

Evaluation of nutritional status in patients with liver cirrhosis

Fatma Houissa, Mohamed Salem, Radhouane Debbeche, Leila Mouelhi, Slim Bouzaidi, Majd Ben Rejeb, Haiffa Mekki, Amel Moussa, Yosra Said, Senda Trabelsi, Taoufik Najjar

Department of gastroenterology and hepatology – Charles Nicolle hospital – Tunis

F. Houissa, M. Salem, R. Debbeche, L. Mouelhi, S. Bouzaidi, M. Ben Rejeb, H. Mekki, A. Moussa, Y. Said, S. Trabelsi, T. Najjar

F. Houissa, M. Salem, R. Debbeche, L. Mouelhi, S. Bouzaidi, M. Ben Rejeb, H. Mekki, A. Moussa, Y. Said, S. Trabelsi, T. Najjar

Evaluation de l'état nutritionnel chez les patients cirrhotiques

Evaluation of nutritional status in patients with liver cirrhosis

LA TUNISIE MEDICALE - 2010 ; Vol 88 (n°02) : 63 - 66

LA TUNISIE MEDICALE - 2010 ; Vol 88 (n°02) : 63 - 66

RÉSUMÉ

Prérequis : La dénutrition est une complication fréquemment rapportée chez les patients cirrhotiques avec un impact clinique et économique considérable se traduisant par une augmentation de la morbidité et un prolongement de la durée d'hospitalisation.

But : Cette étude prospective préliminaire avait pour objectif de déterminer la prévalence de la malnutrition chez les patients cirrhotiques hospitalisés et d'évaluer la validité des paramètres biologiques et anthropométriques usuels dans l'identification de la malnutrition dans cette population de patients.

Méthodes : L'évaluation de l'état nutritionnel a été réalisée chez 44 patients (21 hommes, 23 femmes) en se basant sur des mesures anthropométriques et les données du bilan biologique. Le diagnostic de malnutrition a été retenu devant une diminution de la circonférence brachiale et/ou l'épaisseur du pli tricipital en dessous du 5ème percentile ou moins de 60%.

Resultats : L'étiologie de la cirrhose était virale chez 29 patients (66%), elle était classée Child Pugh A, B ou C chez respectivement 9, 26 et 9 patients. Une ascite modérée à tendue était retrouvée chez 37 patients (84%). Une malnutrition était retrouvée chez 35 patients (79,5%). Le pli tricipital et la circonférence brachiale étaient moins de 60% chez respectivement 72% et 25% des patients. Il n'y avait aucune différence statistiquement significative entre les patients dénutris et ceux ayant un bon état nutritionnel. Le pli tricipital et la circonférence brachiale diminuaient d'une manière significative en fonction du score de Child ($p=0,014$ et $0,032$ respectivement), une corrélation positive entre ces deux paramètres et la sévérité de la cirrhose a été retrouvée.

Conclusion : Dans cette étude, la prévalence élevée de la dénutrition est associée à la sévérité de la cirrhose. Les mesures anthropométriques constituent un moyen fiable pour le diagnostic de dénutrition chez les cirrhotiques.

SUMMARY

Background: Malnutrition is a frequently reported complication in patients with liver cirrhosis. It has a high clinical and economic impact reflected by an increased morbidity and prolonged hospital stay.

Aim : This preliminary prospective study aimed to determine the prevalence of malnutrition in hospitalized cirrhotic patients and to investigate whether biological and anthropometric parameters are a valuable tool for identifying malnutrition in these patients.

Methods: The nutritional status of 44 consecutive cirrhotic patients (21 men, 23 women) was assessed according to the anthropometric measurements and biochemical analysis. The diagnosis of malnutrition was based on diminished values of Mid arm muscle circumference (MAMC) and/or Triceps skinfold thickness (TST) below the 5th percentile or less than 60%.

Results: The aetiology of cirrhosis was viral hepatitis in 29 patients (66%). Cirrhosis was classified Child Pugh A, B or C in respectively 9, 26 and 9 patients; 37 patients (84%) have mild or tense ascite. In this study, malnutrition was found in 35 patients (79.5%), whereas 9 patients has a good nutritional status. TST and MAMC less than 60% was found in respectively 72% and 25% of patients. No significant statistical difference in epidemiological characteristics was found between malnourished and well-nourished patients. TST and MAMC decreased significantly according to the Child score ($p= 0.014$ and 0.032 respectively); a positive correlation was found between these two parameters and the severity of cirrhosis.

Conclusion: In this study, the high prevalence of denutrition was associated with the severity of cirrhosis. Anthropometric parameters are valuable tools for malnutrition diagnosis.

Mots-clés

Malnutrition – Paramètres anthropométriques - Cirrhose

Key - words

Malnutrition - Anthropometric parameters – Cirrhosis

Malnutrition is a common problem occurring in sick and hospitalized patients with a reported prevalence ranging from 20% to 60% [1-2-3]. It has a high clinical and economic impact reflected by an increased morbidity and prolonged hospital stay [4]. Detect of malnutrition requires anthropometric and biochemical tools but it is admitted that fluid retention and ascites in cirrhotic patients preclude interpretation of these parameters.

The primary aim of this study was to determine the prevalence of malnutrition in hospitalized cirrhotic patients. We investigate whether biological and anthropometric parameters are a valuable tool for identifying malnutrition in cirrhotic patients. Moreover, we attempted to assess the impact of different factors on nutritional status in cirrhotic patients.

PATIENTS AND METHODS

This is a prospective study including 44 consecutive cirrhotic patients admitted to the department of gastroenterology in Charles Nicolle hospital between January and December 2006. After this date, nutritional status was not assessed systematically in all patients so we stop inclusion at this time. The diagnosis of liver cirrhosis was made on the basis of usual clinical, biological and endoscopic signs of liver disease. The aetiology of cirrhosis was noticed for each patient and the severity of liver failure was assessed on admission by the child Pugh classification.

Nutritional assessment:

The nutritional status of the patients was assessed at the day of hospital admission according to the anthropometric measurements and biochemical analysis.

* Biochemical analysis including serum albumin and ferritin levels, haemoglobin rate, glucose, creatin, cholesterol and calcemia level.

* Anthropometric measurements:

Body weight was measured in light clothes with a non electronic scale and height was measured with specific measuring apparatus. Weight and height were used to calculate Body Mass Index (BMI) (weight [Kg]/ height [m]²). Patients were considered malnourished if the BMI was below 18.5 Kg/m² according to the recommendation of the WHO [5].

Triceps skinfold thickness (TST) was measured with Harpender calliper by the same operator. Measurement was taken midway between the tip of acromion and the olecranon process with the patient standing in a relaxed position.

Mid arm muscle circumference (MAMC) was calculated applying the formula by Gurney and Jelliffe from arm muscle circumference (MAC) and TST [6-2]. The diagnosis of malnutrition was based on diminished values of MAMC and/or TST below the 5th percentile or less than 60%.

Statistical analysis:

Statistical analysis was carried out using the software package SPSS. Results of quantitative variables are given as mean ± standard deviation (SD). Comparison of quantitative variables was performed using T- Student test. Comparison of qualitative

variables was performed using khi-deux test. An acceptable level of statistical significance was established at $p < 0.05$.

RESULTS

Description of the population:

Forty four patients were included in the study. The aetiology of cirrhosis was viral hepatitis in 29 patients (66%) and others causes including cryptogenetic cirrhosis in 10 cases, primary biliary cirrhosis in 2 cases, alcohol in 2 cases and Budd Chiari syndrome in one case.

Cirrhosis was classified Child Pugh A, B or C in respectively 9, 26 and 9 patients; 37 patients (84%) have mild or tense ascite. Complicated cirrhosis was noticed in 17 patients including spontaneous bacterial infection in 12 patients (27.2%), hepatocellular carcinoma in 5 patients (11.4%), bleeding in 3 patients (6.8%) and encephalopathy in 2 patients (4.5%).

Characteristics of patients:

The characteristics of the patients according their nutritional status are shown in table 1. A large proportion of patients (79.5%) suffered from malnutrition. TST and MAMC less than 60% was found in respectively 72% and 25% of patients.

Table 1 : Demographic, clinical and nutritional status of cirrhotic patients

Age (years)	57.6 ± 11.5
Sex M/F (%)	21/23
TST (mm)	9.1 ± 2.01
MAMC (cm)	22.5 ± 1.9
BMI (kg/m ²)	25.9 ± 3.2
Albumin (g/l)	30.8 ± 6.5

Comparison of malnourished and well-nourished patients:

In this study, malnutrition was found in 35 patients whereas 9 patients has a good nutritional status and no significant statistical difference in epidemiological characteristics was found between the two groups of patients (malnourished versus well-nourished). The comparison of biological parameters of the two groups was shown in table 2.

Table 2 : The comparison of biological parameters between patients with and without malnutrition

	Malnutrition		p
	With	Without	
Albumin (g/l)	30,4±4,5	32,4±3,2	0,26
Hemoglobin (g/dl)	8,5±3,7	11±4	0,008
Serum Iron level	3,7±1,4	12,8±2,8	0,037
Reactive C protein	16±5	16,4±3,7	0,96
VS	64,6±9,8	54,1±10,2	0,41
Glycémie	6,5±2,4	6±1,4	0,46
Creatin level	72±10,4	66±8,6	0,41
Cholesterol	2,7±1,2	2,9±1,1	0,48
Calcium	1,9±0,9	2,02±0,9	0,056

The distribution of BMI values, TST and MAMC according to the severity of cirrhosis was shown in table 3. TST and MAMC decreased significantly according to the Child score ($p= 0.014$ and 0.032 respectively); a positive correlation was found between these two parameters and the severity of cirrhosis (table 3). Severity of liver cirrhosis attested by the Child Pugh score paralleled impairment in nutritional status (figure 1).

Figure 1 : Severity of liver cirrhosis attested by the Child Pugh score paralleled impairment in nutritional status

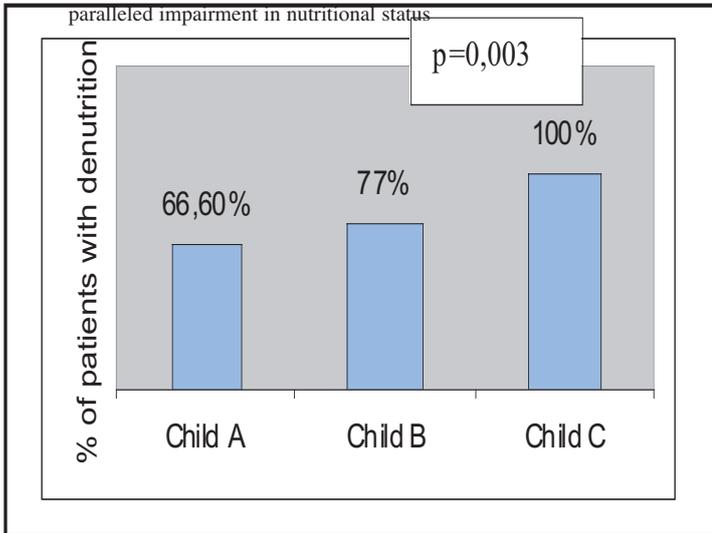


Table 3 : Anthropometric and biochemical tools according to the severity of liver cirrhosis.

	Child A	Child B	Child C	P
Albumin (g/l)	35,1	30,2	28,1	0,028
BMI (kg/m²)	26,9	25,9	25	0,682
TST (mm)	13	8	7	0,014
MAMC (cm)	22	18	18	0,032

DISCUSSION

In this study, malnutrition was found in 35 patients (79.5%), whereas 9 patients has a good nutritional status. TST and MAMC less than 60% was found in respectively 72% and 25% of patients. No significant statistical difference in epidemiological characteristics was found between malnourished and well-nourished patients. TST and MAMC decreased significantly according to the Child score ($p= 0.014$ and 0.032 respectively); a positive correlation was found between these two parameters and the severity of cirrhosis.

Malnutrition is a frequently reported complication in patients with liver cirrhosis [4]. The mechanism leading to malnutrition in those patients is not well understood [7-8]. Potential cause include a reduced nutrient supply due to anorexia, nausea, alteration of taste, inadequate nutrient intake and/or the need of unpalatable salt- or protein restricted diet [8]. The second major mechanism of denutrition in cirrhotic patient was the disturbance in nutrient metabolism and the increase of energy metabolism [8].

Finally, impaired digestion and/or absorption of nutrients due to abnormalities in pancreatic or biliary secretion may occur and contribute to malnutrition during cirrhosis [8-9]. Few study have assessed denutrition in cirrhotic patients in our country and this study was carried out prospectively to evaluate whether biological and anthropometric parameters are a valuable tool for identifying malnutrition in cirrhotic patients. This problem is particularly crucial in cirrhotic because malnutrition has a high prevalence and represents a negative prognostic factor on survival. Detection of malnutrition requires simple and inexpensive tools such as body weight, BMI and changes in weight, albumin level; however it is admitted that fluid retention and ascites and albumin deficiency preclude interpretation of these parameters in such patients [5].

In this study, prevalence of denutrition was 79.5%. In our view and in the view of other [10-11], this rate can be explained by the high frequencies of decompensated and complicated cirrhosis in our study group. In fact, hospital malnutrition has been related to increased morbidity, mortality and length of hospital stay [11]. It is well established that alcoholism is associated with malnutrition in cirrhotic patient [12] but in our study the high prevalence of malnutrition was more likely associated with the severity of cirrhosis and the poor socio-economic condition than with the aetiology of cirrhosis.

CONCLUSION

Malnutrition might be one of the most important factors that interfere in health and most of common disease in gastroenterology unit [13-11]. Therefore, nutritional assessment should be routinely performed at admission either in cirrhotic patient to reduce nutrition-related complications. Biological and anthropometric parameters are a valuable tool for identifying malnutrition in these patients.

RÉFÉRENCES

- 1- Martineau J, D; Bauer J, Isenring E, Cohen S. Malnutrition determined by the patient-generated subjective global assessment is associated with poor outcomes in acute stroke patients. *Clin Nutr* 2005;24:1073-7.
- 2- Normana K, Schütza T, Kemps M, Lübke HJ, Lochs H, Pirlich M. The Subjective Global Assessment reliably identifies malnutrition-related muscle dysfunction. *Clin Nutr* 2005;24:143-50.
- 3- O'Flynn J, Peake H, Hickson M, Foster D, Frost G. The prevalence of malnutrition in hospitals can be reduced: Results from three consecutive cross-sectional studies. *Clinical Nutrition* 2005;24:1078-88.
- 4- Pirlich M, Schütz T, Norman K, Gastell S, Lübke HJ, Bischoff S, et al. The German hospital malnutrition study. *Clinical Nutrition* 2006;25:563-72.
- 5- Campillo B, Richardet JP, Bories PN. Validation de l'indice de masse corporelle pour le dépistage de la dénutrition chez le malade cirrhotique *Gastroenterol Clin Biol* 2006;30:1137-1143
- 6- Hasselmann M, Alix E. Outils et procédures de dépistage de la dénutrition et de son risque en milieu hospitalier. *Nutr clin métabol* 2003 ;17 :218-26.
- 7- Sien-Sing Y, Chi-Hwa W, Li-Lin C, San-Chu M, Der-Fang C. Nutritional status in non-alcoholic sub-clinical porto-systemic encephalopathy. *WJG* 1998;4:380-4.
- 8- Riggio O, Angeloni S, Ciuffa L, Nicolini G, Attili Af, Albanese C, Merli M. Malnutrition is not related to alterations in energy balance in patients with stable liver cirrhosis. *Clinical Nutrition* 2003 ;22:553-9.
- 9- Elia M, Zellipour L, Stratton RJ. To screen or not to screen for adult malnutrition?. *Clinical Nutrition* 2005;24:867-84.
- 10- Regina Caly W, Strauss E, Carrilho FJ, Laudanna A. Different degrees of malnutrition and immunological alterations according to the aetiology of cirrhosis: a prospective and sequential study. *Nutrition Journal* 2003 ; 2:1-9.
- 11- Isabel M, Correia D, Waitzberg DL. The impact of malnutrition on morbidity, mortality, length of hospital stay and cost evaluated through a multivariate model analysis. *Clin Nutr* 2003;22:235-9.
- 12- Lieber CS. Alcohol and the liver: 1994 update. *Gastroenterology* 1994;106:1085-105.
- 13- Norman K, Kirchner H, Lochs H, Pirlich M. Malnutrition affects quality of life in gastroenterology patients. *World J Gastroenterol* 2006;12:3380-5.