

# Hyponatremia with Portosystemic Encephalopathy

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## ABSTRACT

**Aim:** To study hyponatremia with portosystemic encephalopathy (PSE).

**Study Design:** Cross sectional study

**Place of study:** Department of gastroenterology Hayatabad medical complex, Peshawar

**Methodology:** This was a cross sectional study that was done in Department of gastroenterology Hayatabad Medical Complex, Peshawar after approval from the hospital ethical committee. Total of 420 patients with Portosystemic Encephalopathy (PSE) were included.

**Results:** Out of 420 cases, 252 cases were males and 168 were females. Mean± SD of age was 61±0.22 and Mean ± SD of serum sodium level was 126±0.19. 178 patients were having sodium level between 120--125mmol/l i.e. severe hyponatremia (Grade III and IV Portosystemic encephalopathy). Patients having sodium level between 126--130mmol/l were 212 (Grade II and III portosystemic encephalopathy).

**Conclusion:** Hyponatremia was frequently found in patients with portosystemic encephalopathy and sodium levels were inversely related to the grades of portosystemic encephalopathy i.e. patients having severe hyponatremia i.e. <125mmol/l were in higher Grades of encephalopathy i.e. Grade III and IV and vice versa.

**Keywords:** portosystemic encephalopathy, Hyponatremia, chronic liver disease

## INTRODUCTION

Portosystemic encephalopathy (PSE) also called Hepatic encephalopathy is a syndrome of altered mentation due to liver failure. It has features from mild mood or personality changes to drowsiness and coma<sup>1,2</sup>. PSE is due to the shunting of portal blood to the systemic circulation bypassing the liver and unable the liver to detoxify wastes like ammonia<sup>3</sup>. Several conditions are found to be related to precipitate portosystemic encephalopathy e.g. infections, variceal bleeding, drugs, hypokalemia etc. An important is the serum sodium level which is frequently seen in liver disease patient. Hyponatremia may be due to dysregulation of hormones like aldosterone, oxytocin and also due to abnormalities in renal vessels because of liver impairment<sup>4,5</sup>.

## METHODOLOGY

This cross-sectional study was conducted at Department of Gastroenterology, Hayatabad Medical Complex Peshawar after approval from hospital ethical committee for a duration of 06 months. Sampling was done through non probability consecutive sampling from 420 patients using WHO calculator with margin of error of 5% and confidence interval of 95%. All patients of age >18 years with portosystemic encephalopathy (PSE) were included in the study. Detailed history and thorough physical assessment was performed. The diagnosis of portosystemic encephalopathy (PSE) was made by clinical examination of the patients and graded according to West Haven Grading of Hepatic encephalopathy. Patients with other comorbidities like renal impairment, diabetes, hypertension, SBP and fulminant hepatic failure and on diuretics were not included in the study.

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## RESULTS

The detail of results is given in tables 1, 2, 3, 4

Table 1: Gender Distribution

Gender	n=	%age
Male	252	60
Female	168	40
Total	420	100

Table 2: Age Distribution

Age(Yrs)	n=	%age
18 - 40	39	9.3%
41 - 60	226	53.8%
61 - 80	155	36.9%
Total	420	100%

Mean Age= 61 ± 0.22

Table 3: Serum Sodium Level

S. Sodium (mmol/L)	n=	%age
120-125	178	42.4
126-130	212	50.5
131-135	30	7.1
Total	420	100

Mean±SD sodium level = 126 ± 0.19

Table 4: Correlation of porto systemic encephalopathy with serum sodium level

S. Sodium (mmol/L)	PSE Grades				Total
	I	II	III	IV	
120-125	0	0	142	36	178
126-130	0	164	48	0	212
131-135	26	4	0	0	30
Total	26	168	190	36	420

P value = 0.002

## DISCUSSION

In our study, patients having age 40 years or less were 9.3%, while patients with age 41 to 60 years were 53.8%

and >60 years were 36.9% i.e., patients >40 years of age were more than 90%. This shows that advancing age has a role in the development of Portosystemic encephalopathy. This may be due to the chronicity of the disease as well as due to the decline in the body resistance with advancing age. This study showed the inverse relation of severity of portosystemic encephalopathy with serum sodium level i.e. with the fall in serum sodium level contributed to the West Haven grades of hepatic encephalopathy. Patients with serum sodium >130mmol/l was only 7.1% (Grade I). 50.5% (212 patients) of Portosystemic encephalopathy patients were having serum sodium between 126 to 130mmol/l, (among these 77% in Grade II and 23% in Grade III hepatic encephalopathy). 20% of the total 178 patients with serum sodium 125mmol/l or less were having Grade IV encephalopathy while the rest were in Grade III encephalopathy with none in Grade II and I. Similar findings were observed in several other studies<sup>6,7</sup>. The same relation of serum sodium level has been observed with Child Pugh score<sup>8</sup>.

A study also showed three years survival in patients with cirrhosis was greater in those having serum sodium less than 130mmol/l as compared to those having serum sodium above 130mmol/l<sup>9</sup>.

## CONCLUSION

Hyponatremia was frequently found in patients with portosystemic encephalopathy and sodium levels were inversely related to the grades of portosystemic encephalopathy i.e. patients having severe hyponatremia

i.e., <125mmol/l were in higher Grades of encephalopathy i.e., Grade III and IV and vice versa.

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