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Research Article

APPETITE ASSESSMENT IN CHRONIC LIVER DISEASE PATIENTS WITH MINIMAL HEPATIC ENCEPHALOPATHY

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ABSTRACT

Total 119 stable CLD patients were selected in the study after fulfilling the eligibility criteria. The incidence of MHE among the total patients, as diagnosed by PHES or CFF test was detected in 79 out of 119 patients (66.39%) with cirrhosis without overt HE, whereas the remaining 40 patients were not considered to have MHE (Non MHE).. The appetite of the patients in both the groups MHE and Non MHE was assessed using a series of self administered questions. The mean appetite score was found to be lower in MHE group (19.82±5.47) as compared to Non MHE group (21.13±4.60) among the CLD patients but there was no significant difference. In the present study, the average scores ranged from 19.82 to 21.13 indicate that all the patients in MHE and Non MHE group were assessed to be requiring frequent reassessment. Appetite is often poor among the cirrhotic patient. Among all the patients, only 6.7% (8/119) patients reported good appetite score in this study and who were not at risk this time. Whereas 67.23% patients were assessed to be requiring frequent reassessment and 26% patients had poor appetite score and were at risk for anorexia and needed nutrition counselling. In the present study, most patients had poor appetite score and all these patients belonged to MHE group. Therefore MHE is more prevalent in those patients who were malnourished and had poor appetite. 80.64% patients with stable CLD were reported poor appetite score (8-16) and they all belonged to MHE group. Therefore poor appetite was found in most MHE patients. Thus these patients need extensive dietary intervention.

Keywords: *MHE (Minimal Hepatic Encephalopathy), PHES (Psychometric Hepatic Encephalopathy Score), CFF (Critical Flicker Frequency)*

INTRODUCTION

Cirrhosis of the liver is a devastating condition, commonly the result of decades of chronic inflammation from toxin (eg alcohol), viral infection (eg Hepatitis B) or immune mediated disease (eg autoimmune disease). It is well recognized that patients with cirrhosis or chronic hepatic disease develop neuro cognitive impairment, characterized by manifestations that vary from subtle to severe enough to limit functional operability. This impairment increases morbidity and mortality and progresses to hepatic encephalopathy (HE) (Bajaj *et al.,* 2009 & Prasad *et al.,* 2007). HE is a major complication of cirrhosis and is associated with poor prognosis (Bustamane *et al.,* 1999 & Hui *et al.,* 2002). Hepatic encephalopathy (HE) is a major complication that develops in some form and at some stage in a majority of patients with liver cirrhosis. Overt HE occurs in approximately 30–45% of cirrhotic patients reported by Ferenci *et al.,* (2002) & Prasad *et al.,* (2007) and in 10–50% of patients with transjugular intrahepatic portosystemic shunt (TIPS) (Poordad, 2007). Minimal HE (MHE), the mildest form of HE, is characterized by subtle motor and cognitive deficits, and impairs health-related quality of life (HRQOL) (Das *et al.,* 2001).

MHE is considered clinically relevant for at least 3 reasons. First, it impairs patients' daily functioning and health-related quality of life (HRQOL) (Groeneweg *et al.,* 1998; Marchesini *et al.,* 2001; Schomerus *et al.,* 2001), and many patients with MHE may be unfit to drive a car (Watanabe *et al.,* 1995; Schomerus *et al.,* 1981; Wein *et al.,* 2004). Second, it predicts the development of overt HE (Das *et al.,* 2001; Romero-Gomez *et al.,* 2001 & 2002; Saxena *et al.,* 2002). Finally, it is associated with a poor prognosis reported by Amodio *et al.,* 1999 and Romero-Gomz *et al.,* 2004.

Research Article

Malnutrition and Cirrhosis of Liver

Malnutrition: Protein-energy malnutrition (PEM) has often been observed in patients with liver cirrhosis (Lautz *et al.*, 1992; Moriwaki 2002). Causes for malnutrition in liver cirrhosis are known to include a reduction in oral intake (for various causes), increased protein catabolism and insufficient synthesis, and malabsorption/ maldigestion associated with portal hypertension (Lautz *et al.*, 1992; Coltorti *et al.*, 1991; Sobhonslidsuk *et al.*, 2001). Although a consequence of the disease, malnutrition alone can lead to further morbidity in patients with liver cirrhosis. Increased rates of septic complications, poorer quality of life, and a reduced life span have all been observed in cirrhotics with poorer nutrition status compared to those without (Alberino *et al.*, 2001; Dan *et al.*, 2008).

In Asia, the high prevalence of chronic Hepatitis B infection, has resulted in large numbers of people developing liver cirrhosis with its' associated complications (Obata & Nishioka 1979). Most of the data on malnutrition in patients with cirrhosis have been derived from Western patients in whom chronic alcohol ingestion has been the commonest a etiology. It is uncertain, therefore, if Asian patients with cirrhosis have the same degree of malnutrition and its' resultant morbidity as patients with cirrhosis from other parts of the world.

Malnutrition is an increasingly recognized complication of chronic liver disease that has important prognostic implications. Malnourished patients with cirrhosis have a higher rate of complications and, overall, an increased mortality rate. Malnutrition has significant implications for liver transplantation; it has been shown that patients with poor nutritional status before transplantation have increased complications and higher mortality rates postoperatively (Alberino *et al.*, 2001). Screening all patients with chronic liver disease for nutritional abnormalities can identify those at risk of developing preventable complications (Pikul *et al.*, 1994; Harrison *et al.*, 1997). Malnutrition is a common complication of end-stage liver failure (cirrhosis) and is an important prognostic indicator of clinical outcome (survival rate, length of hospital stay, post transplantation morbidity, and quality of life) in patients with cirrhosis. Several studies have evaluated nutritional status in patients with liver cirrhosis of different etiologies and varying degrees of liver insufficiency (IMCP 1994; Muller 1995) leading to a consensus of opinion that malnutrition is recognizable in all forms of cirrhosis (Caregaro *et al.*, 1996) and that the prevalence of malnutrition in cirrhosis has been estimated to range from 65%–100% (Mendenhall *et al.*, 1995; Campillo *et al.*, 2003). The causes of malnutrition in liver disease are complex and multifactorial.

Anorexia is common in patients of advanced age and can lead to drastic weight loss. Consequences of weight loss associated with anorexia can be devastating in all age groups and constitute a special problem in older adults. In the elderly, complications of anorexia-related weight loss include frailty, falls, hip fractures, compromised immunity, and pressure ulcers. Older adults with anorexia-associated weight loss are also more likely to die than their robust counterparts.

Anorexia-related weight loss can have devastating consequences on quality-of-life, morbidity, and mortality. CNAQ is short, simple appetite assessment tools that predict weight loss in community-dwelling adults and long-term care residents.

Objectives

The purpose of the present study was to assess the nutritional status of MHE patients by appetite assessment.

MATERIALS AND METHODS

The study was carried out at the Department of Gastroenterology, Sawai Man Singh Medical College and Hospital, Jaipur, Rajasthan (a tertiary level health care centre). All CLD patients who visited from August1, 2009, to July 31, 2010 aged between 30-70 years were screened for the study. Purposive sampling was used. The diagnosis of cirrhosis was based on clinical, biochemical, and ultrasonographic or liver histology, if available. Patients were selected on the basis of the inclusion & exclusion criteria.

The diagnosis of MHE was based on neuropsychological assessment & critical flicker frequency test (CFF –done by Hepatonorm Analyzer; score < 39 MHz). On the basis of this, the subjects were divided into two groups: MHE & Non MHE. Appetite assessment was evaluated by new screening tool that detects appetite problems in adults.

General Clinical and Laboratory Assessment

All patients were subjected to detailed history taking and physical examination. Laboratory assessment was carried out. Severity of liver disease was calculated according to the Child-Pugh score with grades A (mild) to C (severe) indicating degree of hepatic reserve and function. Etiology of cirrhosis was evaluated.

Neurological Assessment

Clinical examination included a thorough general physical examination, taking vitals and a systemic examination including complete neurological and mental state examination using the Mini Mental State Examination to exclude the presence of any illness that could have caused or affected neurological status or quality of life.

Diagnosis of MHE

All patients underwent a series of psychometric tests, which include number connection tests (NCT A, NCT B), if literate and figure connection tests (FCT A, FCT B), if illiterate. Three performance subtests of the Wechsler Adult Intelligence Scale — Digit Symbol Test (DST), Picture Completion Test (PCT), and Block Design Test (BDT) (Ferenci *et al.,* 2002; Dhiman 1995) along with the critical flicker frequency measurement (CFF) were also conducted. The diagnosis of MHE was made if any two of the NP tests were impaired beyond 2 standard deviations (s.d.) of known control values. This diagnostic criterion conforms to the consensus statements of Ferenci *et al.,* in 2002. These tests were performed over a period of 35 – 40 min.

Nutritional Assessment (NA)

Nutritional status was assessed by appetite assessment. It is a new screening tool that detects appetite problems in adults. The appetite of the patients in both the groups MHE and Non MHE was assessed using a series of self administered questions. Higher score (>28) was indicative of better appetite and indicated that patients are not at risk at this time (annexure no. 7). Lower score (8-16) was indicative of poor appetite and the patient is at risk for anorexia and needs nutrition counselling. Score between17-28 was suggestive that patients needs frequent reassessment.

Statistical Analysis and Data Management

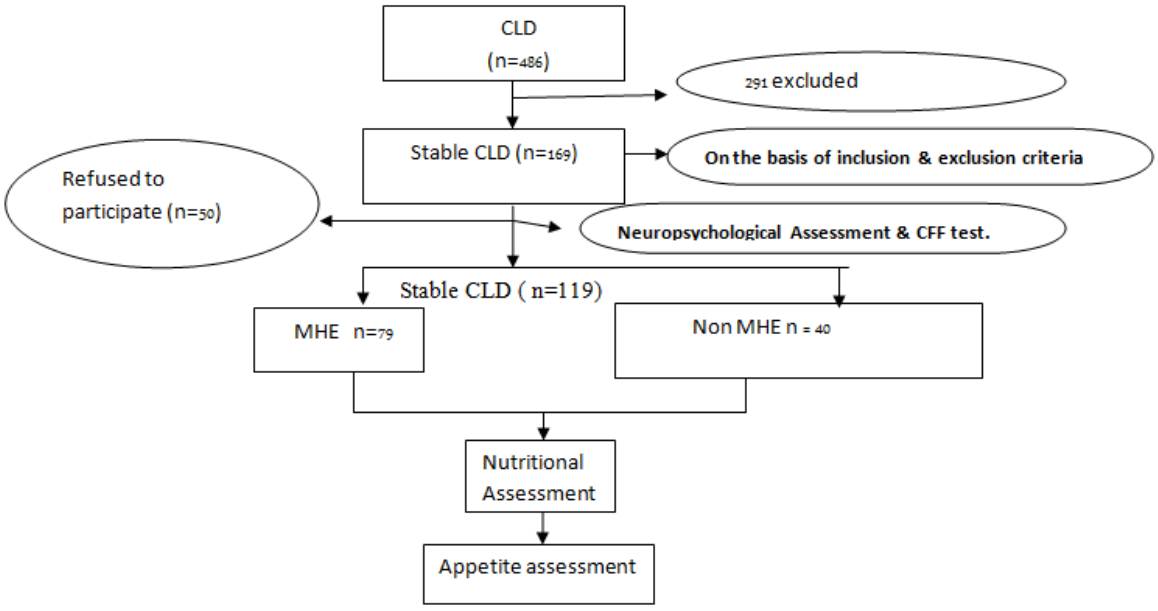

Figure 1: Study Design

Data processing was performed by using Microsoft excel 2007 & SPSS version 10.0 (SPSS, Chicago,IL) in this study. Mean and standard deviations were calculated. Statistical analysis was done using Student's *t* test (unpaired) and Chi-squared test. Correlations between different tests were calculated by Spearman's rank-order correlation coefficient.

RESULTS AND DISCUSSION

A total of 460 patients with liver cirrhosis were screened during the study period. Out of these, 169 (37.8%) patients met the eligibility criteria, whereas 291 (63.2%) patients were excluded. The reasons for exclusion were a history of overt Hepatic Encephalopathy (126); History of recent (6 weeks) alcohol intake(63); History of recent (6 weeks) gastrointestinal bleeding(18); History of recent (6 reasons for exclusion were a history of overt Hepatic Encephalopathy (126); History of recent (6 weeks) use of any nutritional supplementation (13) & drugs affecting psychometric performances like benzodiazepines, antiepileptic, or psychotropic drugs (10); History of shunt surgery or transjugular intrahepatic portosystemic shunt for portal hypertension(4); Electrolyte imbalance(8); Renal impairment (11); Hepatocellular carcinoma (3); Severe medical problems such as congestive heart failure, pulmonary disease, or neurological or psychiatric disorder that could influence quality-of-life measurement and Inability to perform Neuropsychological tests and unable not having enough comprehension to fill quality of life questionnaire(35).

Demographic Characteristics

The mean age of the study group was 45.49 years. Data on education (Table-1) revealed that in the total study group 21% were illiterate, 56.3% had ≤ 12 years of formal education, 18.5% had achieved their graduation and about 4.2% had completed their post graduation or higher degree. Thus most patients were not very well educated. Most patients belonged to lower middle class and upper lower class in both MHE and Non MHE group.

Table 1: Demographic characteristics of the patients

Characteristics	Total cirrhotic patients (n=119)	MHE (n=79)	Non-MHE (n=40)
Demographic characteristics			
Age	45.49+11.95	47.11+11.79	42.27+11.75
Male:Female	101:18	69:10	32:8
Rural:Urban	59:60	41:38	18:22
Education			
Illiterate	25(21%)	18 (22.78%)	7 (17.5%)
School education	67(56.3%)	44 (55.70%)	23 (57.5%)
Graduate	22 (18.49%)	14 (17.72%)	8 (20%)
Post Graduate	5 (4.2%)	3 (3.80%)	2 (5%)
Socio-Economic Status			
Upper Class	7 (5.88%)	4 (5.06%)	3 (7.5%)
Upper Middle Class	26 (21.85%)	20 (25.32%)	6 (15%)
Lower Middle Class	46 (38.66%)	28 (35.44%)	18 (45%)
Upper Lower Class	39 (32.77%)	26 (32.91%)	13 (32.5%)
Lower Class	1 (0%)	1 (1.27%)	0
	Footnote: Figures in parenthses denote %		

Clinical Characteristics

Total 169 stable CLD patients met the eligibility criteria, out of these 50 patients refused to participate in the study. Severity of liver disease was calculated according to the Child-Pugh score with grade A (mild) to C (severe) indicating degree of hepatic reverse and function (Albers *et al.*, 1989). In the study group

(119 subjects) 23 subjects (19.33%) were in Child Pugh Class A, 62 subjects (52%) were in Class B and 34 subjects (28.57%) were in Class C. Their mean age was 45.49±11.95years. The most common reasons for admission was tense ascites, jaundice, infection, diarrhea, abdominal discomfort and other. The etiology of cirrhosis was owing to alcohol consumption (n=50; 42%), chronic hepatitis B (n=42; 35.3%), chronic hepatitis C (n=16; 13.44%) and other (n=11; 9.24%) as seen in Table 2.
In the study group, 66.39% patients were found to have MHE, 36.97% (44/119) based on positive PHES results alone, 44.54% (53/119) based on positive CFF test results alone and 15.12% (18/119) based on a positive results for both tests.

Table 2: The baseline clinical characteristics of the MHE and Non MHE patients

Clinical Characteristics	Total (n=119)	MHE (n=79)	Non MHE (n=40)
Severity of disease			
CTP Class A	23 (19.33%)	7 (30.44%)	16 (69.56%)
CTP Class B	62 (52.10%)	44 (71%)	18 (29%)
CTP Class C	34 (28.57%)	28 (82.35%)	6 (17.65%)
Etiology			
Alcohol	50 (42.02%)	34 (68%)	16 (32%)
HBV	42 (35.29%)	27 (64.29%)	15 (35.71%)
HCV	16 (13.44%)	13 (81.25%)	3 (18.75%)
Other	11 (9.24%)	5 (45.46%)	6 (54.54%)
Clinical sign			
Jaundice	54 (45.38%)	39 (72.22%)	15 (27.8%)
Ascites and odema	73 (61.34%)	52 (71.23%)	21 (28.76%)

Footnote: Figures in parenthses denote %

In the present study, 34 subjects were in Class C, out of these 28 (82.35%) patients were from MHE. 44/62 (71%) patients with MHE were in Class B and only few patients 7/23 (30.44%) with MHE were from Class A. Etiology of cirrhosis was considered more in MHE group as seen in Table-2.
Jaundice and ascites was found to be more prevalent in MHE group. The severity of CLD as indicated by CTP class was also more prevalent in the MHE group.

Nutritional Assessment

Nutritional status was assessed by appetite assessment.

Table 3: Average Appetite Score of the Patients Diagnosed as MHE and Non MHE

Male			Female			Total		
MHE	Non MHE	P-value	MHE	Non MHE		MHE	Non MHE	P-value
19.91± 5.55	21.47± 4.83	0.17	19.20± 5.14	19.75± 3.41	0.79	19.82± 5.47	21.13± 4.60	0.19

In the present study, the average scores ranged from 19.20 to 21.47 indicate that all the patients in MHE and Non MHE group were assessed to be requiring frequent reassessment (table-3). The mean appetite score was found to be lower in MHE group as compared to Non MHE group in males and among the total patients but there was no significant difference. In the female subjects, the mean appetite score was similar in both the group. Appetite is often poor among the cirrhotic patient. Among all the patients, only 6.7% (8/119) patients reported good appetite score in the study and who were not at risk this time. Whereas 67.23% patients were assessed to be requiring frequent reassessment and 26% patients had poor appetite score and were at risk for anorexia and needed nutrition counselling.

In the present study, most patients had poor appetite score and all these patients belonged to MHE group. Therefore MHE is more prevalent in those patients who were malnourished and had poor appetite. These patients reported at risk for anorexia and needed nutrition counselling. Poor appetite score (8-16) was reported 77.78% in male, 100% in female and 80.64% in total patients and they all belonged to MHE group (table-4 & figure 1). Therefore poor appetite was found more prevalent in MHE group. Thus these patients need extensive dietary intervention.

Table 4: Frequency of the Appetite Score among the Patients Diagnosed as MHE and Non MHE.

Appetite score	Male (n=101)			Female (n=18)			Total (n=119)		
	Total	MHE (n=69)	Non MHE (n=32)	Total	MHE (n=10)	Non MHE (n=8)	Total	MHE (n=79)	Non MHE (n=40)
8-16	27	21(77.78%)	6(22.22%)	4	4(100%)	0	31	25(80.64%)	6(19.35%)
17-28	67	45(67.16%)	22(33.84%)	13	5(38.46%)	8(61.54%)	80	50(62.5%)	30(37.5%)
>28	7	3 (42.86%)	4 (57.14%)	1	1(100%)	0	8	4 (50%)	4 (50%)

Note: Figures in parentheses denote%.

Association between Appetite Score, Dietary Intake and Quality of Life

Positive significant association was achieved between the appetite of the patients and nutrients intake. This suggests that with the increase in appetite of the patients, dietary intake is expected to improve. Achord (1993) *et al.*, reported in a study that increase in appetite would be followed by an increase in volume of the diet, resulting in better protein intake which would have resulted in improvement in the serum albumin levels. Positive significant association was achieved between the appetite and quality of life of the with MHE which indicates that with the increase in appetite, the QOL would improve. Higher score (>28) of appetite, was indicative of better appetite and patients are not at risk at this time.

Discussion

The present study of nutritional assessment in cirrhotic patients with MHE had some limitations. The study was conducted in Govt. Hospital so most of the patients were from lower middle class and upper lower class (table-1). MHE is fairly common in patients with CLD. The prevalence of MHE in our patient population with cirrhosis who did not have any past history of OHE was 66.39%. This study provides useful data regarding appetite assessment of CLD patients with MHE. CTP class has been identified as a risk factor for malnutrition among these patients and most of the patients with MHE were in CTP class C. The prevalence of MHE was reported to be higher in patients with cirrhosis with CTP class B and C, advanced age, alcoholic etiology, a previous episode of overt HE and portosystemic shunts (Ortiz *et al.*, 2005). None of the patients in this study had a previous episode of overt HE or had undergone portosystemic shunt surgery. Alcohol consumption and hepatitis B were the most common etiology among the CLD patients and more in MHE group therefore it may be possible that etiology or CTP class affected the prevalence of MHE.

A new screening tool that detects appetite problems in adults was used in CLD patients to diagnose grade of malnutrition in both the group MHE and Non MHE. Appetite is often poor among the cirrhotic patient. 67.23% patients were assessed to be requiring frequent reassessment and 26% patients had poor appetite score and were at risk for anorexia and needed nutrition counselling. Most of the patients had poor appetite score and all these patients belonged to MHE group. Therefore MHE is more prevalent in those patients who were malnourished and had poor appetite. The patients with MHE were found to have poor score of appetite there by indicating higher prevalence of malnutrition than the Non MHE group. The poor dietary intakes could be the reason for malnutrition.

Conclusion

To summarize, prevalence of malnutrition was found to be higher in MHE group and poor appetite was found more prevalent in MHE group, therefore nutritional intervention needs to be provided to avoid the risk of malnutrition and to prevent CLD patients to proceed towards overt MHE. As soon as a CLD

patient is diagnosed, identification of malnutrition by nutritional assessment and MHE by the neuropsychological tests should not be delayed. MHE patients need more nutritional care than Non MHE patients. This study has shown that Nutritional status in cirrhotic patients with MHE was poor compared to those patients who are Non MHE. Therefore in the CLD patients, diagnosis of MHE is important and necessary to prevent conversion to covert/ overt HE. The role of dietician in identification of malnutrition and providing timely nutritional intervention is very vital to improve the survival and prognosis of MHE patients.

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