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STUDY OF PROGNOSTIC VALUE IN CIRRHOSIS OF LIVER WITH HYPONATREMIA IN ROHALKHAND REGION.

General Medicine

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ABSTRACT

Aims-To evaluate the association between the serum sodium level and severity of complication in cirrhosis and its prognostic significance.
Methods:-Data of 100 patients in rohalkhand region with cirrhosis were collected prospectively
Observations and Results:- 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). 92(46%) belong to the group of serum sodium concentrations ≥136 meq/L. While, 68(34%) and 40(20%) patients were belong to serum sodium concentration group of ≤130 meq/L and 131-135 meq/L respectively. 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, 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. 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. Mortality found to be 12 %
Conclusion :- The prevalence of hyponatremia in this study was more than 50% and mortality was 12%. Severity of hyponatremia was associated high frequency of complications of cirrhosis, which was a significant association between dilutional hyponatremia and hepatic encephalopathy, hepatorenal syndrome. There was no significant association between hyponatremia and ascites, Coagulopathy, variceal bleeding.

KEYWORDS

1. AIM AND METHOD

Introduction:
Hyponatremia is a common electrolyte abnormality in cirrhosis of liver, as a result of high serum level of renin/aldosterone due to portal hypertension, a decreased vascular response to vasoactive drugs and reduced solute free water clearance. Low serum sodium concentration is an independent predictor of mortality in patients of cirrhosis, but prevalence and clinical signification is unclear. Sever studies have shown serum sodium level correlate with survival in cirrhotic patients. Little is known regarding the relationship between the degree of hyponatremia[1] and development in cirrhosis and evaluate the association between the severity of complication and serum sodium level in cirrhosis and its prognostic significance.

Aim- To 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
- 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 20% 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).

Table 1:-Demographic details-

SR.No	COMPLICATION	≤130 meq/L (n = 68)	131-135 meq/L(n =40)	≥136 meq/L (n = 92)	P value
1.	**Age**(years) (Mean + SD)	47.38+11.34	48.67+10.68	42.89+8.780	0.7706
2.	**Sex:** (Number) (%) **M F**	58(85%) 10(15%)	34(85%) 6(15%)	76(83%) 16(17%)	0.9401*
3.	**Cause of cirrhosis:** (Number)(%)				
	Alcohol: HBV : HCV: Other:	64(76%) 2(4%) 8(20%) 0(0)	40(76%) 2(8%) 4(16%) 0(0)	92(92%) 4(4%) 4(4%) 0(0)	0.0552*
4.	**MELD score** (Mean ± SD)	26.09±7.029	27.00±9.845	18.06±4.961	< 0.0001
5.	**Child-Pugh score**	10.3+1.7	8.9+ 1.9	7.4+1.8	<0.0001*
6.	**Child-Pugh class Class A Class B Class C**	1 26 41	2 18 20	26 46 20	< 0.0001

Patients were classified according to level of serum sodium, 92(46%) belong to the group of serum sodium concentrations ≥136 meq/L. While, 68(34%) and 40(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 47.38+11.34, 48.67+10.68 and 42.89+8.780 respectively,

which were comparable and no statistical difference was found in these three groups (p value=0.7706)

Table 2:-FREQUENCY OF COMPLICATIONS BY SERUM SODIUM CONCENTRATION[4]

Sr. No	COMPLICATION	≤130 meq/L (n = 68)	131 - 135 meq/L (n = 40)	≥136 meq/L (n = 92)	P value
1	Ascitis	68 (100 %)	40 (100 %)	86 (94 %)	0.0621
2	Portal Hypertension	68 (100 %)	40 (100 %)	73 (80.4 %)	0.0111
3	Hepatic Encephalopathy	39 (59 %)	20 (50 %)	8(8.7 %)	< 0.0001
4	GI Bleeding	22(32 %)	9(22 %)	18 (20.2)	0.6904
5	Coagulopathy	8 (12.1 %)	4 (10%)	6 (6.5 %)	0.7094
6	Hepatorenal Syndrome	12 (17.6 %)	6 (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.

Graph 1:-FREQUENCY OF COMPLICATIONS BY SERUM SODIUM CONCENTRATION

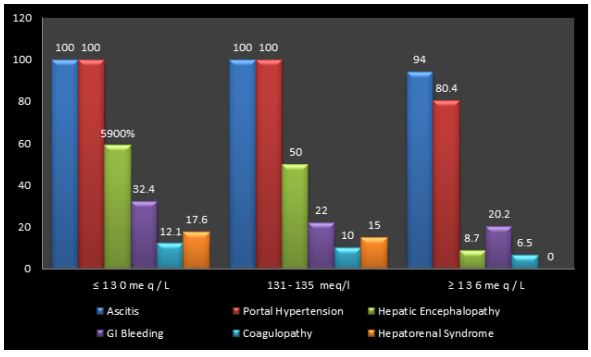


Table 3:- COMPARISON OF COMPLICATIONS ACCORDING TO SERUM SODIUM[5]

Sr.No	COMPLICATION	≤130 meq/L(n = 68)	≤130 meq/L (n = 68)	131-135 meq/L(n=40)	
		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).

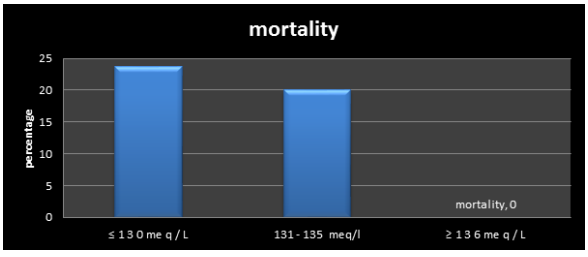
Patients with a serum sodium 131-135 meq/L, as compared with serum sodium ≥136 meq/L had a significantly increased risk for developing complications: 19.5 (95% CI=4.92 to 77.3, p=< 0.0001) for hepatic encephalopathy and 18.6 (95% CI=0.91 to 379.0, p=0.0249) for hepatorenal syndrome[7]. However no statistical 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).

Table 4:- MORTALITY ACCORDING TO SERUM SODIUM CONCENTRATION[8]

	≤130 meq/L (n =68)	131-135 meq/L(n=40)	≥136 meq/L (n = 92)	P value
MORTALITY	16(23.5%)	8(20%)	0(0%)	0.0037

15(23.5%) patients died in group of serum sodium levels ≤130 meq/L, while 8(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.

Graph 2:- MORTALITY ACCORDING TO SERUM SODIUM CONCENTRATION



3. CONCLUSION

The prevalence of hyponatremia in this study was more than 50%.

- 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.

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