

Clinical and Biochemical Factors of Portosystemic Encephalopathy in Cirrhosis

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ABSTRACT

Aim: Responsible factors in patients with portosystemic encephalopathy and their relation with the severity of encephalopathy using “west haven scoring”.

Methods: This cross-sectional study was done in the Gastroenterology Department, Hayatabad Medical Complex Peshawar. After ethical approval, a sample of 500 patients was calculated by universally accepted sample calculators. 95% confidence intervals and 5% margin of error. The sample was taken by a non-probability consecutive sampling technique.

Results: Out of 500 patients, 307 were male and 193 females. The mean age was 57.36(±17.65 SD). Electrolyte imbalance (79.2%) was the most prevalent responsible factor, followed by infection (47.4%) and dehydration (24.4%). The number of patients with Grade 1, 2, 3 and 4 encephalopathy were 48, 187, 223, 42 respectively. In the majority of patients with encephalopathy, more than one responsible factor was present.

Conclusion: Portosystemic encephalopathy is one of the most serious and life-threatening complications of liver failure and cirrhosis.

Keywords: Portosystemic encephalopathy, responsible factors, gastrointestinal bleeding.

INTRODUCTION

Portosystemic encephalopathy is CNS dysfunction due to liver failure or portosystemic shunting in the absence of anatomical brain defect¹. The reason for this dysfunction is that the toxic wastes produced in different metabolic processes, like ammonia etc.; are not detoxified in the liver and thus accumulating in the body causing CNS dysfunction². The hallmark features of portosystemic encephalopathy are personality changes, memory, sleep and cognitive changes and change of conscious level. These changes are graded by West Haven Grading System into four grades (grade1 to 4). Sometimes subclinical or minimal encephalopathy is graded as Grade zero^{3,4}.

METHODOLOGY

Cross sectional study done in Gastroenterology Deptt. Hayatabad Medical Complex, Peshawar between December, 2018 and September, 2021 after permission from IRB. 500 cirrhotic patients with portosystemic encephalopathy >12 years were included with non probability consecutive sampling. Diagnosis was done on clinical features. Cases with other causes of encephalopathy like structural brain disease, stroke, trauma or tumor were excluded.

Investigations like serum electrolytes, LFT, RFT, prothrombin time (PT) and INR were done. Urine and blood culture in patients with features of infection was done. UGS abdomen was done for free fluid in the peritoneal cavity and diagnostic ascitic tap was done. Chest x-ray was also done. CT brain was done in suspected patients to exclude anatomical brain damage. Patients were graded according to the severity on the basis of West Haven Criteria as,

Grade 1: Mild mood and sleep changes, irritability, mental sluggishness.

Grade 2: Marked mood changes, drowsiness, asterixis, marked behavioral changes, markedly decreased mentation, mild disorientation.

Grade 3: Somnolence but arousable, marked confusion, severely intellectual disability, severe disorientation in time, place and person.

Grade 4: coma.

The data collected were entered into SPSS-22 and analyzed.

RESULTS

Table 1: Gender distribution

Gender	n	%age
Male	307	61.4
Female	193	38.6
Total	500	100

Table 2: Age distribution

Age(Yrs)	n	%age	Mean age (Yrs)	SD	Std Error of Mean
13 – 40	62	12.4	57.36	17.65	0.79
41 – 60	226	45.2			
> 60	212	42.4			
Total	500	100			

Table 3: Factors of hepatic encephalopathy

Responsible factors	n	%age
Electrolyte Imbalance	396	79.2
Infection	237	47.4
Dehydration	122	24.4
Constipation	58	11.6
G.I Bleed	31	6.2
Sedatives	10	2.0
Unknown	58	11.6

Table 4: Factors with grades of portosystemic encephalopathy

Responsible factors	Grades of portosystemic encephalopathy				
	Grade 1	Grade 2	Grade 3	Grade 4	Total
Electrolyte Imbalance	33(8.3%)	136(34.3%)	192(48.5%)	35(8.84%)	396(100%)
Infection	3(1.3%)	8(3.4%)	193(81.4%)	33(13.9%)	237(100%)
Dehydration	10(8.2%)	56(45.9%)	45(36.9%)	11(9.0%)	122(100%)
Constipation	9(15.5%)	35(60.4%)	9(15.5%)	5(8.6%)	58(100%)
G.I Bleed	0	0	31(100%)	0	31(100%)
Sedatives	0	1(10%)	3(30%)	6(60%)	10(100%)
Unknown	8(13.8%)	49(84.5%)	1(1.7%)	0	58(100%)
Total	48	187	223	42	500

DISCUSSION

In the current study, different factors that precipitate portosystemic encephalopathy in cases with liver cirrhosis were studied. In majority of the patients (88.4%) specific responsible factor, one or multiple, was found. However, in some patients (11.6%) no identifiable responsible factor was found. This may be due to many other factors like old age, malnutrition and micronutrients or vitamin deficiencies, some unnoticed hypoglycemia event, microvascular brain injuries etc. that might have caused the event. In our study, the most prevalent responsible factor was electrolyte imbalance namely hyponatremia and hypokalemia (79.2%). This is well established fact that both of these electrolytes abnormalities are highly prevalent in patients with liver cirrhosis secondary to multiple processes triggered by chronic liver disease [5]. Other common factor in the study was infection i.e. 47.4% and dehydration (24.4%) and constipation (11.6%). While comparing it with the local data, one of the similar study done on the similar population group but in a different institute showed comparable results⁶. Another study done on similar topic in Agha Khan University Hospital Karachi including 404 patients with portosystemic encephalopathy, showed the infection (UTI and SBP) as the most common responsible factor (35.9%) followed by constipation (18.3%)⁷.

Comparing our study with the regional data, a study done in India⁸ including 103 patients with portosystemic encephalopathy showed dehydration as the most common factor (78.6%), followed by electrolyte imbalance including hypokalemia (35.3%) and hyponatremia (26.5%), infections (56.5%), constipation (33%) and Gastrointestinal bleeding (30%). Another study⁹ including 132 patients showed infection as common factor (49.2%), electrolytes imbalance i.e. 41%, and constipation (33.3%).

In another study¹⁰, diuretic therapy is common factor i.e. 27.2%, infections (21.6%), and upper GI bleeding (17.3%). Comparing all these studies with our study it can be concluded that electrolytes imbalance and infection are the most important cause of portosystemic encephalopathy in liver cirrhosis cases.

In our study, cases with use of sedative (60%) were in grade-4 encephalopathy because they have direct CNS depressant effect. In patients with infection (SBP, UTI, RTI) as a responsible factor, 13.9% were in grade 4 while 81.4% were in grade 3 encephalopathy. In our study, cases with grade-4 encephalopathy were having many factors but while many cases of

encephalopathy grade-3 having >1 factor for portosystemic encephalopathy.

CONCLUSION

Portosystemic encephalopathy is one of the most serious health issues in patients with liver cirrhosis having a huge impact on morbidity, mortality and health related cost. This can be avoided by preventing, early identification and prompt treatment of the responsible factors of the condition.

Conflict of interest: Nil

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