



ASSESSMENT OF NUTRITIONAL STATUS OF CIRRHOTIC PATIENTS IN AMRITSAR

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ABSTRACT **Aim:** To assess the nutritional status of liver cirrhosis patients in Amritsar. **Objectives:** To evaluate nutritional status of patients among ALD and NAFLD using combination of BMI (Body Mass Index), TSFT (Triceps Skinfold Thickness) and MAMC (Mid arm Muscle Circumference). Subjective Global Assessment (SGA) was determined for every patients by checking different features like history, physical appearance and SGA rating. Based on this evaluation, patients were classified into three categories: well nourished, moderately malnourished and severely malnourished. **Materials and Methods:** To assess the nutritional status among liver cirrhosis patients in both males and females, this study was conducted at Sri Guru Ram Dass Medical College and Hospital, Amritsar during period of August 2025 to January 2026 after getting ethical approval from ethical committee of SGRDIMS Amritsar. The diagnosis of cirrhosis was based on the medical history, physical examination, biochemical findings and imagistic methods (ultrasound and / or computed tomography). A series of 106 hospitalized patients with cirrhosis 73 male and 33 female, median age 46.00 (range 20-70 years). Etiology of liver disease was alcoholic liver disease in 66 male and NAFLD in both male and female that is 38%. Etiology of liver disease was alcoholic in 59, hepatitis B virus in 7% HCV in 15%. The evaluation of nutritional status was made by different methods. A detailed history was recorded with appetite, caloric intake, change in body weight. Subjective Global Assessment (SGA) of nutritional status was determined for every patient. **Conclusions:** Malnutrition was correlated with clinical severity of liver disease. The mild Malnutrition was correlated with clinical severity of liver disease. The mild-moderate malnourished patients are 33 Child B, over 22 with viral etiology. About 59 from these patients are alcoholic and only 11 have Child C score ($p < 0.01$). In severely malnourished group 18 have alcoholic liver disease and are Child C classification ($p < 0.01$). Triceps skinfold thickness (mm) and mid-arm circumference (cm) decrease significantly according to the Child score, a positive correlation was found between these two parameters and the severity of cirrhosis.

KEYWORDS : Anaemia, Anthropometry, Cirrhosis Of Liver, Subjective Global Assessment, Child-Pugh Score

INTRODUCTION

Cirrhosis is an end-stage liver disease resulting from chronic liver injury due to a variety of causes, including viral hepatitis, alcohol consumption, and non-alcoholic fatty liver disease (NAFLD)^{1,2,3}. It is characterized by fibrosis and the replacement of normal liver architecture with regenerative nodules, leading to liver dysfunction. Biochemical markers and nutritional deficiencies are critical in assessing the severity of cirrhosis and guiding therapeutic interventions⁴. The liver plays a central role in various metabolic processes, including protein synthesis, iron storage, and vitamin metabolism. In cirrhosis, these functions are significantly impaired, leading to a cascade of metabolic derangements⁵. Iron overload, hypoalbuminemia, and vitamin B12 deficiency are frequently observed in cirrhotic patients and are associated with disease progression and poor outcomes^{6,7}.

Nutritional assessment is the systematic process of collecting and interpreting information that allows systematic assessment of the overall nutritional status of patients⁷. Chronic liver diseases frequently advance to cirrhosis. In wealthier nations, the leading causes of cirrhosis are hepatitis C virus (HCV), alcoholic liver disease due to excessive drinking, and nonalcoholic steatohepatitis (NASH). In contrast, hepatitis B virus (HBV) and HCV dominate as the primary causes in less-developed regions. Liver cirrhosis is associated with both direct complications of the loss of liver function and portal hypertension, such as jaundice, encephalopathy, or variceal hemorrhage and indirect complications like hepatorenal syndrome, hepatocellular carcinoma, or infections⁸. These complications of cirrhosis lead to high morbidity and mortality, thus making this disease a major cause of global health burden. According to the Global Burden of Disease 2010 study, liver cirrhosis was the cause of 1.2% of the global Disability-Adjusted Life Years, and 2% of all deaths worldwide in year 2010^{9,10}. In India as well, the risk factors of cirrhosis have varied among various studies conducted in different geographical areas. Data on the etiological aspects of cirrhosis of the liver from Punjab, a northern Indian state, are insufficient. This study aimed to evaluate the etiological profile of patients with cirrhosis admitted to a tertiary care institute in Punjab, India.

MATERIALS AND METHODS

The present study was conducted in Sri Guru Ram Dass Medical college and hospital, Amritsar with patients with cirrhosis of liver from

both OPD and IPD departments. After getting approval from Ethical committee of SGRDIMS Amritsar, the present study was conducted between period of August 2025 to January 2026 on the patients of alcoholic liver disease and non-alcoholic fatty liver disease in both males and females. In this study two groups were created and analyzed statistically by using latest version SPSS 27 for anthropometry and anaemia levels. group 1 comprises of patients with alcoholic habits and group 2 comprises of non alcoholic status.

Inclusion Criteria

1. All confirmed cases with cirrhosis of liver with clinical, biochemical and radiological evaluation.
2. Patients with age group between 20 yrs to 70 yrs
3. Study include both males and females who have compliance to dietary recommendations and medical treatment

Exclusion Criteria

1. Patients on drugs which cause in defect parameters such as glucocorticoids, OCP, aspirin and synthetic estrogen
2. Pregnant ladies
3. Any previous history of hematological and coagulation disorders other than CLD.

All patients signed an informed consent. Those who were in a poor condition did not agree to the study, that's why many patients had Child A score and statistical analysis are not relevant for statistical significance. The diagnosis of cirrhosis was based on medical history, physical examination, biochemical findings and imagistic methods (ultrasound and / or computed tomography).

A series of 106 hospitalized patients with cirrhosis 79% male and 26% female, median age 46.00 (range 20-70 years). The etiology of liver disease was alcoholic in 63%, 15% HCV and 7% had HBV and 24% were drug induced.

Clinical variables recorded were degree of encephalopathy (none, grade 1-2, grade 3-4), degree of ascites (absent, slight or moderate) based on the clinical or ultrasound data. The laboratory data collected included cell blood count (CBC), bilirubin, albumin, prothrombin time (PT), serum ammonium, International Normalized Ratio (INR), serum urea, serum creatinine, which were used to calculate CTP score; all markers were measured by standard laboratory methods.

The evaluation of nutritional status was made by different methods. A detailed history was recorded with appetite, caloric intake, change in body weight. Subjective Global Assessment (SGA) of nutritional status was determined for every patient. It is sometimes more useful than objective measurers for identifying individuals at nutritional risk because in patients with cirrhosis weight and biochemical values vary with the severity of liver disease independently from nutritional status.

The features of subjective global assessment are history, physical evaluation and SGA rating. The history includes weight change, dietary intake, gastrointestinal symptoms, functional capacity of work and other disease.

Based on this evaluation, patients were classified into three groups: well, moderately malnourished and severely malnourished. The nutritional status was evaluated also using of combination of BMI (Body Mass Index), MUAC (Mid upper arm circumference)TSF (triceps skinfold thickness) and MAMC (mid-arm muscle circumference).

RESULTS

A total of one hundred and six patients were enrolled for this study with written consent and after fulfilling eligibility criteria. At the end of this study only one hundred patients were alive and six patients had died who followed in out patient gastroenterology department at hospital.

Table1. Demographic Profile of Study Population: Patient's Characteristics Count (% age) Age Median (yrs) 46 and Mean Age(yrs) 47.82

Gender	Male	75%
	Female	25%
Drugs	Yes	24%
	No	76
BMI Category		
	Low	7%
	Normal	31%
	High	62%
Hepatitis B	Yes	7%
	No.	93%
Hepatitis C	Yes	15%
	No	85%
Disease	ALD	63%
	NAFLD	37%
MUAC Classification	Severely malnourished	3%
	Mild malnourished	2%
	Normal	30%
	Overweight	40%
	Obese	24%
MAMC Classification	Severely malnourished	4%
	Mild malnourished	4%
	Normal	30%
	Overweight	40%
	Obese	23%
TSF Classification	Severely malnourished	8%
	Mild malnourished	7%
	Normal	29%
	Overweight	29%
	Obese	36%
Obesity	Yes	64%
	No	36%
SGA Classification	Well Nourished	61%
	Moderately malnourished	21%
	Severely malnourished	18%
Child Pugh Score CTP	CTP A	56%
	CTP B	33%
	CTP C	11%

Table1: shows total one hundred six patients were enrolled (male 75% and female 25%) ranging from age group 30 to 70 yrs mean age 47.82 yrs, alcohol consumption in 63% and naflid among 37%, around 7% patients were suffering from Viral hepatitis B and 15% were from hepatitis C virus. About 7% patients were from low BMI category, 31% normal while 62% were falling under high BMI that is obesity. If we consider SGA classification of the patients then 61% were well nourished, 21% were moderately malnourished and 18% were severely malnourished who were at high risk of mortality and morbidity.

According to severity of diseases patients were divided in three categories based on child pugh score CTP Score was CTP A in 56%, CTP B in 33% and CTP C in 11%. According to anthropometric measurements there were three parameters: MUAC, MAMC and TSF (severely malnourished, moderately malnourished, normal, overweight and obese) as per shown in Table1.

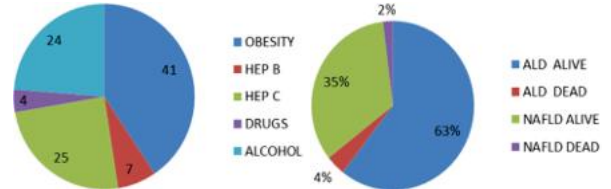


Fig. 1

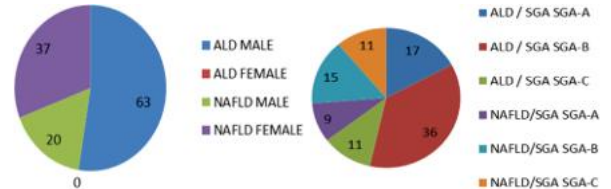


Fig. 2

Fig. 3

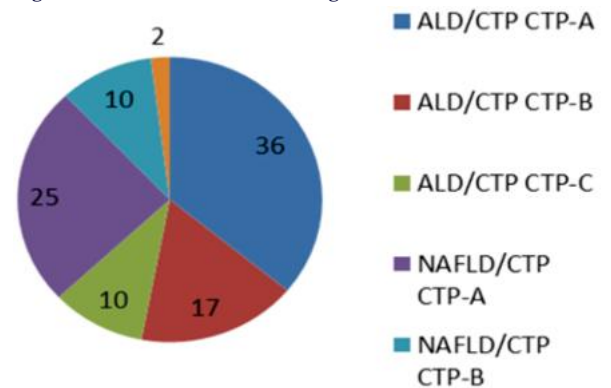


Fig. 5

Table 2: Association Between Severity of Disease in ALD with Various Anthropometric Measurements, SGA Classification and CTP Scores

ALD WITH	X2 chi square	P value
BMI	0.46	0.31
MUAC	3.5	0.79
TSF	2.1	0.73
MAMC	3.6	0.43
SGA	4.9	0.14
CTP	6.71	0.01

Table 3: Association Between Obesity with Severity of Disease Among NAFLD

HIGH BMI/OBESITY WITH	X2 chi square	P value
CTP-BMI	4.6	0.02
CTP-MUAC	14.20	0.001
CTP-TSF	11.6	0.05
CTP-MAMC	19.7	0.01
CTP-SGA	12.6	0.001

While studying for anthropometric measurements it was seen that patients with liver cirrhosis had low BMI and normal and high was 7%, 31% and 62% respectively. When further parameters were checked it was found that MUAC were 3% with severe malnourished, 2% in mild malnourishment, 30% with normal, 40% with overweight and 22% with obese category. On the other side severely malnourished were 4%, moderately malnourished in 4%, 28% with normal, 39% with overweight and 23% with obese MAMC measurements. Total skinfold thickness (TSFT) were also 8% in severely malnourished, 7% in moderately malnourished, 29% in normal, 28% in overweight and 35% were in obese patients.

Regarding etiology of disease it was found that Liver disease was caused due to obesity in 41%, HEP B was one of the cause in 7%, Hep C in 25%, Drugs were also part of CLD among 4% and alcohol was major contributing factor of ALD in 24% patients. (fig1)

During the whole study total 4 patients died due to severity of disease. 3 patients were from ALD and 1 patient was with NAFLD. Mortality rate is high with progression of disease. (fig2)

When patients were divided according to alcohol consumption in both groups of male and female it was found that 63% male had alcohol consumption while 20% had NAFLD, they had never consumed alcohol in any form. While there was no single female patient who was alcoholic, the cause of the NAFLD was either high BMI that is obesity or due to viral infections that is Hep B and Hep C virus. (fig3)

Figure 4 shows prevalence SGA classification in both groups of patients with ALD and NAFLD. Regarding Subjective global assessment (SGA) showed us patients being referred as ALD were well nourished (A) 17%, patients being moderately malnourished (B) 36% and 11% were severely malnourished. There was a significant association found between SGA and severity of disease at ($p < 0.001$).

Figure 5 also depicts severity of liver disease according to Child pugh score that was CTP A, B and C. There was association seen between child pugh score (CTP) and severity of alcoholic liver disease. Among ALD patients about 36% had CTP score A, 17% had CTP score B and only 10% had CTP score C in this study. If we refer to patients with NAFLD, there were 25% patients who had CTP score A, 10% were under CTP class B and 2% were CTP class C.

To evaluate the impact of ALD it was compared with prevalence of obesity, SGA classification and CTP scores, low BMI was more prevalent in patients with CTP B and CTP C scores at ($X^2-4.9$ $P=0.01$). Data regarding TSF ($X^2-2.1$, $p=0.23$), MUAC ($X^2=3.5$, $p=0.99$), MAMC ($X^2-3.6$, $p=0.42$). The proportion of patients with CTP B and CTP C were more prone to malnourishment. (Table 2)

There was strong association seen between NAFLD and Severity of disease with respect to malnutrition and nutritional status assessment. High BMI mean more patients were in NAFLD category with CTP score B and C at ($X^2-4.6$, $p=0.02$), While MUAC was less significant to severity of malnourishment in NAFLD at ($X^2-14.20$, $p=0.001$), TSF also a single contributing factor with no association with severity of liver disease where ($X^2-11.6$, $p=0.05$), MAMC at less significant at ($X^2-19.7$, $p=0.01$). SGA score was showing no significance with CTP classification at ($X^2-12.6$, $p=0.001$). Table 3.

DISCUSSION

Malnutrition is a common complication of liver disease being associated with adverse prognosis if left untreated. It is critically important to assess the nutritional status of all CLD patients and to optimize and monitor right kind of nutritional approach, maintaining adequate protein and calorie intake and also correcting nutritional deficiencies.¹¹

A total one hundred and six patients were enrolled and signalled as high nutritional risk and followed in gastroenterology department ward where patients got admission due to acute decompensation. Nutritional assessment was performed by using various validated tools namely anthropometric measurements, SGA and child pugh score. Around 61% patients were well nourished, 21% were moderately malnourished and 18% were severely malnourished under SGA. While considering MUAC 5% were severely malnourished, according to TSF around 8% were moderately malnourished and MAMC also showed 15% were moderately malnourished. The patients presented with alcoholic habits and viral diseases (Hep B and C) were associated with severity of protein calorie malnutrition positively. The severity of disease was also defined with help of various other parameters like BMI, MUAC, TSF and MAMC. During the study it was seen that total 2% was mortality rate according to progression of disease with most patients had advanced liver disease and moderate to severe malnutrition according to SGA.

However, it was realised that more and more advance tools may help to detect early onset of malnutrition in these patients like some functional tests like hand dynamometry, bioimpedance and indirect calorimetry etc. Timely diagnosis and treatment may help to recover early and prognosis can be improved slowly.

CONCLUSION

With this study, protein calorie malnutrition is more prevalent in CLD patients both with ALD and NAFLD. Malnutrition was correlated with clinical severity of liver disease. The mild to moderate malnourished

patients are child CTP B with viral etiology. it was concluded that Alcohol consumption may play a very important role in severity of this disease. Nutritional status assessment in hospitalized patients may contribute to better outcome of recovery. TSF and SGA are more efficient tool to be used to evaluate parameters. More studies are required in near future to provide more accurate routine care and recovery from disease.

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