significant association between hyponatremia and variceal bleeding.
- In this study mortality was 12% in patients with hyponatremia.
- Dilutional hyponatremia is frequent in cirrhotic patients and low serum sodium levels in cirrhosis are associated with severe complication of liver cirrhosis like hepatic encephalopathy, hepatorenal syndrome etc.
- Treatment of hyponatremia is important to prevent possible complication of liver cirrhosis.

REFERENCES

[1] David B. Mount. Fluid and electrolyte disturbances. In: Dan L. Longo, Denns L. Kasper, J. Larry Jameson, Anthony S. Fauci, Stephen L. Hauser, Joseph Loscalzo. Harrison's Principals Of Interal Medicine. 18th ed. USA. Mc Graw Hill; 2012 vol I:341-360.

[2] Arroyo V. Electrolyte and circulatory changes in terminal liver failure. J Hepatol. 2002 Mar;36(3):315-20.

[3] Heuman DM, Abou-Assi SG, Habib A, Williams LM, Stravitz RT, Sanyal AJ, Fisher RA, Mihas AA. Persistent ascites and low serum sodium identify patients with cirrhosis and low MELD scores who are at high risk for early death. Hepatology. 2004; 40(4): 802–810.

[4] Bengus and RD Babiuc . Hyponatremia – predictor of adverse prognosis in cirrhosis. J Med Life. 2012 Jun 12; 5(2): 176–178.

[5] Shaikh S, Mal G, Khalid S, Baloch GH, Akbar Y. Frequency of hyponatraemia and its influence on liver cirrhosis-related complications. JPMA. 2010; 60:116.

[6] Kamath P S, Wiesner R H, Malinchoc M, Kremers W, Therneau T M., Kosberg C L et al. A model to predict survival in patients with End-stage Liver Disease. Hepatology. 2001; 33:464–470.

[7] Porcel A, Diaz F, Rendón P, Macías M, Martín-Herrera L, Girón-González JA. Dilutional Hyponatraemia in Patients with Cirrhosis and Ascites. Archives of Internal Medicine. 2002; 162, 323–328.

[8] Shaikh S, Mal G, Khalid S, Baloch GH, Akbar Y. Frequency of hyponatraemia and its influence on liver cirrhosis-related complications. JPMA. 2010; 60:116.