



**ORIGINAL RESEARCH PAPER**

**Gastroenterology**

**ASSESSMENT OF NUTRITIONAL STATUS OF CHRONIC LIVER DISEASE PATIENTS ATTENDING MEDICAL OPD AT A LARGE HOSPITAL IN DELHI**

**KEY WORDS:** Chronic liver disease, SGA score, Malnutrition

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**ABSTRACT**

**Background:** Protein-energy malnutrition is a frequent finding in chronic liver disease (CLD) patients and is an independent predictor of poor outcomes of the disease. Its assessment is challenging owing to the overestimation of true weight resulting from fluid retention. **Aim:** To assess the nutritional status and associated risk factors of patients aged 18 – 60 yrs. with CLD attending the outpatient department of a large hospital. **Materials and Methods:** Nutritional assessment of the patients was done by using the Subjective Global Assessment (SGA) tool and patients were classified as; well-nourished-A, moderately malnourished-B, and severely malnourished-C. Risk factors associated with malnutrition were assessed using appropriate statistical methods. **Results:** In our study a statistically significant relationship was found between the severity and aetiology of CLD with malnutrition by SGA score. Malnutrition was more common in patients with Alcohol as a cause for CLD. **Conclusion:** Malnutrition is more frequent and severe in alcohol-related CLD and increases with the severity of CLD so attention to proper nutrition is important to decrease morbidity and mortality in these patients.

**Introduction**

The liver exercises essential functions metabolism<sup>1</sup>. These functions are compromised in patients suffering from chronic liver disease (CLD) and result in the development of protein energy malnutrition (PEM) <sup>2</sup>. The aetiology of malnutrition in CLD is multifactorial ranging from impaired dietary intake, malabsorption of nutrients to altered macronutrient metabolism<sup>3</sup>. Malnutrition is proven to be an independent predictor of poor clinical outcomes in cirrhotic patients. Further, malnutrition increases morbidity, mortality, and cost of medical care in CLD patients<sup>4,5</sup>.

According to the world health organization (WHO) data published in 2018, with 0.26 million deaths, liver disease was responsible for 3% of the total deaths in India<sup>6</sup>. Malnutrition is common in patients with advanced liver disease with reported prevalence of 50 – 90% among cirrhotic patients<sup>7-8</sup>. Assessing the nutritional status in cirrhotic patients is challenging as fluid retention hinders the interpretation of simple criteria such as body weight and body mass index (BMI). CLD itself causes alteration in visceral protein synthesis, cellular immunity, and total lymphocyte count independent of PEM<sup>9</sup>.

The Subjective Global Assessment (SGA) tool is shown to be effective at identifying malnutrition<sup>9</sup>. The clinical score of SGA allows diagnosis and classification of severity of malnutrition. It is a useful tool for nutritional assessment in patients suffering from various medical conditions including renal and hepatic diseases<sup>11</sup>.

**AIM:**

To assess the nutritional status and associated risk factors of patients aged 18 – 60 yrs. with CLD attending the outpatient department of a large hospital.

**Materials & Methods**

**Study design:**

A cross-sectional study was conducted on 101 patients aged 18 to 60 years with a confirmed diagnosis of CLD attending Medical OPD in a large hospital from January 2022 to July 2022.

**Inclusion criteria:**

1. Patients with confirmed diagnosis of CLD, aged 18 to 60 years.

**Exclusion criteria:**

1. Patients with decompensated CLD
2. Diabetes Mellitus
3. Malignancy

**Methodology:**

The study was approved by the institute's ethical committee and informed consent was taken from the study participants. Detailed History was taken about socio-demographic characteristics (age, gender, occupation, and educational level), duration of disease, symptoms, aetiology of CLD, and calorie and protein intake. A general physical examination was performed to detect ascites, edema, and features of liver failure along with anthropometric measurements (weight, body mass index, triceps skin fold thickness). Laboratory assessment included complete blood counts, liver function tests, prothrombin time, and serum testosterone levels. Nutritional assessment of the patients was done by using a pre-validated SGA scale. Based on the findings of the SGA scale the patients were classified as well-nourished-A, moderately malnourished-B, and severely malnourished-C.

CLD was defined as the radiologically progressive destruction of liver parenchyma over a period of more than six months leading to fibrosis and cirrhosis. The severity of liver disease was assessed by Child-Pugh score (grades A, B, or C) indicating the degree of hepatic reserve and function. <sup>12</sup>

The statistical analysis of the continuous variables was summarized by the arithmetic mean, and standard deviation (SD). Categorical variables were summarized using frequencies and percentages. ANOVA test was used to compare the means of parametric quantitative variables. The chi-square test was used to compare qualitative parametric variables while the fisher exact test was used to compare non-parametric qualitative variables. A two-sided P<0.05 was considered significant. Statistical analysis was performed using the statistical package for social science (SPSS) version 16.0.

**Results**

Total 101 patients were included in the study. The mean age was  $47.6 \pm 11.0$  years and 55 (54.5%). Of the 101 patients, 80 (79.2%) belonged to lower socio-economic status. The common causes of CLD were Alcoholic Liver disease in 57(56.4%) patients and non-alcoholic fatty liver disease (NAFLD) in 31 (30.7%) patients. Mean duration of CLD was  $2.98 \pm 2.94$  years (Table 1).

**Table 1: Socio-demographic characteristics of the study participants (N=101)**

Variables	Frequency N (%)	Mean $\pm$ SD
<b>Age Group (in years)</b>		
Less than 40	20 (19.8)	$47.66 \pm 11.05$ years
41-50	35 (34.7)	
51-60	46 (45.5)	
<b>Sex</b>		
Male	81 (80.2)	
Female	20 (19.8)	
<b>Education status</b>		
Illiterate	18 (17.8)	
Primary	27 (26.7)	
Secondary	28 (27.7)	
Higher Secondary	16 (15.8)	
Graduate	11 (10.9)	
Post Graduate	1 (1.0)	
<b>Etiology of CLD</b>		
Alcohol-related	57 (56.4)	
Autoimmune	6 (5.9)	
Hemochromatosis	1 (1.0)	
NFLD	31 (30.7)	
Primary biliary cholangitis	3 (3.0)	
Viral hepatitis	3 (3.0)	
<b>Duration of CLD</b>		
6 months-2 years	58 (57.4)	$2.98 \pm 2.94$ years
>2 years	43 (42.6)	
<b>Symptoms/signs</b>		
Splenomegaly	82 (81.2)	
Hepatomegaly	47 (46.5)	
Ascites	47 (46.5)	
Pedal edema	27 (26.7)	
Icterus	25 (24.8)	
Pallor	31 (30.7)	

The nutritional status of the patients based on BMI and SGA scale is shown in Table 2. Subjective Global Assessment (SGA) score was calculated after taking detailed medical history, nutritional history and subjective history of functional capacity. Physical examination for subcutaneous fat, muscle wasting and fluid retention was also done. Majority of the patients (55.4%) were well-nourished (SGA, A) that is no decrease in food/nutrient intake; < 5% weight loss; no/minimal symptoms affecting food intake; no deficit in function; and no deficit in fat or muscle mass. 45 (44.6%) patients were found to be mildly/moderately malnourished (SGA, B), that is a definite decrease in food/nutrient intake; 5-10% weight loss without stabilization or gain; mild/some symptoms affecting food intake; moderate functional deficit or recent deterioration; and mild/moderate loss of fat and/or muscle mass (Table 2).

**Table 2: Nutritional assessment of study participants (N=101)**

Variables	Frequency N (%)
<b>BMI</b>	
Underweight	5 (5.0)
Normal weight	55 (54.5)
Overweight	32 (31.7)
Obese	9 (8.9)

<b>SGA Score</b>	
A	56 (55.4)
B	45 (44.6)

The association of the SGA nutritional score with the socio-demographics and clinical parameters shows a statistically significant relationship between the severity of cirrhosis (Child-Pugh score) and the aetiology of CLD with the SGA score (Table 3).

**Table 3: Association of SGA nutritional score with clinical parameters (N = 101)**

Variables	Subjective Global Assessment (SGA)			
	A	B	Total	P value
<b>Age Group (in years)</b>				
<40	12	8	20	0.59
41-50	17	18	35	
51-60	27	19	46	
<b>Gender</b>				
Male	46	35	81	0.58
Female	10	10	20	
<b>Severity of CLD</b>				
Child-Pugh score A	20	5	25	0.01
Child-Pugh score B	26	33	59	
Child-Pugh score C	10	7	17	
<b>Duration of CLD (in years)</b>				
1-2 year	34	24	58	0.45
>2 years	22	21	43	
<b>Aetiology of CLD</b>				
Alcohol-related	30	27	57	0.02
Autoimmune	3	3	6	
Hemochromatosis	0	1	1	
NFLD	23	8	31	
Primary biliary cholangitis	0	3	3	
Viral hepatitis	0	3	3	

No statistically significant association between SGA and laboratory findings such as haemoglobin, TLC, platelet count, serum bilirubin, serum albumin, SGPT, and prothrombin time was found (Table 4).

**Table 4: Association of SGA nutrition scale with Laboratory parameters (N = 101)**

Variables	Subjective Global Assessment (SGA)			
	A	B	Total	P value
<b>Haemoglobin (%)</b>				
Normal	23	18	41	0.72
Mild/ Moderate Anaemia	30	19	29	
Severe Anaemia	13	8	31	
<b>Total Lymphocyte count (TLC)</b>				
Normal	13	14	27	0.37
Low	43	31	74	
<b>Platelet count</b>				
Normal	27	11	38	0.45
Low	25	28	53	
Very Low	4	6	10	
<b>Serum ALT levels (SGPT)</b>				
Normal	40	31	71	0.95
Mild	15	13	28	
Moderate	1	1	2	
<b>Serum Bilirubin</b>				
Normal	24	19	43	0.51
Mildly Elevated	23	22	45	
High Elevated	9	4	13	

Serum Albumin				0.24
Normal	18	8	26	
3.5-2.8	28	26	54	
<2.8	10	11	21	
Prothrombin Time (PT)/ INR				0.14
Normal	43	32	75	
1.7-2.3	7	12	19	
>2.3	5	1	6	

**Discussion**

The Liver is the major site of metabolism in the human body. It is involved in wide range of physiological and biochemical processes including protein and energy metabolism. Therefore, the problem of malnutrition and nutritional deficiencies would evidently succeed in patients suffering from chronic liver diseases.<sup>3</sup> The present study was done to understand in depth the nutrition status of CLD patients using subjective global assessment tool and correlate it with the laboratory and clinical findings of the patients.

The results of our study demonstrates that as the age increases, the prevalence of malnutrition also increases in patients with CLD. Several previous studies have also shown that nutritional status get deteriorate with geriatric problems such as anorexia, dental problem and other chronic diseases.<sup>13</sup>

In prevalence of malnutrition in our study was 44.6% (mild/moderately malnourished) whereas international studies done by Vieira PM et al and Saleh MA et al showed prevalence in the range of 61.5% and 64% respectively.<sup>12-13</sup> Similar findings were also seen in a study done by Sasidharan M et al in Mumbai, India that showed a 68.5% prevalence of malnutrition in the study population.<sup>14</sup> However, a study done by Singh N et al showed the prevalence of malnutrition in their study population to be as high as 88%.<sup>15</sup> The difference in the statistics in our study and other studies could be due to the fact that our study was done on stable ambulatory CLD patients who attended medicine OPD on regular basis.

No statistically significant difference between gender and degree of malnutrition was found as assessed by the SGA tool (P= 0.58). This finding is consistent with the finding of Alberino F et al, 2001, who found that sex has no role in the development of malnutrition in hepatic patients.<sup>16</sup>

In relating to the aetiology of CLD to the nutritional state of the patients, a greater frequency of diagnosis of malnourished patients in our study was observed in patients with alcoholic aetiology. The protein-energy malnutrition is a common complication in alcoholic liver disease and has a correlation with the disease severity.<sup>17-18</sup> A study done by Panagaria N et al found malnutrition to be a common finding, not only in patients with liver disease (irrespective of aetiology) but also in chronic alcoholics without liver disease.<sup>19</sup>

In the present study, another significant association was found between SGA and severity of CLD, with Child-Pugh score B having more frequency of malnourished patients. Similar findings were found in studies done by Tai ML et al 2010 and Figueiredo FA et al 2006 that showed a higher proportion of bad nutritional status (SGA grade C) in Child-Pugh C cirrhotic compared to Child-Pugh B cirrhotic patients.<sup>11,20</sup>

The laboratory parameters like haemoglobin/ TLC/ platelets, LFT, serum albumin, and PT/INR were drastically decreased in our study participants though it did not show any statistical difference. Whereas few previous studies have shown a statistically significant association between degree of malnutrition and deranged laboratory parameters.<sup>12,13,14,16</sup>

**Conclusion**

Malnutrition is more frequent and severe in alcohol related

CLD and increases with severity of CLD. Subjective global assessment is a simple yet comprehensive tool for assessment of malnutrition in CLD patients. Timely nutritional assessment and its proper management is an elementary yet impactful intervention for better prognosis of CLD patients.

**Limitations of the study:**

Firstly, SGA is a subjective tool for the measurement of malnutrition, and its assessment, as with ascites and encephalopathy, may differ amongst individual clinicians or centres. Secondly, it was a single-centric study with a limited sample size.

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