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Evaluating the impact of early nutritional assessment and intervention in hospitalized liver cirrhosis patients

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ABSTRACT – **Background** – Malnutrition is common in liver cirrhosis patients that is correlated with early complications, morbidity and mortality. **Objective** – The purpose of the study was to assess nutritional status, impact of nutritional screening and intervention in liver cirrhosis patients by evaluating their actual energy and protein intake during hospital stay. **Methods** – A cross sectional study was conducted wherein all patients' nutritional status was defined by Subjective Global Assessment tool. Adequate energy and protein supply were planned and executed by using individualized nutritional plan for patients with dietitian's collaboration. Anthropometric measurements included height, weight, body mass index, mid upper arm circumference, hand grip strength and triceps skin-fold thickness. Biochemical tests included haemoglobin, mean corpuscular haemoglobin, volume and concentration, albumin and liver function tests. To record the daily food intake, a 24-hour dietary recall was used. **Results** – Overall 83 patients (mean age 55) were included, among them 46% of patients were moderately malnourished, 12% were normal, while 42% of cirrhotic patients were severely depleted according to Subjective Global Assessment. The mean intake of calories and protein was improved during stay in hospital after nutritional intervention and critical monitoring (P<0.05). Anthropometric measurements at baseline and discharge showed significant differences (P <0.05) in weight, body mass index, triceps skin fold thickness and mid upper arm circumference values, but not in hand grip strength that was associated with malnourishment among patients. **Conclusion** – Providing individualized nutritional intervention and its monitoring by qualified dietitians during hospital stay helps to improve intake in patients that prevent further risk of malnutrition and related complications.

Keywords – Cirrhosis; dietary intake; malnutrition; nutrition assessment; nutritional intervention.

INTRODUCTION

The prevalence of protein energy malnutrition in liver cirrhosis patients has been devastatingly high during the past years. Data available from the year 2010 represents more than one million deaths caused due to liver cirrhosis worldwide[1]. Malnutrition is one of the contributing factors that enhances the chance of severe complications in liver cirrhosis patients. In the year 2012, the prevalence of protein-energy malnutrition has reached 50 to 90 % in liver cirrhosis patients[2].

Major etiological factors of liver cirrhosis include chronic hepatitis (particularly hepatitis B and C), liver steatosis, alcoholic liver disease, non-alcoholic steatohepatitis and non-alcoholic fatty liver disease (NAFLD). All these persistent conditions lead to progressive chronic liver disease, liver cirrhosis and end stage liver disease. In Pakistan, the prevalence of acute and chronic hepatitis (B and C) has been tremendously increased[3]. According to World Health Organization (WHO), there are approximately 12 million hepatitis patients and 150,000 newly diagnosed patients of hepatitis each year.

Nutritional status of majority of liver cirrhosis patients is compromised due to various contributing factors like anorexia, early satiety, excessive alcohol consumption, maldigestion, malabsorption and poor quality of diet. Inadequate dietary intake in cirrhosis patients is also linked with the altered taste, possibly due to certain medications and anorexia. Other factors for decreased oral intake include hepatic encephalopathy, ascites, abdominal distention, dietary restrictions and starvation for various tests and procedures[4].

Liver cirrhosis patients with altered nutritional status have longer duration of hospital stays as compared to normal patients. In patients with advanced liver disease there is visible loss of fat mass and muscle mass[5]. Malnutrition is a critical issue due to lack of nutritional care in clinical practice in Pakistan. From the onset of disease restricted diet, low socioeconomic status, less nutritional awareness and inadequate oral intake lead to malnutrition that additionally worsens the disease condition and develop early complications.

According to ESPEN (European Society of Clinical Nutrition and Metabolism) 2006, identification of malnutrition in cirrhosis patients can be assessed by using various tools including Subjective Global Assessment (SGA), hand grip strength and anthropometric analysis[2]. Hand grip strength is non-invasive and easy tool to assess nutritional and functional status of patients by detection of loss of muscle strength[6].

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Different strategies should be planned to improve nutritional status of hospitalized liver cirrhosis patients. Delivery of adequate supply of nutrition regarding macronutrients and micronutrients will help to improve the nutritional status and decrease the rate of complications. The recommended daily intake of macronutrients for patients with liver cirrhosis has been approved by ESPEN Guidelines on enteral nutrition specifically for liver disease. Cirrhosis patients should consume adequate amount of energy calculated as 35–40 kcal/kg body weight/day, similarly the daily protein requirements for liver cirrhosis patients is 1.2–1.5 g/kg body weight[7]. According to the guidelines, in condition of inadequate oral intake regardless of nutritional counselling all patients should be provided with Oral Nutritional Support (ONS). Advanced liver disease patients with malnutrition should be provided with enteral nutrition in transitions of oral feeding to fulfil energy and protein requirements and decrease malnutrition effects on complications[8].

Main aim of this study was to assess the nutritional status of cirrhotic patients admitted in hospital at first stage and then apply individualized medical nutrition therapy. Further we compared actual energy and protein intake with standard requirements of hospitalized liver cirrhosis patients.

METHODS

Study was approved by the Institutional Review Committee for Biomedical Research of University of Veterinary and Animal Sciences, Lahore. Site of study was Department of Gastroenterology and Liver Transplant of Sheikh Zaid Hospital in Lahore from July 2018 to January 2019. A total of 100 adult liver cirrhosis patients participated in the study after giving written and verbal consent. Inclusion criteria of the study was patients aged >40 years suffering with liver cirrhosis. Patients with critical conditions, those who needed mechanical ventilation and/or with chronic heart failure (chronic heart failure is an independent cause of mortality so that co-morbidity factors can be diverse with liver cirrhosis) were excluded from the study.

Anthropometric measurements weight, height, mid upper arm circumference (MAUC), triceps skin fold thickness (TSF) and hand grip strength were weekly recorded for each individual patient until discharge. Weight of the patient was measured using a weighing scale with accuracy of 0.1 kg. The patient's height was measured using stadiometer or tape measurement with accuracy of 0.1 cm. Body mass index (BMI) was calculated by using estimated dry weight of the patients following by ascites and paracentesis by Mendenhall, 1992. Mid upper arm circumference (MUAC) was measured using measuring tape with accuracy of 0.1 cm. In order to measure skin fold thickness, first mid arm circumference measured between the olecranon and acromial processes by using a measuring tape with accuracy of 0.1 cm, then on the marked point from the surface of triceps patient's subcutaneous fat was pulled off and measured using a skin fold thickness calliper with accuracy of 1 mm[9].

Hand grip strength shows the maximum strength derived from the contraction of both intrinsic and extrinsic muscles of hand. Hand grip strength of the patients was assessed by using hand grip dynamometer (phisiopadic hand grip dand, China).

Subjective global assessment is one of the most commonly used tools to assess nutritional status of liver disease patients. It is non-invasive, inexpensive and easy tool to assess the extent of malnutrition in liver cirrhosis patients[10]. SGA is further categorized in various portions including dietary intake, weight change, signs and symptoms and functional capacity. SGA classified the data in three types; normally nourished, moderately malnourished and severely malnourished as A, B and C groups respectively.

Biochemical parameters of patients included haemoglobin (Hb), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), albumin, liver function tests (ALT, AST) were measured at baseline as well as at end of the study. Blood glucose level and blood pressure was also recorded at proposed interval. All biochemical tests values were taken from hospital record of each patient.

The 24-hour dietary recall is an easy method to assess dietary intake of population[11]. It consists of all the foods and beverages consumed in duration of last 24 hours. A 24-hour dietary recall was taken from participants on day 1, day 3, day 7 of assessment and on discharge day.

All patients' nutritional status was assessed using Subjective Global Assessment and BMI. Adequate energy and protein supply were planned according to ESPEN guidelines for individual patients. Advice on supplemental formulas, enteral or parenteral nutrition when appropriate with dietitian's collaboration in the hospital was also provided. Cirrhotic patients were recommended with supplemental formulas to achieve their optimum protein and energy requirements. Approximately these formulas provide 7 g of protein per serving which leads to an increased total intake of patients. Some other supplements provide an adequate amount of energy (250 kcal), protein (9 g), fats (9 g) and carbohydrates (34 g) per serving. The formulas were also loaded with multiple minerals and vitamins. Thus, these formulas were of great importance due to rich nutritional constituent that helps patients to restore their nutritional status. Individualized patient's energy requirements were determined by using Harris Benedict's Equation[12]. Patient's protein requirements were advised based on standard amount that is 0.8–1.2 g/kg body weight or 1.2–1.5 g/kg body weight. All patients were followed up on day 1, 3, and 7 until discharge[8]. Patients were critically monitored on alternative days for their intake and supplementation use. Appropriate nutrition education was given to the patients regarding their dietary intake and nutritional status with collaboration of dietitian in the hospital. Descriptive statistics on the data was presented as mean and standard deviation. Baseline data (day 1) of anthropometry was compared with data on discharge by using paired sample *t* test in order to find difference after the medical nutrition therapy during hospital stay. Analysis of variance (ANOVA) was applied to find statistical significance in mean intake of patients at different intervals. Chi square test was applied to find out association between different parameters. All these tests were performed by using SPSS version 21 software (IBM Corporation). $P<0.05$ was statistically significant.

RESULTS

A total of 100 individuals participated in this study and 83 (83%) patients completed the study and shared information on their discharge from hospital while 13 participants left and did not provide appropriate information on discharge day. Death of few patients (n=04) was reported during the study. The average age of included participants was 55 years among them 60% of patients were male as showed in baseline characteristics (TABLE 1).

TABLE 1. Baseline characteristics of liver cirrhosis patients on hospital admission (n=83).

Baseline Characteristics	Mean ± SD
Age (years)	55±9.2
Weight (kilogram)	68±13.5
Height (inches)	65±2.1
BMI (kg/m^2)	24.5±4.8
MUAC (cm)	25±4.5
TSF (mm)	13.5±6.6
Blood glucose level (mg/dL)	197±89

SD: standard deviation; BMI: body mass index; MUAC: mid upper arm circumference; TSF: triceps skin fold thickness.

The present study was specifically planned to critically monitor the patients for the nutrition intervention in the duration of their hospital stay. Appropriate diet plans and nutrition education was provided to the patients after early nutritional screening. Patients were critically monitored on alternative days 1, 3, 7 and on discharge. Analysis of variance showed improvement in the macronutrients intake of patients recorded by 24-hour dietary recall. Post hoc test (TABLE 2) showed statistical significance in total calories and protein intake of patient till discharge.

Results (TABLE 3) were categorized on the basis of Subjective Global Assessment, patients were categorized into three groups according to SGA; normally nourished 12% (Category A), moderately malnourished 46% (Category B) and severely malnourished 42% (Category C). Outcomes explained that in severely malnourished patients, mean of BMI was improved from baseline to discharge while other anthropometric measurements (MUAC, TSF) were not much improved at the discharge. The BMI and MUAC values of normal patients were decreased at the discharge and no changes were recorded in the normal weight patients. Dietary intake of all patients (despite of SGA categorization) was improved at discharge where the calories and proteins intake increased. Liver function tests are important to assess medical condition and risks of liver complications, the results represented that the levels of ALT and AST in the blood were significantly reduced at the discharge.

After applying paired *t* test, results showed significant decrease (P<0.01) in the MUAC value of overall patients at discharge day compared to the baseline data. Significant reductions (P<0.02) were observed in the BMI and weight of patient at the discharge. Values of triceps TSF was also found statistical significant while hand grip strength showed no significant differences at the baseline and discharge day as stated in TABLE 4.

TABLE 2. Analysis of variance of mean caloric and protein intake of cirrhosis patients at different intervals of hospital stay.

Parameters	Day 1 Mean ± SE	Day 3 Mean ± SE	Day 7 Mean ± SE	Discharge Mean ± SE	*P* value
Total calories intake (kcal/day)	1030.83±57.99^c	1100.05±55.94^c	1391.57±46.48^b	1544.83±42.22^a	0.000*
Total protein intake (g/day)	35.10±2.69^c	39.20±2.62^c	56.55±2.43^b	64.73±2.11^a	0.000*

SE: standard error. *highly significant P value <0.05; $^{a, b, c}$ statistical difference between calories and protein intake at each interval by post hoc test.

TABLE 3. Mean of various parameters at baseline and discharge of participants categorized on the basis of body mass index.

Parameters	Normal		Moderately malnourished		Severe malnourished	
	Baseline Mean ± SD	Discharge Mean ± SD	Baseline Mean ± SD	Discharge Mean ± SD	Baseline Mean ± SD	Discharge Mean ± SD
Anthropometric measurements						
BMI (kg/m^2)	27.9±5.6	24.8±4.0	23.6±4.2	23.2±4.5	20.5±4.8	21.1±3.8
MUAC (cm)	26.7±4.9	25.6±4.1	22.6±3.9	23.3±3.9	20.2±6.0	20.8±4.4
TSF (mm)	15.9±9.3	13.6±5.2	10.4±6.5	11.5±6.1	9.5±5.0	9.7±6.9
Hand grip strength (force/kg)	16.5±17.4	15.6±9.0	15.7±15.5	15.8±17.8	13.9±15.2	12.5±16.2
Nutrients Intake						
Calories Intake (kcal/day)	1383.4±389.9	1742.5±333.9	1082.7±532.6	1510.1±365.1	917.2±473.9	1516.2±407.4
Protein Intake (g/day)	53.9±19.2	69.7±13.4	39.6±23.3	62.5±15.9	28.4±21.7	65.1±23.4
Biochemical parameters						
Haemoglobin (g/dl)	12.3±3.1	10.6±1.9	12.8±14.6	10.5±2.2	10.8±2.0	10.9±1.9
ALT (IU/L)	38.5±19.9	33.1±2.2	86.2±161.3	56.7±88.1	65.3±75.1	39.2±14.9
AST (IU/L)	58.4±40.1	49.7±20.3	78.6±102.1	58.3±52.9	105.8±107.6	45.5±20.7
Albumin (g/dL)	3.0±0.4	2.7±0.7	2.2±0.8	2.6±0.5	2.5±0.5	2.8±0.5

SD: standard deviation; BMI: body mass index; MUAC: mid upper arm circumference; TSF: triceps skin fold thickness; ALT: alanine aminotransferase; AST: aspartate aminotransferase.

TABLE 4. Mean comparison of anthropometric measurements at baseline and discharge of patients by using paired *t* test.

Parameters	Mean± SD (baseline)	Mean ± SD (discharge)	*P* value
Weight (kg)	68.54±13.90	67.13±12.03	0.001*
BMI (kg/m²)	24.78±4.93	24.27±4.16	0.002*
MUAC (cm)	25.43±4.46	24.82±4.16	0.000**
TSF (mm)	13.92±6.69	13.69±6.37	0.018*
Hand grip strength (force/kg)	15.02±16.26	14.98±16.23	0.940

SD: standard deviation; BMI: body mass index; MUAC: mid upper arm circumference; TSF: triceps skin fold thickness. *significant value, P value < 0.05, **highly significant value.

Subjective global assessment (SGA) covers the important parameters in evaluation that effect nutritional status like weight change, nutrient intake, GI symptoms and functional capacity. After applying chi square test, results showed that there was significant association between SGA scoring and nutrient intake (TABLE 5). Patients who were categorized as severely malnourished had minimal intake or fluid diet during previous days. Approximately 15% and 22% of moderately malnourished patients were taking inadequate or minimal nutrient intake, respectively. While, 47% severely malnourished patients were taking the minimal nutrient intake. There were no significant changes ($P>0.05$) in weight change according to SGA scoring. There was a significant association between functional capacity and SGA scoring represented that that patient who were severely malnourished had decrease functional capacity as compared to normally nourished patients.

DISCUSSION

Results of this study showed that approximately 42% of patients were malnourished classified according to Subjective Global Assessment tool. Previous study was conducted by Brazilian scientist Figueiredo FA et al. to assess nutritional status by using different tool in liver cirrhosis patients showed that 31.6% of patients were malnourished when assessed by using SGA, interpreting that early incidence of malnutrition in liver cirrhosis patients leads to increased complications, morbidity and mortality[13]. Results regarding prevalence of malnutrition in liver cirrhosis patients waiting for liver transplant showed that 35.6% patients of pre liver transplant were in Class C (severely malnourished) and 46.7% patients were in Class B (moderately malnourished) while 17.8% patients were normally nourished (Class A) assessed by SGA tool.

TABLE 5. Nutrition screening by using Subjective Global Assessment tool in liver cirrhosis patients.

Parameters / Defined variables	Category A% n=10	Category B % n=38	Category C % n=35	*P* value	X^2 value
Nutrient intake					
No change	4	1	0		
Inadequate	3	15	5	0.000*	42.214
Minimal intake	3	22	47		
Nutrient intake (past 2 weeks)					
Adequate	5	1	0		
Improved	4	31	7	0.000*	85.275
No improvement	1	6	45		
Weight change					
Less than 5%	8	31	47		
5 to 10%	2	5	3	0.451	3.682
>10%	0	2	1		
Weight change (past 2 weeks)					
Increased	1	2	1		
No change	6	21	26	0.658	2.427
Decreased	3	15	24		
GI symptoms					
None	1	2	0		
Mild	9	32	23	0.000*	23.240
Severe	0	4	24		
GI symptoms (past 2 weeks)					
Resolution	1	2	0		
Improving	7	22	1	0.000*	44.918
No improvement	2	14	46		
Functional capacity					
No dysfunction	5	12	2		
Difficulty in Ambulation	4	24	30	0.000*	26.578
Bed or chair	–	–	–		
Ridden	1	2	20		
Functional capacity (past 2 weeks)					
Improved	5	10	1		
No change	5	27	21	0.000*	45.024
Decreased	0	1	30		

Category A: normal; category B: moderately malnourished; category C: severely malnourished. *highly significant value, *P* value<0.05.

In liver cirrhosis patients' protein to energy ratio is an important concern to reduce frequency of malnutrition[14]. A study was conducted in Malaysian advanced cirrhosis patients showing lower caloric intake (mean value 15.2 /kg body weight per day) during hospitalization depicting it as one of the cause of malnutrition[15]. In the present study after critical monitoring of hospitalized patients regarding macronutrient intake results showed that there was significantly improvement in intake of patients during their stay, there was significant improvements on day 1, day 3, day 7 and discharge. Another study was conducted in stable liver cirrhosis patients to investigate the effect or oral diet on energy metabolism for short duration in Albert Chenevire Hospital, France. Results showed that mean calories and protein intake was improves in the patients ($P<0.01$)[16].

Protein intake of liver cirrhosis patients is another important concern. The improvement in dietary protein intake may be explained as during early days of hospitalization patients were having unstable clinical condition and inability to eat due to anorexia, nausea, vomiting and other GI symptoms and non-supplementation. On day 3 and day 7 patients were improving regarding medical condition and GI symptoms therefore patients were able to tolerate oral supplementation. While at discharge some patients were recovered resulting a mean increased in calories and protein intakes.

The results of this study were supported by a French scientist Campillo et al. that enhanced oral intake of cirrhosis patients (especially severely malnourished patients) for the duration of one month and observed changes in energy metabolism and other indices. Results showed improvement in the nutritional status of the patients assessed using creatinine height index, TSF, MAMC and total body fat mass. For biochemical parameters decrease in the level of C reactive protein (CRP) was reported. In this study there was change in patient's Child Pugh score after 1 month of dietary intervention and monitoring. Therefore, the study determined that increasing energy intake improved the nutritional status of severely malnourished patients and thus supported the patients to combat against disease and prevent further complications[17].

In order to completely assess nutritional status of the patient's, anthropometric measurements are also very noteworthy. Change in dry weight and other body measurements can be used as one of the monitoring parameters in liver cirrhosis patients. Body mass index is one of the indicators to assess nutritional status of liver patients, the mean of BMI of 24.7 kg/m^2 in patients in this study. Another study was conducted in Brazil to assess anthropometric measurements in patients of cirrhosis showed that the mean of BMI of patients was 28.5 kg/m^2, explaining that liver cirrhosis patients' gain more weight at this stage causing BMI ranges in overweight compared to normal BMI patients in present study[18]. To eradicate weight error due to ascites and edema in liver cirrhosis patients, in this study dry weight of patients was estimated to calculate as possible as accurate body mass index[19].

Another study was conducted in France to validate BMI for assessment of nutritional status in liver cirrhosis patients who were categorized as preserved nutritional status, moderately malnourished and severely malnourished based on their nutritional status. BMI in all the categories were 20.3 kg/m^2, 23.5 kg/m^2 and 27.2 kg/m^2 respectively. This displayed that patients who were severely malnourished had the least BMI as compared to other groups (moderately malnourished and normal nutritional status). As compared to current study, results were similar showing the least mean value of BMI in underweight patients and highest BMI in overweight/obese patients[20].

Other anthropometric parameters used in this study include mid upper arm circumference and triceps skin fold thickness. Results of the current study that was conducted in Pakistan showed that there is higher MUAC value for both genders than those reported by an Australian study conducted on hospitalized patients[21].

In results when triceps skin fold thickness distributed against gender parameter it represents that TSF values were higher in females compared to males. The higher TSF values depict higher fat mass that can relate to overweight and obesity. Almost 80% of female liver cirrhosis patients were in normal ranges depicting normal fat mass in the body, while 20% of liver cirrhosis female patients were above the normal ranges showing increased fat mass and interrelate with greater BMI[22]. Additional analysis was performed to find out relationship between nutritional status of patients and survival rate during hospital stay. Results represented that on the basis of percentiles of TSF or MAMC, 26% patients were overly nourished with >75th percentile, 34% patients were severely malnourished with <5th percentile and 20% patients were moderately malnourished with <10th percentile. Study concluded that patients were severe and moderate malnourishment during their disease duration had less survival rated as compared to the normal and overweight patients[23].

Hand grip strength was measured using hand grip dynamometer apparatus to assess muscle strength of hospitalized patients[9]. Results showed decreased muscle strength as compared to standard available in an additional study. Majority of females participated in the study were having decreased muscle strength compared to values 14 kg or less force. In males only 22.4% patients were having good muscle strength as values represented as 15 to 30 kg force while 53.4% patients were having decrease muscle strength compared to standard that is ≤24 kg were categorized as decrease muscle strength[24].

In liver cirrhosis patient's major complications included ascites and edema that directly affect the measurement of body mass index depicting nutritional status of patients as described earlier. As compared to it, subjective global assessment is a universal tool to assess nutritional status of cirrhotic patients. SGA evaluate the patients not only for weight change but also with dietary intake and functional capacity. Thus, combining both tools is necessary to critically assess the patients in order to improve their dietary intake, nutritional status and decrease complications.

In this study, comparison of nutrient intake at discharge and baseline showed that there was improvement in the protein servings in all patients that include different protein enriched sources like egg whites, lentils and chicken complement with vegetables. Furthermore, protein supplementation was a good source to increase the protein intake of patients till discharge from hospital. The daily calories intake of patients was also improved by suggesting multiple snacks, adequate food servings, food from all food groups and supplementation[25]. The use of oral dietary supplements can be a good option in liver cirrhosis patients; as suggested by a Japanese study that investigated the effect of regular snacks enriched with branched chain amino acids (BCAA) on cirrhosis patients for the duration of 3 months and it found there was an improvement in the serum albumin levels and other parameters of the patients who were consuming evening snacks with BCAA. Among patients consuming normal snacks and intervention group there was no significant change in the total energy intake of snacks[26].

CONCLUSION

In hospitalized liver cirrhosis patients, malnutrition is a predominant issue. Dietary consumption is one of the most considerable characteristics in the nutrition indices and outcome of hospitalized patients. Providing individualized nutritional intervention during the hospital stay helps to improve mean macronutrients intake (especially calories and protein) of patients that prevented from further malnourishment. Nutritional therapy and critical monitoring of liver cirrhosis patients for longer duration of time will help the patients to completely improve their nutritional status as well as decrease the chance of malnutrition and complications.

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Authors' contribution

Nida Javaid: compiled the literature review before start of the study, performed data collection in the hospital, entered data in software, statistical analysis and write up the initial draft of the paper. Khan Z: conceptualized and supervised the complete research as well as review and edit the document at each stage. Ali MA: helped with the validation of methodology and supervised the study. Tahir SK: helped with the statistical analysis and data curation and revision of manuscript.

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RESUMO – **Contexto** – A desnutrição é comum em pacientes com cirrose hepática e está correlacionada com complicações precoces, morbidade e mortalidade. **Objetivo** – O objetivo do estudo foi avaliar o estado nutricional, o impacto da triagem nutricional e a intervenção em pacientes com cirrose hepática, avaliando sua ingestão real de energia e proteína durante a internação hospitalar. **Métodos** – Foi realizado um estudo transversal em que o estado nutricional de todos os pacientes foi definido pela ferramenta de Avaliação Global Subjetiva. O fornecimento adequado de energia e proteína foi planejado e executado por meio de plano nutricional individualizado para pacientes com colaboração de nutricionista. As medidas antropométricas incluíram: altura, peso, índice de massa corporal, circunferência do braço médio, força de aderência da mão e espessura da dobra da pele tríceps. Os testes bioquímicos incluíram: hemoglobina, volume e concentração da hemoglobina corpuscular média, albumina e testes de função hepática. Para registrar a ingestão diária de alimentos, foi utilizado um recall dietético de 24 horas. **Resultados** – Ao todo foram incluídos 83 pacientes (média de 55 anos), entre eles 46% dos pacientes estavam moderadamente desnutridos, 12% estavam normais, enquanto 42% dos pacientes cirróticos estavam severamente depletados de acordo com a Avaliação Global Subjetiva. A ingestão média de calorias e proteínas foi melhorada durante a internação hospitalar após intervenção nutricional e monitoramento crítico (P<0,05). As medidas antropométricas na linha de base e descarga apresentaram diferenças significativas (P< 0,05) em peso, índice de massa corporal, espessura da dobra da pele do tríceps e valores médios de circunferência do braço, mas não na força de aderência da mão que estava associada à desnutrição entre os pacientes. **Conclusão** – Proporcionar intervenção nutricional individualizada e seu acompanhamento por nutricionistas qualificados durante a internação hospitalar ajuda a melhorar a ingestão em pacientes que previnem maior risco de desnutrição e complicações relacionadas.

Palavras-chave – Cirrose; ingestão alimentar; desnutrição; avaliação nutricional; intervenção nutricional.

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