

ORIGINAL ARTICLE

HEPATIC ENCEPHALOPATHY IN CHRONIC LIVER DISEASE
PRODUCED BY CHRONIC VIRAL HEPATITIS

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Background: Hepatic encephalopathy (HE) involves neuropsychiatric dysfunction as a result of metabolic disturbance. The objective of the study was to determine and compare grades of hepatic encephalopathy in patients of viral hepatitis B, C, and co-infection. **Methods:** A cross-sectional study was designed which included seventy five patients of chronic HBV, HCV, and co-infection of either sex, aged 35 years or above. The patients were equally divided into 3 groups. Hepatic encephalopathy was classified into four grades based on the West Haven classification. **Results:** Out of the 75 subjects, 51 (68.0%) were males and 24 (32.0%) were females. The Mean age was 44.69 ± 7.423 years. Grade I hepatic encephalopathy was a significant feature of both chronic HCV and co-infection groups. The development of grade II encephalopathy was more marked in chronic HBV group, while grade III encephalopathy was more frequent in chronic HCV group. However, frequency distribution of grade IV encephalopathy remained same in all groups. **Conclusion:** The study concluded that progression of encephalopathy was not more marked in co-infection group. In fact, hepatic encephalopathy equally developed in study groups.

Keywords: Chronic liver disease, Hepatic encephalopathy, viral hepatitis

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INTRODUCTION

Chronic liver disease (CLD) and cirrhosis affect more than 5.5 million people in the United States and hundreds of millions around the world.^{1–4} With small variations, 70–80% of end stage liver diseases are caused by excessive alcohol consumption and by viral hepatitis.⁵

HBV infection constitutes a serious global health problem.⁶ HBV is also a crucial public health problem in Pakistan. It has been classified into eight genotypes (A–H) based on genome sequence divergence. Genotype A was found to be more strongly associated with severe liver disease in Pakistan.⁷

HCV infects approximately 3% of the world's population.⁸ HCV infection becomes chronic in 80% of infected persons resulting in different stages of chronic hepatitis, with 20–30% progressing to cirrhosis within 20 years time.⁹

Co-infection of HCV, HBV, and HIV is common due to shared modes of transmission.¹⁰ The worldwide prevalence of HBV/HCV co-infection is unknown and might be underestimated. The co-infection persons tend to have more severe liver injury, a higher probability of liver cirrhosis and hepatic decompensation, and a higher incidence of hepatocellular carcinoma.¹¹ World Health Organization (WHO) estimated that about 2 billion people globally have already been infected by HBV, approximately 350 million of whom have developed chronic infection, with greatly increased risk of developing hepatic cirrhosis and hepatocellular carcinoma. Estimated annual mortality ranges from 0.5 million to 1.2 million, out of which 0.32 million are caused by CLD.⁵

Hepatic encephalopathy (HE) has an impact on the healthcare system and presents a major challenge for the gastroenterologist, hospitalist, and primary care physician.¹ It is a syndrome of mainly reversible damage of brain function in patients with acute or chronic liver failure.^{12,13} Studies have already clearly indicated that overt hepatic encephalopathy affects 30–45% of patients with hepatic cirrhosis.^{14,15} It involves neuropsychiatric dysfunction as a result of metabolic disturbance caused by marked hepatic injury and porto-systemic venous shunting.¹⁶ The normal function of brain is interrelated with normal functioning of the liver. Liver plays a critical role in providing vital nutrients to the brain but also detoxify the splanchnic blood. Compromised liver function leads to insufficient detoxification thus allowing neurotoxins (such as ammonia, manganese, and other chemicals) to enter the cerebral circulation. Neurologic damage in chronic liver disease and liver cirrhosis seems to be multifactorial.¹⁷ HE impairs normal brain function like anatomical brain integrity, sufficient energy production, and efficient synapse neurotransmission.^{14,18}

The clinical features of HE vary on the basis of its severity. Patients with sub-clinical or minimal HE, present disturbances easily be detected on neuropsychiatric and psychomotor testing. An early manifestation of HE is alteration in the diurnal sleep pattern and is related to altered melatonin secretion. More advanced neurologic features of HE include bradykinesia, asterixis, hyperreflexia, and transient decerebrate posturing. Rarely, The HE may be associated with hemiplegia.⁴ The clinical features in patients of HE may include muscle wasting, jaundice,

ascites, peripheral oedema, spider telangiectasias, palmar erythema, and fetor hepaticus.¹ The objective of the study was to determine and compare grades of hepatic encephalopathy in patients of viral hepatitis B, C, and co-infection.

SUBJECTS AND METHODS

A cross-sectional study was designed which was conducted in the Medical Units of Lahore General Hospital, Lahore. Seventy-five patients of chronic HBV, HCV, and co-infection of either sex, aged 35 years or above were selected and grouped equally. Non-probability-convenience sampling was used for data collection. The subjects with type 2 diabetes mellitus, HIV, alcohol abuse, and with other causes of chronic liver disease were excluded. HE has been classified into four grades based on the West Haven classification¹⁹ (Table-1). Data obtained was first entered in the Microsoft Excel sheet to generate data base which was exported in the SPSS-20. Data was analyzed for description i.e. for categorical variables, frequencies and percentages were calculated.

Table-1: Clinical grading of hepatic encephalopathy

Encephalopathy Grades
Grade I: Poor concentration, slurred speech, slow mentation, disordered sleep rhythm
Grade II: Drowsy but easily arousable, occasional aggressive behaviour.
Grade III: Marked confusion, drowsy, sleepy but responds to pain and voice
Grade IV: Unresponsive to voice, may or may not respond to painful stimuli, unconscious.

RESULTS

In this study, 51 (68.0%) were males and 24 (32.0%) were females. The age of the selected CLD patients ranged from 35 to 65 years while the Mean±SD age was 44.69±7.423 (Table-2).

Table-2: Frequency and age of patients

Disease	Number	Age (Years)
Hepatitis B	25	43.04±6.471
Hepatitis C	25	50.04±8.279
Co-Infection	25	41.00±3.559
Total	75	44.69±7.423

In chronic HBV patients, 5 (20.0%) had grade 1, 7 (28.0%) had grade 2, 5 (20.0%) had grade 3, and 1 (4%) had grade 4 encephalopathy respectively. 7 (28.0%) had no encephalopathy. In chronic HCV patients, 6(24.0%) had grade 1, 5 (20.0%) had grade 2, 6 (24.0%) had grade 3, and 1 (4%) had grade 4 encephalopathy respectively. Seven (28.0%) patients had no encephalopathy. In co-infection patients, 6 (24.0%) had grade 1, 6 (24.0%) had grade 2, 5 (20.0%) had grade 3, and 1 (4%) had grade 4 encephalopathy respectively. Seven (28.0%) had no encephalopathy (Table-3).

Table-3: Hepatic Encephalopathy (Grade I to IV) in Types of Infection [n (%)]

	Grade I	Grade II	Grade III	Grade IV	No encephalopathy
HBV	5 (20)	7 (28)	5 (20)	1 (4)	7 (28)
HCV	6 (24)	5 (20)	6 (24)	1 (4)	7 (28)
Co-infection	6 (24)	6 (24)	5 (20)	1 (4)	7 (28)

DISCUSSION

The liver is a large and complex organ that is well designed for its central role in carbohydrate, protein, and fat metabolism. It is a site where products of metabolism are detoxified through processes such as amino acid deamination, which produces urea. In conjunction with spleen, it is involved in destruction of spent red blood cells and reclamation of its constituents. It is responsible for synthesizing and secreting bile, and synthesizing lipoproteins and plasma proteins including clotting factors.²⁰

Bukhtari, *et al.*, concluded that encephalopathy was present in significantly high number in co-infection patients. The relevant clinical features were also more marked in co-infection patients as compared to patients with single virus infection.²¹ In this study, the progression of hepatic encephalopathy was not more marked in co-infection group as compared to single infection. Grade-I hepatic encephalopathy was a significant feature of both chronic HCV and co-infection groups. The development of Grade-II encephalopathy was more marked in chronic HBV group, while Grade-III encephalopathy was more frequent in chronic HCV group. However, frequency distribution of Grade-IV encephalopathy remained same in all groups. Our results agree with the findings of study which concluded that the liver disease in patients with co-infection is not more severe than in patients with single HBV or HCV infections.²²

CONCLUSION

Progression of encephalopathy was not more marked in co-infection group. In fact, hepatic encephalopathy equally developed in all study groups.

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