DOI: https://doi.org/10.54393/df.v1i02.33

DIET FACTOR
Journal of Nutritional & Food Sciences
https://www.dietfactor.com.pk/index.php/df
Volume 1 , Issue 2 (Jul-Dec 2020)

Original Article

Nutritional Assessment of Liver Cirrhosis Patients Visiting Public Hospital, Lahore

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Keywords: liver cirrhosis, hepatitis C, nutrition

How to Cite:
Fatima, I., Aslam, M., Asif, H., Kabir, M., & Hayee, S. (2020). Nutritional Assessment of Liver Cirrhosis Patients Visiting Public Hospital, Lahore. *DIET FACTOR (Journal of Nutritional &Amp; Food Sciences), 1*(02). https://doi.org/10.54393/df.v1i02.33

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Article History
Received: 13th November 2020
Accepted: 18th December 2020
Published: 30th December 2020

ABSTRACT

Cirrhosis is defined as the development of regenerative nodules surrounded by fibrous bands and inflammation of liver, which can cause portal hypertension or hepatic insufficiency that causes jaundice, hepatic encephalopathy or various complications**.** The important function of liver is to maintain the body metabolic homeostasis. It also helps in protein, carbohydrate, and fat metabolism, due to which the diet of a person is fully affected **Objective:** To assess the nutritional status of liver cirrhosis patients, visiting Public Hospitals, Lahore **Methods:** A cross-sectional study was performed at Sir Ganga Ram Hospital Lahore, for a period of 4 months and 100 patients of liver cirrhosis were selected by non-probability convenient sampling to conduct the study. **Results:** Of total 100 patients, 53% were males and 47% were females. The mean of age, body mass index and calories intake were (53.17±18.414), (19.12±4.743) and (544.88±437.195). Out of 100 patients only 7% of the patients were nourished, 58% are malnourished, and 35% patients were severely malnourished. Mostly patients were malnourished and lost weight due to disease. The mean BMI of patients was19.12±4.743, which shows that mostly patients were malnourished and undernourished. Sarcopenia was common in patients suffering from liver cirrhosis. **Conclusions:** Cirrhosis is complication of liver disease that involves loss of liver cells and irreversible scarring of the liver. It is more prevalent in males as compared to females.

INTRODUCTION

Cirrhosis is defined as the development of regenerative nodules surrounded by fibrous bands and inflammation of liver, which can cause portal hypertension or hepatic insufficiency that causes jaundice, hepatic encephalopathy or various complications [1]. The important function of liver is to maintain the body metabolic homeostasis. It also helps in protein, carbohydrate, and fat metabolism, due to which the diet of a person is fully affected [2]. The incidence of chronic liver disease (CLD) in the United States was estimated as 0.27%. 69% of people reported that they were unaware of their disease. The incidence of liver cirrhosis is getting higher day by day because of unawareness. Mostly it is not diagnosed timely, and people only focus on the management of diabetes, alcohol intake, or viral hepatitis [3]. The signs and symptoms of liver cirrhosis include ascites, wasted extremities, sepsis, hepatic encephalopathy and non-obstructive jaundice. Other symptoms include shrunken liver, splenomegaly, and peripheral edema, loss of appetite, weakness, malaise and evidence of portosystemic collaterals. Other complications include malnutrition, gastrointestinal bleeding, pruritus, infections and muscle cramps [4]. Muscle wasting means decrease in muscle mass. About 40% of people develop muscle depletion due to cirrhosis. It's incidence increases with severity of disease [5]. Branched chain amino acid, high fiber, high protein diet is recommended to the patients having liver cirrhosis. These food practices help to increase muscle mass and does not raise ammonia or glucose level in the body. It also helps to improve hepatic encephalopathy [6].

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The patient should be administered by daily 35–40 kcal/kg body weight of calories and 1.2–1.5 g/kg of protein. It should be noticed that protein intake in increased during caloric restriction. In ascites, sodium intake should be of 2g or 88mmol/day. After documentation, any nutritional deficiencies should be corrected by multivitamins such as vitamin D, iron, and zinc. For both obese and non-obese cirrhotic patients, it would be corrected with branched chain amino acids [7]. Childhood obesity increases the risk of early development of nonalcoholic liver disease which can also lead towards carcinogenesis. A study conducted by Berentzen TL *et al.*, comprised of 285884 boys and girls who attended schools. Their height and weight were measured by doctors and nurses at the age of 7-13 years. Higher BMI in childhood also increases the risk of liver cancer in adult life [8]. Shiraki M *et al*, conducted a study to examine the BMI of cirrhotic patients. This study included 294 cirrhotic patients. 171 were males and 123 were females. The mean BMI was 23.1±3.4kg/m^2 and 31 showed obesity. Patients without edema or HCC, mean BMI was 23.6±3.6 and 34% had obesity. Serum albumin in protein energy malnutrition was less than 3.5g/dl and energy malnutrition were 0.85, as 61% and 43% while protein-energy malnutrition was 27% in all patients. In patients without HCC each proportion was 76%, 48% and 30%. quality of life was not good in all patients [9].

A study was conducted by Liu B *et al.*, to find out the BMI in females of United Kingdom who were taking alcohol on daily basis. 1181 were hospitalized or died with liver cirrhosis. Among women having BMI of 22.5 or above, BMI also increased with the increasing incidence of liver cirrhosis. Their risk increased by 28 folds, but the incidence of increasing liver cirrhosis in BMI did not differ according to alcohol consumed, but its risk increases. Those women who consume less than 70g alcohol per week, the risk of liver cirrhosis per 1000 women was 0.8 for women with BMI of 22.5 and 25 are 1.00 for those with the BMI of 30 or more. Among women who reported drinking 150 g alcohol or more per week, the corresponding figures were 2.7. So, he concluded that excess body intake increases the incidence of liver cirrhosis [10].

Elevation of liver functioning test was reported with the use of tumor necrosis factor inhibitors. 6861 patients with 22, 522 determinations were assessed. The elevation of LFT with TNF use were seen in 5.9% of AST/ALT determinations and abnormalities. The incidence of LFT elevation>1 with TNF-1 was uncommon. Abnormality>2 was rarely observed [11-13]. Obesity and metabolic syndrome is a common issue in liver cirrhosis patients. Metabolic syndromes and obesity are responsible for non-alcoholic fatty liver disease (NAFLD) [14-16]. It happens due, to accumulation of triglyceride which cause hepatic inflammation and may results in cirrhosis. Obese people are more prone to primary liver malignancies, and with increased BMI, which tells us about decompensation of liver cirrhosis. In cirrhotic patient's diet should be water and fat soluble because these patients are at higher risk for depletion. Trace elements can also be given. In follow up, we monitor the diet especially of protein and physical activities carefully [17].

Assessment of nutritional status, malnutrition and its treatment in liver arouses important. Management of malnutrition can be conducted in two forms, firstly by identifying the disease from which the patient presents, and secondly to treat the patient with fluids therapy. The patients should take oral fluids or using other oral supplements, parenteral and enteral diet. In patients with liver arouses diet is most important. Inadequate diet can increase the severity of disease and can lead to liver cirrhosis. The recommended dose should be about 35-40 kcal/kg/day [18].

Nutritional deficiencies are common in cirrhotic patients. Craig J. McClain defines the nutrition of those patients. Their Assessment is very difficult because the standard test that is used to evaluate the nutritional status of liver patient visceral proteins such as retinal binding protein and albumin is used protein altered by liver disease because they are produced in liver. Another test is skin fold thickness, mostly edema occur with liver cirrhosis and can affect skin fold thickness, best test is the subjective global assessment which evaluate nutritional status based on patient's medical history, and physical examination. Then rate him/her on the scale of malnutrition are well nourished [19].

METHODS

A cross sectional study was conducted at indoor and outdoor patients of both gender at Sir Ganga Ram Hospital Lahore. Data were taken through direct interview with patients or their care taker in a formal sitting sample size of 100 was taken by using convenient sampling technique. For the collection of data, questionnaire containing demographics of the study participants was developed for keeping record. Study was completed during 6 months from Jan 2019 to July 2019. Study with 100 sample size was conducted for the verification of literature review. Questions were asked from patients and their care taker regarding their dietary intake habits. They were also asked about their BMI and SGA rating for the assessment of nutritional deficiencies. Answers were in the form of yes or no. Their mean was calculated by using SPSS latest version.

RESULTS

Mean BMI of patients was 15.84±2.299, age was 53.17±18.414 as shown in table 1. Results showed that mean value of

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calories of liver cirrhosis patients was 544.88±437.195, mean value for age was 53.17±18.414 as shown in table 2. Mean values of creatinine is 1.724±.5753, bilirubin .971±1.1159, ALT 40.69±24.12, AST 54.99±33.280, and phosphatase 138.47±95.708 as shown in table 3. Results showed that 58% patients were malnourished, 35%were severely malnourished and only 7% were nourished as shown in table 4.

Variables	Mean ± SD	Maximum	Minimum
Height (cm)	1.70±.09650	1.54	1.87
Usual weight(kg)	62.63±13.990	120	39
Current weight(kg)	55.01±14.522	95	31
BMI(kg/m^2)	19.12±4.743	33	10

Table 1: Mean of anthropometric measures of liver cirrhosis patients

Variables	Mean value	Maximum value	Minimum value
Calories	544.88±437.195	1534	0
Age	53.17±18.414	97	12

Table 2: Mean of calories and age of liver cirrhosis patients

Biochemical values	Mean ± SD	Maximum	Minimum
Creatinine	1.724±.5753	7.2mg/dl	1.2mg/dl
Bilirubin	.971±1.1159	7.3mg/dl	.1mg/dl
ALT	40.69±24.12	105.00U/L	12.00U/L
AST	54.99±33.280	152.00U/L	7.00U/L
Phosphatase	138.47±95.708	400mg/dl	4.00mg/dl

Table 3: Mean of liver functioning test

Sr.no	Nutritional status	Frequency
1.	Nourished	7
2.	Well nourished	0
3.	Malnourished	58
4.	Severely malnourished	35

Table 4: Frequency distribution of cirrhotic patients according to nutritional status

DISCUSSION

Assessment of malnutrition is important in liver cirrhosis. According to the study 58% of the patients were malnourished while 35% are severely malnourished. According to a study 88% patients were mild and moderate malnourished. In severely malnourished group, 43% patients were alcoholic and 31 were Child C classification [20]. A survey was conducted on patients having liver cirrhosis to find out the ratio of disease in males and females. According to that survey males were more affected then females. The ratio of males was 53 whereas females was 47. This shows males are more prone to disease as compared to females. According to another study, the ratio of disease was examined, out of 3014 patients 1289 patients were male. This also shows that male patients are at high risk of disease as compared to females[4]. The mean BMI of patients was 15.84±2.299 . according to a study conducted to measure the BMI of patients suffering from liver cirrhosis. Mean BMI was 23.1±3.4kg/m^2 and 31 shows obesity. There is no relevance in both studies [21]. Obesity and metabolic syndrome is a common issue in liver cirrhosis patients. In one study, the mean of weight was 55.01±14.522, but it is in contrast to another study which shows that obesity is a common issue in patients suffering from liver cirrhosis. It denies the concept of obesity in these patients. Caloric intake is a main issue in patients suffering from liver cirrhosis. As mostly patients were malnourished due to which their caloric intake should be high. According to one study, patients were not taking recommended the amount of calories. The mean of their caloric intake is 544.88±437.195. A study was conducted to define

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the caloric intake of cirrhotic patients. According to it, the recommended dose should be 35-40kcal/kg/ day. Patients were not taking the recommended dose of calories [21].

CONCLUSIONS

Liver cirrhosis was observed to be frequent in males as compared to females in the current study. It may be due to more usage of substance abuse in them.

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