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Original Research Article

RISK FACTORS OF HEPATIC ENCEPHALOPATHY IN PATIENTS WITH CHRONIC LIVER DISEASE PRESENTING TO SAIDU GROUP OF TEACHING HOSPITAL, SWAT

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ABSTRACT

Background: *Hepatic encephalopathy (HE) is a serious complication of chronic liver disease (CLD), characterized by neuropsychiatric impairment that significantly increases morbidity and mortality. Identifying key precipitating risk factors is essential for prevention and timely management.* ***Objective:*** *To determine the key risk factors leading to HE in patients with CLD presenting to Saidu Group of Teaching Hospital, Swat, Pakistan.* ***Study Design:*** *Cross-sectional study.* ***Setting:*** *Department of Medicine, Saidu Group of Teaching Hospital, Swat, Pakistan.* ***Duration of Study:*** *12 July 2024 to 12 January 2025.* ***Methods:*** *A total of 107 patients diagnosed with HE and CLD were enrolled. CLD was confirmed based on clinical features, while HE was diagnosed through neuropsychiatric symptoms and magnetic resonance imaging (MRI) findings. Risk factors, including fever (oral temperature ≥38°C), upper gastrointestinal (GI) bleeding (confirmed by endoscopy), and respiratory tract infections (sputum culture with clinical correlation), were assessed. Data were analyzed using descriptive statistics.* ***Results:*** *The mean age of patients was 49.18 ± 14.59 years. Females constituted 66 (61.7%) and males 41 (38.3%). Among identified risk factors, upper GI bleeding was observed in 52.3% cases, fever in 35.5%, and respiratory tract infections in 12.1%.* ***Conclusion:*** *Upper gastrointestinal bleeding was the most common precipitating factor for HE in patients with CLD, followed by fever and respiratory tract infections. Preventive measures and timely management of these risk factors may reduce the incidence of HE and improve patient outcomes.*

Keywords: Hepatic Encephalopathy, Chronic Liver Disease, Risk Factors, Gastrointestinal Bleeding, Fever, Respiratory Infection, Cirrhosis.

INTRODUCTION

Chronic liver disorders (CLDs) are believed to impact 1.5 billion individuals worldwide, and they claim the lives of two million individuals annually on average (1, 2). According to the Lancet's 2020 report on the global burden of disease, the number of disability-adjusted life years attributed to CLD in 2019 rose by 33.0% over the previous 30 years, accounting up 1.8% of the global burden. These findings indicate that the burden of CLD on public health is increasing (3), most likely as a consequence of the fact that the majority of CLD patients remained stable for a prolonged amount of time without displaying any overt symptoms or early detection indicators. For prognosis to improve and a suitable treatment to begin, early identification of CLD as well as cirrhosis is crucial. Before determining a course of treatment, it is essential to determine the etiology and evaluate the severity of illness. Screening tests for metabolic panels, HBV markers, and HCV markers are usually used to determine etiology. It's also essential to gather and analyze data about drug exposure, including alcohol consumption (4-6).

One of the most crippling side effects of cirrhosis is hepatic encephalopathy (HE), which has an enormous effect on the lives of both patients as well as those who care for them. Patients with hepatic disease and portosystemic shunting can develop a range of reversible mental health conditions, including HE. HE can be classified broadly as either overt or covert. HE and grade 1 HE are considered covert HE, while grades 2-4 are regarded as overt HE. Based on its origin, HE is further divided into three types: type A relates to acute liver failure, type B comprises portosystemic shunts, while type C involves cirrhosis (7-11). Nearly 7 million people in the US are affected by HE, and 150,000 are diagnosed with it yearly. Cirrhosis additionally occurs in about 20% of individuals (12). According to a study, the following risk factors for HE were noted: respiratory tract infection (7.5%), intestinal hemorrhage (29.5%), and fever (35%) (13).

Understanding the interplay of risk factors is crucial for clinicians in predicting, preventing, and managing hepatic encephalopathy in patients with chronic liver disease. Given the scarcity of literature on this subject at the local level, this study aims to identify the risk factors associated with hepatic encephalopathy in patients with chronic liver disease presenting to Saidu Group of Teaching Hospital, Sawat. The results of this study will help our health professionals to understand the valuable insights into the complex mechanisms underlying hepatic encephalopathy, ultimately contributing to more effective preventive strategies and improved patient care. The dynamic nature of risk factors necessitates a personalized approach to patient care, involving meticulous monitoring, early detection, and targeted interventions to mitigate the impact of hepatic encephalopathy on both short-term and long-term outcomes.

METHODOLOGY

This cross-sectional study was conducted in the Department of Medicine at Saidu Group of Teaching Hospital, Swat, following ethical approval from the hospital. The duration was from July 12, 2024, to January 12, 2025. The study population was 107. This sample size was determined using the WHO sample size calculator based on a reported 7.5%13 prevalence of respiratory tract infection as a contributing factor to hepatic encephalopathy with a 95% confidence level and 5% absolute precision. Participants were selected through a consecutive non-probability sampling technique.

All eligible participants provided written consent—patients of both genders aged between 20 and 70 years presenting with chronic liver disease and Hepatic Encephalopathy. CLD was defined as the presence of all the following clinical features: jaundice, abdominal pain (≥5 on the Visual Analog Scale), and peripheral edema in the lower extremities. Diagnosis was confirmed via abdominal ultrasound demonstrating increased hepatic echogenicity, loss of diaphragmatic

visualization, and obscured intrahepatic vasculature. Patients were assessed for Hepatic Encephalopathy (HE), which was diagnosed in patients exhibiting reduced alertness, impaired attention span, and disrupted sleep cycles. MRI findings supporting the diagnosis included at least four of the following: symmetric high signals in the insular cortex, thalamus, posterior limbs of the internal capsule, diffuse cortical edema, and hyperintensity. Pregnant women, individuals with a history of head injury, or those with a history of poisoning were not included.

Three risk factors were assessed, including fever, defined as an oral temperature ≥100.4°F (38°C), measured using a calibrated digital thermometer. Upper Gastrointestinal (GI) Bleeding, diagnosed via esophagogastroduodenoscopy (EGD), with findings of active bleeding, varices, or mucosal erosions, and a respiratory tract infection confirmed by sputum culture, in patients presenting with at least three of the following symptoms: fever, cough, rhinorrhea, sore throat, or nasal congestion.

Data collection involved recording detailed demographic information, including age, gender, education status, occupation, socioeconomic background, and residential location. A thorough medical history and physical examination were conducted for each participant. All clinical evaluations were supervised by an experienced consultant with a minimum of five years post-fellowship experience. Clinical data were recorded in a predesigned proforma to maintain standardization.

SPSS 21 was used for analyzing the data. Age, weight, BMI, and height were calculated using mean and standard deviation. Gender, gender education status, occupation, socioeconomic background, and residential location, along with risk factors, were evaluated with frequency and percentages. Stratification of risk factors with demographics was done using the Chi-Square test, keeping the P value statistically notable at ≤ 0.05.

RESULTS

Our study included 107 patients with a mean age of 49.18±14.59 years. The mean BMI of the participants was 25.04 ± 1.61. In terms of demographics, the majority of participants were female, comprising 66 (61.7%) females, while males accounted for 41 (38.3%). The rest of the demographic distribution can be seen in Table 1.

Regarding risk factors, we observed that fever was reported in 38 (35.5%) cases, upper GI symptoms in 56 (52.3%), and respiratory tract infections in 13 (12.1%) cases (Table 2). These findings highlight the demographic and clinical characteristics of the study population, providing a foundation for further analysis of hepatic encephalopathy risk factors in patients with chronic liver disease. Stratifications can be seen in Table 3.

Table 1: Demographics

Demographics		n	%
Gender	Male	41	38.3%
	Female	66	61.7%
Education	Literate	59	55.1%
	Illiterate	48	44.9%
Profession	Office job	35	32.7%
	Business	48	44.9%
	Other	24	22.4%
Residence	Urban	61	57.0%
	Rural	46	43.0%
Socioeconomic status	Lower class	30	28.0%
	Middle class	58	54.2%
	Upper class	19	17.8%

Table 2: Risk factors

Risk factors	n	%
Fever	38	35.5%
Upper GI	56	52.3%
Respiratory tract infection	13	12.1%

Table 3: Stratification of risk factors with demographics

Demographics		Risk factors						P value
		Fever		Upper GI		Respiratory tract infection		
		n	%	n	%	n	%	
Age groups (Years)	20 to 35	11	28.9%	10	17.9%	3	23.1%	P > 0.05
	36 to 50	7	18.4%	17	30.4%	6	46.2%	
	> 50	20	52.6%	29	51.8%	4	30.8%	
BMI (Kg/m^2)	18 to 25	29	76.3%	41	73.2%	5	38.5%	P < 0.05
	> 25	9	23.7%	15	26.8%	8	61.5%	
Gender	Male	17	44.7%	20	35.7%	4	30.8%	P > 0.05
	Female	21	55.3%	36	64.3%	9	69.2%	
Education	Literate	20	52.6%	35	62.5%	4	30.8%	P > 0.05
	Illiterate	18	47.4%	21	37.5%	9	69.2%	
Profession	Office job	15	39.5%	17	30.4%	3	23.1%	P > 0.05
	Business	14	36.8%	28	50.0%	6	46.2%	
	Other	9	23.7%	11	19.6%	4	30.8%	
Residence	Urban	21	55.3%	34	60.7%	6	46.2%	P > 0.05
	Rural	17	44.7%	22	39.3%	7	53.8%	
Socioeconomic status	Lower class	11	28.9%	16	28.6%	3	23.1%	P > 0.05
	Middle class	21	55.3%	30	53.6%	7	53.8%	
	Upper class	6	15.8%	10	17.9%	3	23.1%	

DISCUSSION

The demographic profile of our study population, with a mean age of 49.18 ± 14.59 years and female predominance (61.7%), presents interesting parallels and contrasts with other studies examining chronic liver disease (CLD) populations. At the same time, our age distribution aligns closely with that of Akhtar et al., who reported a mean age of 48.77 years (14). Similarly, Khan et al. also reported female predominance, and Qazi et al. documented female majority as well (15, 16). In contrast, Mumtaz et al reported a higher number of male patients (17). This variation may reflect regional differences in CLD etiology or healthcare-seeking behaviors between genders.

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Our findings regarding education levels (55.1% literate) and socioeconomic distribution (54.2% middle class) provide valuable context often missing from clinical studies of hepatic encephalopathy. These socioeconomic factors likely influence disease management and outcomes. The urban-rural distribution (57% urban) in our study may relate to healthcare access patterns, as urban residents often have better access to tertiary care facilities for CLD management.

Regarding clinical risk factors, our finding that 52.3% of patients presented with upper GI bleeding symptoms corresponds with Sheikh et al., who documented 56% cases of upper GI bleeding in their cohort (18). Ahmed et al. also documented 56% cases of upper GI bleeding in their study. Fever was present in 35.5% of our participants, which was similar to that of Mahboob et al., who documented fever in 35% of their cases with CLD (13). Akhtar et al. reported infection in approximately 37.17% of patients; the majority of these cases involved individuals over 40 years of age (14). Qazi et al. documented around 36.66% cases of infection in their study on CLD patients (16). Khan et al. documented infection in around 12% cases (15). These variations in infections are possibly reflecting differences in infection classification or local prevalence of infectious complications. The 12.1% prevalence of respiratory tract infections in our cohort aligns well with Mahboob et al., who documented around 7.5% cases of respiratory tract infection in their study (13).

Although not studied in our cohort, mortality in Qazi et al's study was reported in 28.7% cases.[16] Akhtar et al. documented a lower prevalence with 15.4% mortality cases.[14] Khan et al. documented 15.3% cases of mortality (15). Similarly, our study didn't assess constipation or electrolyte imbalances, which were prominent in other studies (15, 16).

These comparisons highlight both consistencies and unique aspects of our findings. The similar age distributions but varying gender ratios across studies suggest that while CLD affects similar age groups globally, gender distribution may be more influenced by local factors. The prominence of upper GI symptoms and fever in our results aligns with their established role as HE precipitants.

CONCLUSION

In conclusion, upper gastrointestinal bleeding was the most prevalent risk factor leading to hepatic encephalopathy in patients with chronic liver disease, followed by fever and respiratory tract infection. The findings underscore the need for targeted interventions such as prophylactic management of variceal bleeding and infection control.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

ABDUL AZIZ (Postgraduate Resident)

Conception of Study, Development of Research Methodology Design, Data Collection, Manuscript Drafting, and Manuscript Revisions.

WASIL KHAN (Professor)

Conception of Study, Critical Input, and Final Approval of Manuscript.

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