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Prevalence of Precipitating Factors of Hepatic Encephalopathy at Nangarhar Regional Hospital

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ABSTRACT

Backgroud: Hepatic encephalopathy (HE) or portosystemic encephalopathy (PSE) is a satiuation of disordered in central nervous system's functions characterrized by the failure of the liver to detoxify noxious substances of gastrointestinal origin due to hepatocellular dysfunction and portosystemic shunting. HE is a complication of chronic liver disease brought on by a number of precipitating circumstances and factors. The aim of this study is to analyze the precipitating factors of HE in cases seen in the Infectious Diseases Ward of Nangarhar Regional Hospital.

Materials and Mehtods: A non-interventional hospital based descriptive study was conducted on 50 HE patients in the Infective Ward of Nangarhar Regional Hospital during May 2021 – December 2021. This study also included patients with liver cirrhosis developing HE, known as acute fulminant hepatitis. A comprehensive questionnaire was developed for a better data collection. Detailed clinical history of the patients were taken regarding the present and past diseases. All patients were carefully examined with special attention to anemia, jaundice, asterixes, fever and ascites. Laboratory examinations that recommended for these diseases were also investigated.

Results: The results revealed that most of the patients were aged between 40 – 70 years old (82%). The highest frequency of HE disease was recorded in the age of 60-69 (42%). There were four classes of patients according to the classification. Majority of the patients were in fourth class (52%), followed by second class (20%), third class (16%) and first class (12%) of hepatic encephalopathy. It is found that the most crucial exacerbating factors were including infections, constipation and gastrointestinal bleeding. Among them, infections were more frequent which were recorded in 22 patients (44%), followed by constipation in 10 patients (20%) and gastrointestinal bleeding in 6 patient (12%). Among the type of infections the urinary tract infections were accounted for 19% followed by gastrointestinal tract infections (16%) and respiratory tract infections (12%).

Conclusion: To determine which precipitating factor is responsible for HE in the eastern region of Afghanistan, frequency of several precipitating factors was examined. Knowing the primary triggering factor makes it simple to develop a plan of action to significantly reduce the incidence of HE. In our investigation, gastrointestinal bleeding, constipations, and infections were the most typical precipitating factors. Due to the fact that hepatitis C is the main and leading cause of liver cirrhosis in Afghanistan.

Keywords: Gastrointestinal bleeding, Hepatic encephalopathy, Infections, Liver cirrhosis, Precipitating factors

INTRODUCTION

Millions of individuals around the world suffer from liver problems. Long-lasting illnesses like liver cirrhosis and its sequela are a significant health issue and a significant economic challenge in developing nations where the cost of healthcare has always been a concern (Lim et al., 2023). The number of cirrhotic patients is growing as a result of poverty, unsanitary living conditions, inadequate education, and a lack of counseling; therefore the majority of them are admitted in hospitals with various difficulties. When there are no other neurological problems present, all neuropsychiatric symptoms in individuals with acute or chronic liver ailments are referred to as suffering hepatic encephalopathy (HE) (Dieperink et al., 2000).

HE, also known as portosystemic encephalopathy (PSE), is a condition of abnormal central nervous system function. It results from the liver's inability to detoxify noxious substances with gastrointestinal origin due to hepatocellular dysfunction and portosystemic shunting (Mumtaz et al., 2010). According to Ong et al. (2003), HE is a synonym for a psychological and neurological condition that results from acute hepatic failure and occurs when the liver is affected by a chronic illness like liver cirrhosis and is combined with aggravating factors like infections, constipation, gastrointestinal bleeding, etc.

In some circumstances, HE can induce neurological issues and even result in death (Hunot & Hirsch, 2003). Acute liver failure, one or more triggering factors in cirrhotic patients, or chronic portal systemic encephalopathy caused by sustained portal systemic shunting are all possible causes of HE (Romero-Gomez et al., 2015). In an otherwise stable cirrhotic patient, common precipitating factors include gastrointestinal bleeding, infections, azotemia, constipation, electrolyte imbalance, high protein diet, drug use (sedatives, tranquilizers, analgesics, and diuretics), fulminant hepatic injury, and large volume paracentesis (Gad, 2012; Mumtaz et al., 2010).

The world health organization (WHO) estimates that liver cirrhosis causes 1.1% of all fatalities that occur globally (Mathers et al., 2009). In the UK, chronic liver disease is the fifth leading cause of death (Sivakrishnan & Pharm, 2019). As cirrhosis rates from alcohol-related liver disease, chronic hepatitis C, and nonalcoholic fatty liver disease grow, so will mortality rates. In Pakistan, it is also a widespread illness that is primarily brought on by the hepatitis C virus, followed by the hepatitis B virus or a combination of both (Maqsood et al., 2006). Additionally, HE is a widespread illness in Afghanistan. Therefore, additional research and studies are required to determine the pathophysiology that will result in new HE therapy choices. However, there is lack of published data and information regarding the prevalence of hepatic encephalopathy in Afghanistan, particularly in the eastern region Nangarhar province. Thus, this is the first study which is conducted to record the frequency and prevalence of hepatic encephalopathy at Nangarhar Regional Hospital. The results of this study will assist relevant organizations to properly manage and take action for the adequate treatment of HE.

MATERIALS AND METHODS

Patients and Methods

A non-interventional (observational) hospital based descriptive study was conducted on 50 HE patients in the infectious diseases ward of Nangarhar Regional Hospital during May 2021 – December 2021. Among the 50 admitted and studied patients presenting or complicating into HE, 38 (77%) were males and 12 (24%) were females. All the study patients were above 30 years old age with manifesting symptoms and signs of HE either at presentation or during the course of hospital stay. Majority of the patients in this study were from rural areas and belongs to poor socioeconomic group. This study also included patients with liver cirrhosis developing HE

known as acute fulminant hepatitis. Acute deficiency symptoms including mood disorders, sleep and speech disturbance, confusion, euphoria, astrexia and coma were reported in this study.

Petients Classification

Hepatic encephalopathy has four classes which are classified and described in the Table 1 based on the study of Maqsood et al. (2006).

Table 1. Shows the classification of hepatic encephalopathy.

Classification	Descriptions
1	Patients are associated with mild and mental confusion, slurred speech, depression or anxiety and reversed sleep rhythm
2	Patients are disinterested, moderate confusion, lethargy, drowsiness and lack of ability to do mental tasks
3	Patients are in stupor, inability to do mental tasks, severe confusion with high disorientation, but can response by voice
4	Patients are in deep coma and decelerate state with or without response to painful stimulations

Data Collection

A comprehensive questionnaire was developed for better data collection. A detailed clinical history of the patients were taken regarding the present and past diseases. Questions were asked regarding gastrointestinal bleeding (including hemetemesis and melana, fever, constipation, high protein diet, paracentesis and any trauma or surgery). In addition, application of any analgesics, tranquilizers, sedatives and cough syrups was inquired in detail as well. All patients were carefully examined with special attention to anemia, jaundice, asterixes, fever and ascites. Cases have been chosen in which the patient was infected with liver cirrhosis due to Heptatis B or C Virus and was hospitalized due to the aggravating factors.

Some laboratory examinations that recommended for these kind of patients include (white blood cell count, glucose, bilurubin, alanin trans aminase, haemoglubin, blood urea nitrate, creatinin and urine routine) were also investigated. An abdominal ultrasound was done to ensure for liver and splenic size, portal vein diameter, parenchymal echogenicity and ascites. In case of ascites, an ascitic tap was also done for observation of spontaneous bacterial peritonitis. Electrolyte test and physical examination of each patient such as HE classification, vital signs, demographic properties and laboratory tests were recorded and registered, accordingly. All patients were supervised during their stay in hospital and whether they survived or died at the end of the stay was also recorded.

RESULTS

Relationship of Age with Hepatic Encephalopathy and its Classification

The age difference of all patients suffering from HE and their groups are illustrated in the Table 2. The patients were aged between 30 – 89 years; thus, they were grouped into a ten years gap. Majority of the patients were aged between 40 – 70 years old (82%). The highest frequency of HE disease was recorded in the age of 60-69 (42%), followed by 50-59 (28%), 40-49 (12%), 30-39 (8%), 80-89 (6%) and 70-79 (4%).

Encephalopathy was classified based on the clinical criteria as given in Table 3. There were four classes of patients according to the classification mentioned in materials and method (patients and materials) section.

Majority of the patients were in fourth class (52%), followed by second class (20%), third class (16%) and first class (12%) of hepatic encephalopathy.

Table 2. Shoes the distribution of hepatic encephalopathy in different age gaps of patients.

Groups	Age (years)	Counting (patients)	Percent (%)
A	30-39	4	8
B	40-49	6	12
C	50-59	14	28
D	60-69	21	42
E	70-79	2	4
F	80-89	3	6
All		50	100

Table 3. Shows clinical classes of hepatic encephalopathy.

HE classes	Numbers (patients)	Percent (%)
First class	6	12
Second class	10	20
Third class	8	16
Fourth class	26	52
All	50	100

Exacerbating Factors and Type of Infections

The hepatic encephalopathy exacerbating factors are shown in Table 4. It is found that the exacerbating factors were including infections, constipation, gastrointestinal bleeding, acute renal failure, usage of sedative drugs and deficiency of Natrum (Na) and Potassium (P). Among them, infections were more frequent which were recorded in 22 patients (44%), followed by constipation in 10 patients (20%) and gastrointestinal bleeding in 6 patient (12%). However, acute renal failure, usgae of sedtive drugs and deficiency of Na and P had the lowest contribution in the exacebating factors, counting for 4%, 4% and 6%, repectively. While 10% were observed for no specific aggravating factors. As for the infections factor, 31 patients (62%) had positive hepatitis C virus (HCV), 17 patients (34%) had positive hepatitis B virus (HBV) and 2 patients (4%) had both type of hepatitis (HCV and HBV). Stood out was the most common factor based on the observation. Usage of drugs with ammonium salts, tranquilizers and large volume paracentesis were least common factors. Other common associations were ascites (64%), hyponatremia (50%), low haemoglobin (70%), hepatitis C (62%), and high mortality rate (30%).

Three types of infections, namely respiratory tract infections, urinary tract infections and gastrointestinal tract infections were the most distributed infections in hepatic encephalopathy patients which are presented in the Table 5. Among the type of infections the urinary tract infections were counted for 19% followed by git tract infections (16%) and respiratory tract infections (12%).

Table 4. Shows hepatic encephalopathy exacerbating factors.			
No	Exacerbating factors	Counting (patients)	Percent (%)
1	Infections	22	44
2	Constipation	10	20
3	Gastrointestinal bleeding	6	12
4	Acute renal failure	2	4
5	Usage of sedative drugs	2	4
6	Decrease Na and Potassium	3	6
7	No specific aggravating factors found	5	10
All		50	100

Table 5. Distribution of different types of infections within hepatic encephalopathy.		
Infection types	Counting	Percent (%)
Respiratory tract infections	6	12
Urinary tract infections	9	19
Gut tract infections	8	16
All	23	47
Note: for the evaluation of infection type 23 patients were recorded (N=23).		

DISCUSSION

For medical professionals and researchers worldwide, hepatic encephalopathy has never been anything less than a mystery (Farogh et al., 2014). Precipitating elements are still the most important stage in overall management, according to contemporary research (Bajaj, 2010). Research has also indicated that men are more likely to develop HE disease than women, and that the virus HCV is the main cause of hepatic cirrhosis (Rado, 2017). In this study, the patients were aged between 30 – 89 years; of them, the highest rate of HE (82%) were observed in patients with ages between 40 – 70 years old. The highest frequency of HE was recorded in the age of 60-69 (42%) which is similar to the data from Pakistan and other international text book and research (Maqsood et al., 2006). Additionally, we observed a modest male predominance in our patients' chronic liver disease progression to severe stages. The same outcomes were also reported by a Saudi Arabian study (Khan et al., 2003).

The most popular method for rating HE is the West Haven criteria (WHC). This classification scheme divides clinically apparent HE into four grades. Patients in grade I have a lack of focus and some mild personality changes that are mostly visible to their families. The most noteworthy result in grade II is temporal disorientation coupled with inappropriate behavior and laziness. Patients in grade III are comatose but responsive to stimuli. They may also behave strangely and appear to be lost in time and space. Patients in grade IV are coma-bound (Weissenborn, 2019). Our research has demonstrated the prevalence of fourth-class hepatic encephalopathy, which is consistent with the findings published in Pakistan (Maqsood et al., 2006).

Infection, gastrointestinal bleeding, constipation, some medications, surgery, or an alcohol binge are among the causes that frequently lead to an episode of hepatic encephalopathy (Mullen, 2007). This study discovered that sedative drug use, infection, constipation, gastrointestinal bleeding, acute renal failure, and a lack of Na and P were among the aggravating factors. Among them, systemic infections were more frequent which were recorded in 22 patients, followed by constipation in 10 patients and gastrointestinal bleeding in 6 patient. Similar observations were reported in Pakistan's Punjab area, where research indicated that constipation, infections, and gastrointestinal bleeding are the primary causes of HE (Maqsood et al., 2006). It is true that diseases could spread similarly throughout the two nations' populations because they have a comparable degree of education, socioeconomic standing, and cultural practices (Mumtaz et al., 2010). As a result, professionals from the two nations might collaborate to develop the best therapy management and coping mechanisms for HE. The sole distinction is that more respiratory infections were seen in Afghanistan than in Pakistan, which may be related to the latter's higher levels of pollution and climatic change. As a result, respiratory tract infections are more common in cold weather than in hot weather in Pakistan, which is warmer than Afghanistan (Mumtaz et al., 2010). Furthermore, three types of infections, namely respiratory tract infections, urinary tract infections and gut tract infections were the most distributed infections in hepatic encephalopathy patients in this study.

On the other hand, electrolyte imbalance, infections, and drinking alcohol are the most prevalent factors in London (Khan et al., 2003). However, due to differences in Afghan culture and religion from those of Landon, people in Afghanistan do not consume alcohol, and the electrolyte imbalance was not studied in this study. Contrarily, investigations carried out in the industrialized western countries have demonstrated that alcohol is the primary etiological cause of HE (Menon et al., 2001).

Due to the high frequency of hepatitis B and C infection, chronic liver disease patients are frequently seen in our nation and worldwide (Romero-Gomez et al., 2001). This study further justifies the growing concern that the hepatitis C virus is on the verge of becoming an epidemic and a major contributor to liver cirrhosis because 62% of our patients tested positive for the virus in Afghanistan. This is completely consistent with the study conducted by Alam et al. (2005) in the NWFP state of Pakistan. Another likely explanation is that the majority of our patients had end-stage cirrhosis, the most common cause of which was hepatitis C. In our investigation, hepatitis B was a rare cause of cirrhosis as well.

CONCLUSION

When the development of hepatic cirrhosis is brought on by delayed HCV and HBS headache and exacerbating factors including infection constipation, digestive tract infections use of sedative drugs and more, hepatic encephalopathy arises. In this study, upper infection, gastrointestinal bleeding, and constipation were the most frequent triggering factors of hepatic encephalopathy. Infections, particularly respiratory illnesses, are regarded as the best exacerbating factors in Afghan society. In order to prevent hepatic encephalopathy in patients with chronic liver disease, caution must be used while prescribing diuretics, early and efficient infection control measures must be taken, and better hygienic conditions in government hospitals must be maintained. Regarding hospital resources, medications, and labor-intensive tasks, these factors should be given top priority. When administering diuretics to cirrhotic individuals, caution must be used. To avoid constipation, it should also be advised to utilize fiber and lactulose consistently.

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Conflict of interest

The authors declare no conflict of interest.

REFERENCES

Alam, I., Razaullah, H. I., Humayun, M., Taqweem, M. A., & Nisar, M. (2005). Spectrum of precipitating factors of hepatic encephalopathy in liver cirrhosis. *Pakistan Journal of Medical Research*, *44*(2), 96-100.

Bajaj, J. S. (2010). Current and future diagnosis of hepatic encephalopathy. *Metabolic Brain Disease*, *25*, 107-110.

Dieperink, E., Willenbring, M., & Ho, S. B. (2000). Neuropsychiatric symptoms associated with hepatitis C and interferon alpha: a review. *American Journal of Psychiatry*, *157*(6), 867-876.

Farogh, A., Naeem, H. A. G., & Ahmad, U. (2014). Spontaneous bacterial peritonitis in liver cirrhosis patients having hepatic encephalopathy. *Pakistan Journal of Medical & Health Sciences*, *8*(2), 429-431.

Gad, Y. Z. (2012). Precipitating factors of hepatic encephalopathy: An experience at Mansoura Specialized Medical Hospital, Egypt. *Annals of Tropical Medicine & Public Health*, *5*(4).

Hunot, S., & Hirsch, E. C. (2003). Neuroinflammatory processes in Parkinson's disease. *Annals of Neurology: Official Journal of the American Neurological Association and the Child Neurology Society*, *53*(S3), 49-60.

Khan, I. M., Hameed, K., & Ahmad, S. (2003). Effects of aminoleban on consciousness level in patients with hepatic encephalopathy secondary to chronic liver disease. *Journal of Postgraduate Medical Institute*, *17*(2).

Lim, C. G., Hahm, M. H., & Lee, H. J. (2023). Hepatic encephalopathy on magnetic resonance imaging and its uncertain differential diagnoses: a narrative review. *Journal of Yeungnam Medical Science*, *40*(2), 136.

Maqsood, S., Saleem, A., Iqbal, A., & Butt, J. A. (2006). Precipitating factors of hepatic encephalopathy: experience at Pakistan Institute of Medical Sciences Islamabad. *Journal of Ayub Medical College Abbottabad*, *18*(4), 57-61.

Mathers, C. D., Boerma, T., & Ma Fat, D. (2009). Global and regional causes of death. *British Medical Bulletin*, *92*(1), 7-32.

Menon, K. N., Gores, G. J., & Shah, V. H. (2001, October). Pathogenesis, diagnosis, and treatment of alcoholic liver disease. In *Mayo Clinic Proceedings* (Vol. 76, No. 10, pp. 1021-1029). Elsevier.

Mullen, K. D. (2007). Review of the final report of the 1998 working party on definition, nomenclature and diagnosis of hepatic encephalopathy. *Alimentary Pharmacology & Therapeutics*, *25*, 11-16.

Mumtaz, K., Ahmed, U. S., Abid, S., Baig, N., Hamid, S., & Jafri, W. (2010). Precipitating factors and the outcome of hepatic encephalopathy in liver cirrhosis. *Journal of the College of Physicians and Surgeons Pakistan*, *20*(8), 514.

Ong, J. P., Aggarwal, A., Krieger, D., Easley, K. A., Karafa, M. T., Van Lente, F., ... & Mullen, K. D. (2003). Correlation between ammonia levels and the severity of hepatic encephalopathy. *The American journal of medicine*, *114*(3), 188-193.

Rado, J. (2017). Hepatitis C among the mentally ill: Review and treatment update. *Current Psychiatry*, *16*(3), 41-47.

Romero-Gómez, M., Boza, F., García-Valdecasas, M. S., García, E., & Aguilar-Reina, J. (2001). Subclinical hepatic encephalopathy predicts the development of overt hepatic encephalopathy. *The American Journal of Gastroenterology*, *96*(9), 2718-2723.

Romero-Gómez, M., Montagnese, S., & Jalan, R. (2015). Hepatic encephalopathy in patients with acute decompensation of cirrhosis and acute-on-chronic liver failure. *Journal of Hepatology*, *62*(2), 437-447.

Sivakrishnan, S., & Pharm, M. (2019). Liver disease overview. *World Journal of Pharmacy and Pharmaceutical Sciences*, *8*(1), 1385-1395.

Weissenborn, K. (2019). Hepatic encephalopathy: definition, clinical grading and diagnostic principles. *Drugs*, *79*(1), 5-9.