

Immediate Prognosis of Hepatic Encephalopathy in a Tertiary Hospital

Mst. Wahida Pervin^{1*}, Md. Roushan Kabir Choudhury², Md. Rokib Sadi³, Dr. Ashoke Sarker⁴

¹Consultant, Department of Medicine, Upazila Health Complex, Durgapur, Rajshahi, Bangladesh

²Consultant, Department of Medicine, Rajshahi Medical College Hospital, Rajshahi, Bangladesh

³Resident Physician (RP), Department of Medicine, Rajshahi Medical College Hospital, Rajshahi, Bangladesh

⁴Assistant Professor, Department of Medicine, Rajshahi Medical College, Rajshahi, Bangladesh

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*Corresponding Author: Dr. Mst. Wahida Pervin

Consultant, Department of Medicine, Upazila Health Complex, Durgapur, Rajshahi, Bangladesh

Abstract

Background: Hepatic encephalopathy (HE) is a significant neuropsychiatric complication of liver disease, causing substantial global morbidity and mortality. Advances in our understanding of HE pathogenesis have led to the development of new management strategies. Documenting the disease profile, precipitating factors, and prognostic indicators is crucial, given the need to widely apply these new strategies. **Objectives:** This study aims to assess the immediate prognosis, identify presenting features, and categorize patients based on the Child-Pugh Class at Rajshahi Medical College Hospital. **Materials and Methods:** This cross-sectional descriptive study conducted in the Department of Medicine at Rajshahi Medical College Hospital from January to December 2010 aimed to assess the immediate prognosis of HE, determine its presenting features, and categorize study subjects based on the Child-Pugh Class. Sixty-six patients with chronic liver disease and HE were included in the study. Comprehensive data were collected through detailed history-taking, physical examinations, and investigations that adhered to the inclusion criteria. **Results:** The study cohort included 42 male and 24 female patients, with the majority (69.7%) falling within the age group of 30-60 years, with a mean age of 47.29 (± 13.5). Most patients presented with grade II HE (40.9%). Hepatitis B, C, or both were positive in 63.6% of cases. Confusion was the most common presenting feature due to encephalopathy (53.0%). A majority of patients (62%) were in Child Class C. Electrolyte imbalance (54.4%), and constipation (34.8%) were the most common precipitating factors. 74.2% of patients survived, while 25.8% succumbed to the condition. **Conclusion:** Hepatic encephalopathy is a well-recognized complication of chronic liver disease, predominantly presenting with mental confusion. Despite many patients presenting with severe encephalopathy (Child Class C), the immediate survival rate was deemed satisfactory. The study underscores the importance of early hospitalization, identification of precipitating factors, and timely treatment in improving outcomes for this fatal condition.

Keywords: Hepatic Encephalopathy, Liver Disease, Prognosis, Etiology, Child-Pugh Classification.

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INTRODUCTION

Liver diseases are a significant global public health concern, affecting millions daily [1]. While liver diseases are prevalent worldwide, the impact is particularly severe in developing countries due to factors such as poverty, poor hygienic conditions, inadequate education, and limited access to healthcare [2]. Chronic liver diseases, including cirrhosis of the liver and its associated complications, pose a substantial challenge to the healthcare system and the overall health economy in these regions [3]. The rising number of cirrhotic patients and their admission to medical wards with various complications highlight the urgency of addressing this issue [4]. Hepatic encephalopathy (HE) is one of the

complex and challenging complications of advanced liver disease. It occurs in a significant percentage of patients with cirrhosis and can also be associated with transjugular intrahepatic portosystemic shunts (TIPS) [5]. Additionally, minimal hepatic encephalopathy affects a substantial portion of patients with liver disease [6]. HE is characterized by neuropsychiatric symptoms with a fluctuating course, typically occurring in the context of end-stage liver failure [7].

The severity of HE is graded from 0 to IV, with symptoms ranging from subtle personality or sleep disturbances to confusion and coma [8]. Grade III or IV HE represents severe HE, characterized by gross disorientation, bizarre behavior, stupor, or coma.

Without liver transplantation, severe HE is often associated with a poor prognosis, with high mortality rates observed within one to three years, as reported in some case series [9]. Furthermore, a significant proportion of patients on liver transplant waiting lists do not survive to receive an organ [10]. It is important to note that this study does not cover the encephalopathy associated with fulminant hepatic failure (FHF), which represents a distinct clinical entity with its own set of challenges and outcomes [11].

Several studies have shed light on the factors that precipitate HE. For instance, research from Pakistan identified infection, gastrointestinal bleeding, and constipation as the most common precipitating factors for HE [12]. Drug usage with ammonium salts, tranquilizers, and large-volume paracetamol were found to be less common factors. Other prevalent associations included ascites, Child's class C, hyponatremia, low hemoglobin levels, hepatitis C infection, and a high mortality rate. Studies conducted in the United States have shown that the apparent cause of HE and the grade of coma at admission is associated with patient outcomes [13]. While liver transplantation may improve survival for some patients, it is often not available or necessary for the majority. In one study, the overall patient survival at three weeks was reported to be 67%, with 30% of patients succumbing to the condition [14]. Notably, all cirrhotic patients who died were classified as Child's class C.

Hepatic encephalopathy remains a well-recognized and frequently encountered complication of hepatic insufficiency [15]. Many patients with HE are admitted to hospitals, and given the severity of the condition, it is crucial to promptly identify its presence and precipitating factors and initiate appropriate treatment. The term "immediate prognosis" or its time frame is not defined in the literature; however, in this study, patients are evaluated on admission, at one week, or on the day of discharge. While the impact of HE on liver disease patients is significant, research on the immediate prognosis of hepatic encephalopathy in hospitalized patients has been notably lacking in Bangladesh. This study aims to fill this gap by investigating the immediate prognosis of hepatic encephalopathy in Rajshahi Medical College Hospital patients. Understanding the immediate prognosis of this condition is essential for optimizing patient care and outcomes in a region where liver diseases are a significant health concern. In the following sections, we will delve deeper into this study's methodology, results, and conclusions, shedding light on the factors influencing the immediate prognosis of hepatic encephalopathy in a tertiary hospital setting.

OBJECTIVES

General Objective:

- To comprehensively study hepatic encephalopathy, understand its impact, and enhance patient care.

Specific Objectives:

- To identify and document the specific clinical and neurological symptoms that patients with hepatic encephalopathy present upon hospital admission.
- To analyze the relationship between the underlying etiology of hepatic encephalopathy and the short-term prognosis of hospitalized patients.
- To categorize and classify the study subjects into different Child-Pugh classes, enabling a better understanding of the severity of their liver disease and its implications for hepatic encephalopathy.

MATERIAL AND METHODS

Study Design

This descriptive cross-sectional study, conducted from January to December 2010 at Rajshahi Medical College Hospital, aimed to assess the immediate prognosis of hepatic encephalopathy. The study included 66 patients with chronic liver disease and hepatic encephalopathy, utilizing structured questionnaires, clinical history, and examinations to collect data.

Inclusion Criteria

- Patients diagnosed with established chronic liver disease exhibiting hepatic encephalopathy as per the West Haven criteria.
- Patients who provided informed consent to participate in the study.

Exclusion Criteria

- Patients with liver disease who did not present with encephalopathy.
- Individuals with acute confusional states resulting from other causes such as hypoglycemia, subdural hematoma, or those with focal neurological signs.
- Patients suffering from acute hepatic failure.

Data Collection

Data collection involved structured questionnaires, comprehensive clinical history-taking, and physical examinations of 66 patients with chronic liver disease and hepatic encephalopathy. Patient histories included inquiries about fever, gastrointestinal bleeding, constipation, diet, surgery, and medication usage, with a specific focus on diuretics, sedatives, nonsteroidal anti-inflammatory drugs, and cough syrups. Past medical histories of jaundice, bleeding, edema, and encephalopathy were recorded. Physical examinations assessed jaundice, anemia, fever, fetor hepaticus,

asterixis, hemodynamic status, dehydration, peripheral edema, and ascites. Encephalopathy severity was graded using the West Haven Criteria.

Data Analysis

The collected data was comprehensively analyzed using Statistical Package for the Social Sciences (SPSS) version 26. This robust statistical software facilitated the examination and interpretation various factors related to hepatic encephalopathy, ensuring rigorous statistical analysis and meaningful results. Descriptive statistics were employed to summarize patient characteristics, including age, gender, and clinical features. Inferential statistics, such as chi-square tests, t-tests, and regression analysis, were utilized to investigate relationships between variables, assess prognostic factors, and determine the impact of etiology on prognosis. The Child-Pugh scores were calculated based on laboratory parameters, aiding in classifying patients according to disease severity. The SPSS software provided valuable insights into the immediate prognosis of hepatic encephalopathy among the study subjects, enhancing the study's validity and reliability.

Follow-up

Patients were closely monitored through daily history-taking and clinical examinations. Follow-up investigations, such as monitoring blood glucose levels

(RBS), prothrombin time (PT), and serum electrolyte levels, were performed bi-weekly or upon discharge if the hospital stay was less than one week. The clinical condition of patients was assessed upon admission, at one week, or upon discharge (if the hospital stay was less than one week).

Ethical Considerations

Before inclusion in the study, each patient's eligibility was assessed, and informed consent was obtained from responsible family members. Patients were provided with detailed information about the study's procedures and objectives, with an assurance of no harm resulting from participation. Patients were informed of their right to refuse participation or withdraw at any time without compromising their care or well-being. Ethical considerations were paramount in ensuring patient safety and consent.

RESULTS

This study aimed to evaluate the short-term outcomes of hospitalized patients with hepatic encephalopathy related to chronic liver disease. The study included 66 participants, excluding those with fulminant hepatic failure. The research focused on assessing the immediate prognosis of hepatic encephalopathy in this patient population.

Table 1: Age and Sex Distribution Among the Study Population

Variable	No. of Patients	% of Patients
Age Group		
11-20	1	1.52%
21-30	6	9.09%
31-40	19	28.79%
41-50	14	21.21%
51-60	13	19.70%
61-70	12	18.18%
71-80	1	1.52%
Gender		
Male	42	63.64
Female	24	36.36

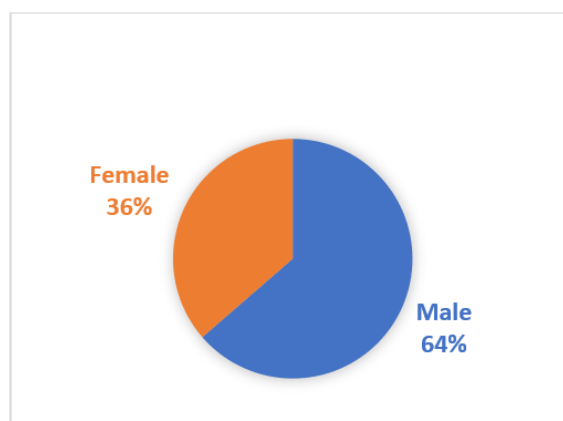


Figure 1: Gender Distributions in the Study Population

The age and sex distribution of the study population across age brackets, with the 31-40 group being the largest at 28.79%. Additionally, it highlights

the gender distribution, with 63.64% male and 36.36% female, providing valuable insights for healthcare and research purposes.

Table 2: Presenting Features of Hepatic Encephalopathy Among the Study Population

Presenting Feature	No. of Patients	% of Patients
Confusion	35	53.0%
Aggressive Behavior	29	43.9%
Poor Concentration	27	40.9%
Sleep Disturbance	18	27.3%
Drowsiness	16	24.2%
Slurred Speech	15	22.7%
Coma	11	16.7%

Patients with hepatic encephalopathy exhibited various presenting features, with confusion being the most common (53.0%), followed by aggressive behavior (43.9%) and poor concentration (40.9%). Other

symptoms included sleep disturbance (27.3%), drowsiness (24.2%), slurred speech (22.7%), and coma (16.7%).

Table 3: Distribution of Grades of Hepatic Encephalopathy Among the Study Population

Encephalopathy Grade	No. of Patients	% of Patients
Grade I	12	18.2%
Grade II	27	40.9%
Grade III	16	24.2%
Grade IV	11	16.7%

The study categorized hepatic encephalopathy into different grades based on the West Haven criteria. Grade II was the most common (40.9%), followed by

Grade III (24.2%), Grade I (18.2%), and Grade IV (16.7%). This classification helps assess the severity of the condition in patients.

Table 4: Categorization of Patients According to Child-Pugh Class

Child Class	No. of Patients	% of Patients
Class A	8	21.1%
Class B	17	25.8%
Class C	41	62.1%

The study classified patients with hepatic encephalopathy based on the Child-Pugh classification. Class C was the most prevalent (62.1%), followed by

Class B (25.8%) and Class A (21.1%). This classification helps determine the severity of liver disease and prognosis in patients.

Table 5: Precipitating Factors of Hepatic Encephalopathy

Precipitating Factor	No. of Patients	% of Patients
Electrolyte Imbalance	36	54.4%
Hypokalaemia	4	6.1%
Hyponatraemia	3	4.5%
Constipation	23	34.8%
Gastrointestinal Bleeding (GIB)	2	3.0%

This table shows the various precipitating factors associated with hepatic encephalopathy in the study population. The most common factor was an electrolyte imbalance, affecting 54.4% of patients, with hypokalaemia (6.1%) and hyponatremia (4.5%) as subcategories. Constipation was another significant

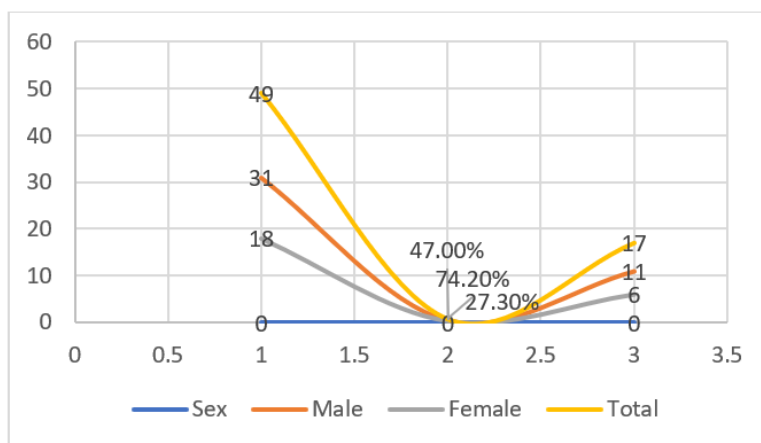
factor, impacting 34.8% of patients, potentially due to a lack of consistent use of lactulose. Gastrointestinal bleeding (GIB) was relatively less common, affecting only 3.0% of patients. Properly managing these precipitating factors is crucial in preventing and managing hepatic encephalopathy.

Table 6: Duration of Hospital Stay Among the Study Population

Hospital Stay	No. of Patients	% of Patients
<3 days	12	18.2%
3-7 days	49	74.2%
>7 days	5	7.6%

The table presents the duration of hospital stays for patients with hepatic encephalopathy. Most patients (74.2%) were hospitalized for 3-7 days, while a smaller proportion (18.2%) had stays of less than 3 days, and a

few (7.6%) were hospitalized for more than 7 days. This information highlights the typical length of hospitalization for such patients.

**Figure 2: Prognosis Among Different Sex Groups**

Shows survival rates among male and female patients. Among males, 47% survived, and among females, 27.3% survived. Overall, 74.2% of patients

survived, with males having a higher survival rate than females.

Table 7: Relation of Outcome with Encephalopathy Grading

Encephalopathy Grade	Death	Survived	Total	% of Patients
Grade I	0	12	12	18.18%
Grade II	4	23	27	40.91%
Grade III	6	10	16	24.24%
Grade IV	7	4	11	16.67%
Chi-Square (χ^2)=15.261, P-Value=0.002				

The table shows a strong association between the severity of hepatic encephalopathy and patient outcomes. Grade I had a 100% survival rate, while Grade IV had a 63.64% mortality rate. The Chi-Square (χ^2) statistic of 15.261 with a P-value of 0.002 confirms the statistical significance of this relationship, emphasizing the importance of tailoring treatments based on encephalopathy grade. Examines the relationship between the presenting features of hepatic encephalopathy and the prognosis of patients. It shows that patients admitted with confusion had the highest mortality rate (15.2%), followed by those with drowsiness (12.1%) and coma (10.6%). Patients with poor concentration had a lower mortality rate (3%), while none of those with sleep disturbance died. The table also includes p-values indicating the statistical significance of these relationships.

DISCUSSION

Hepatic encephalopathy, a well-recognized complication of cirrhosis, demands timely identification and intervention. This study, involving 66 patients with hepatic encephalopathy at Rajshahi Medical College Hospital, aimed to unravel the clinical features, etiology, precipitating factors, and outcomes associated with this condition. Our findings revealed significant insights into this complex medical challenge. Age distribution among our patient cohort indicated that the majority (69.7%) fell within the 30-60 years age group, a pattern consistent with previous studies [16]. Notably, a male predominance was observed, with a male-to-female ratio of 1.7:1, reflecting societal gender biases in healthcare-seeking behaviors. This gender disparity, in contrast to Western countries where alcoholism predominantly drives cirrhosis (with a male preponderance of 77:33), underscores the need for gender-sensitive healthcare practices [17].

The presenting features of hepatic encephalopathy exhibited distinct characteristics, with confusion (53%), aggressive behavior (43.9%), and poor concentration (40.9%) being the most prevalent symptoms. Most patients were categorized as grade II (40.9%) on the encephalopathy severity scale, differing from the findings of Alam *et al.*, who reported a majority in grade IV [18]. Additionally, non-specific general symptoms, jaundice, ascites, and leg swelling were common clinical features attributed to cirrhosis. Child-Pugh classification revealed that a significant proportion (62%) of our patients were in Child Class C, indicative of advanced liver disease. Conversely, only 12.1% were classified as Child Class A, possibly due to delayed healthcare seeking and limited awareness. These findings mirror Alam *et al.*'s findings, where most were in Child Class C [19].

Laboratory parameters indicated moderate liver function abnormalities, varying serum bilirubin levels, ALT, prothrombin time, and serum albumin. Electrolyte imbalances, affecting 54.4% of patients, were prevalent and often correlated with the severity of cirrhosis. Hyponatremia (28.7%) and hypokalemia (25.7%) were notable manifestations, primarily attributed to diuretic use, paracentesis, and gastrointestinal issues. Gastrointestinal bleeding and infection remained our study's most common precipitating factors, although GI bleeding frequencies were relatively lower than in other studies. HBsAg positivity (51.5%) exceeded HCV antibody positivity (12.1%), contrary to the rising HCV epidemic in Pakistan. These trends deviated from those observed in industrialized Western nations, where alcohol is the primary etiological factor.

The study outcomes highlighted that 74.2% of patients had hospital stays of 3-7 days, with an overall mortality rate of 25.8%. Grade IV encephalopathy had a significantly higher mortality rate (10.6%), and electrolyte imbalance, GI bleeding, and spontaneous bacterial peritonitis were associated with fatalities. Our management protocol did not incorporate newer therapeutic regimens, which may have improved outcomes if employed alongside intensive care units. This study offers valuable insights into hepatic encephalopathy within a resource-constrained setting. The findings emphasize the need for early identification, prompt intervention, and the incorporation of evolving therapeutic strategies. However, limitations such as the absence of liver biopsies and a small sample size should be considered. Further research is warranted to explore the evolving patterns of liver diseases and their impact on hepatic encephalopathy in similar contexts [20].

CONCLUSION

Hepatic encephalopathy (HE), within the context of chronic liver disease, is often triggered by specific factors. Our study identified electrolyte imbalances, particularly hypokalemia and hyponatremia, as the primary culprits behind HE. These imbalances

could stem from excessive diuretic use, as well as complications like diarrhea and vomiting. Therefore, cautious diuretic management and effective treatment of gastrointestinal issues are crucial. Constipation also emerged as a significant contributor, possibly due to inconsistent lactulose use, possibly due to cost or patient preference. The Hepatitis B virus was identified as a prominent cause of chronic liver disease in our study, highlighting the importance of public awareness and affordable vaccination programs. Education on hepatitis virus transmission modes can reduce cirrhosis incidence and related morbidity and mortality. Routine psychometric testing for encephalopathy risk in liver disease patients should be considered, with the provision of intensive care resources in healthcare institutions for comprehensive patient management.

Recommendations

- Launch programs to educate the public about hepatitis transmission and promote affordable vaccination.
- Introduce routine psychometric testing for encephalopathy risk in liver disease patients.
- Improve management of electrolyte imbalances and constipation through cautious diuretic use and prompt treatment of gastrointestinal issues.

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Abbreviations

- HE - Hepatic Encephalopathy
- HBV - Hepatitis B Virus
- HCV - Hepatitis C Virus
- ALT - Alanine Aminotransferase
- PT - Prothrombin Time
- GI – Gastrointestinal

Article at a Glance

Study Purpose: To evaluate immediate prognosis, presenting features, and Child-Pugh classification in hospitalized hepatic encephalopathy patients.

Key Findings: Electrolyte imbalances and constipation were common precipitating factors. Hepatitis B was a significant cause of liver disease. Most patients were in advanced Child-Pugh Class C.

Newer Findings: Emphasizes the importance of addressing specific precipitating factors, highlights

hepatitis B prevalence, and recommends routine psychometric testing for encephalopathy risk in liver disease patients.

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