

PRE-OPERATIVE NUTRITIONAL EVALUATION IN LIVER TRANSPLANT CANDIDATES

Avaliação Nutricional Pré-operatória de Candidatos a Transplante Hepático¹

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ABSTRACT

Objective: The high prevalence of malnutrition in patients with end-stage of liver disease requires broad intensive measures to evaluate the pre-operative nutritional status while on the waiting list, aiming early disturbance corrections and a better after-transplant prognosis. **Methods:** An assessment on 33 out of 44 prognosis on liver transplantation waiting list was performed from March, 2004 to January, 2005. The current body weight, dry body weight, ideal body weight, body mass index, the percentage of adequacy of dry body weight / ideal body weight, tricipital skin fold, mid-arm muscular circumference, uncorrected mid-arm muscular area, blood albumin levels, and total lymphocyte count were assessed. **Results:** Upon the use of the body mass index and percentage of adequacy of the dry body weight / body mass index assessments, higher frequency of eutrophic and obese patients were observed, respectively. The protein depletion was higher than fat depletion in those patients, probably related to the catabolism associated to the liver disease and physical inactivity. **Conclusion:** Many nutritional measures are necessary in order to improve the accuracy of the results.

Keywords: Nutritional Assessment, Liver Transplantation, Malnutrition, Total Lymphocyte Count.

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INTRODUCTION

Liver is the largest metabolic organ in the human body which integrates a wide range of complex biochemical processes: carbohydrate, fat and protein metabolism, vitamin storage and activation, detoxification and excretion of endogenous and exogenous products.^{1,2} Upon a liver failure, the development of protein energy malnutrition (PEM) can be observed.

The presence of PEM has been associated to adverse outcomes, such as lower graft and patient survival after liver transplant,³ high morbidity and mortality before¹ and after liver transplant (LT),² longer stay in the hospital and in the intensive care unit, more extensive procedures,⁴ as well as a decrease in the quality of life with deleterious effects on the immunological function.⁴

A careful nutritional assessment in LT candidates is mandatory, but no gold standard measures exist in order to assess the grade of malnutrition among such population. The aim of this study was to assess the nutritional status of candidates on the LT in a teaching hospital.

METHODS

Thirty-three out of 44 patients on the waiting list in the Liver Transplantation Division of the Botucatu School of Medicine - UNESP were assessed from March, 2004 to January, 2005.

Such nutritional assessment was analyzed using anthropometric and biochemical parameters: current body weight (CBW), height, adequacy of tricipital skin fold (%TSF), arm circumference (% AC), the blood albumin levels, and total lymphocyte counting

(TLC). The dry body weight (DBW),⁵ body mass index (BMI), ideal body weight (IBW),⁶ the percentage on adequacy of the dry body weight / ideal body weight (%DBW/IBW), the adequacy of mid-arm muscular circumference (%MMC) and uncorrected mid-arm muscular area (%MMA) were calculated.

RESULTS

The population was predominantly male (87,9%) with mean age of $51 \pm 9,1$ years, inactive (66,6%) and Child – Turcotte – Pugh (CTP) B, or C (84,8%). The alcoholic cirrhosis was a present etiology in 42,4% patients, and associated to other etiologies in 63,7%.

The patients were considered eutrophic and obeses whenever the IBM were 18,5 - 24,9 Kg/m² and ≥ 30 Kg/ m², respectively. Other parameters were assessed by the percentage of adequacy, and patients with <90% percentage of adequacy and >90% eutrophic were considered undernourished. By using the adequacy of the tricipital skinfold, patients were classified obeses with a percentage of adequacy $\geq 120\%$. By counting the albumin and total lymphocyte parameters, patients were classified depleted whenever the values attained < 3,5 mg/dl and < 2000/mm³, respectively.

By using the BMI and %DBW/IBW assessment, the higher frequency of eutrophic (42,4%) and obese (48,5%) patients were observed, respectively. The protein depletion assessed by the %MMC (60,6%) and %MMA (66,7%) was higher than the fat depletion assessed by the %TSF(45,5%) in those patients. Thirty patients (90,9%) exhibited albumin depletion, and 28 patients (84,8%) showed lower TLC value. (Table 1)

DISCUSSION

Although the dry body weight has been calculated, the measurement dependants of the weight may mask the nutritional status because of the fluid retention.⁴ The fact the protein depletion was higher than the fat depletion is probably related to the catabolism present in liver diseases⁷ and to the physical inactivity.¹

Several clinical situations may influence the albumin and immunological depletion such as the liver disease stage, hydroelectrolitic unbalance, renal failure, intestinal malabsorption, and immunosuppression.^{4,8} Therefore, visceral protein and TLC depletion have been correlated to the severity of the liver disease rather than to the malnutrition degree.

The analysis of nutritional studies in cirrhotic patients has been associated to some difficulties in a clinical perspective, to a disparity in the real prevalence of malnutrition in several studies that depends on the used parameters.⁹

Overall, by using standard anthropometry, the malnutrition has been reported in 33% to 43% of the liver transplant candidates.^{10,11} However, when using immunological function or visceral proteins to assess the nutritional status, the prevalence seems to be as high as 90% and 100%, respectively.¹¹

CONCLUSION

It was concluded that the PEM prevalence depends on the nutritional parameters and the studied population. A broader amount of measures should be used in order to allow more accurate studies.

Table 1: Nutritional status of subjects

Anthropometric category	Parameters	Results
BMI (Kg/m2)	Malnutrition	$\leq 18,4$ Kg/m ² 5(15,1%)
	Normal Weight	18,5-24,9 Kg/m ² 14 (42,4%)
	Overweight:	25-29,9 Kg/m ² 10 (30,3%)
	Obese class I	20-34,9 Kg/m ² 1 (3%)
	Obese class II	35-39,9 Kg/m ² 2 (6,1%)
	Obese class III	≥ 40 Kg/m ² 1 (3%)
%DBW/IBW	Severe malnutrition	$\leq 70\%$ 0
	Moderated malnutrition	70,1-80% 1 (3%)
	Light malnutrition	80,1-90% 2 (6,1%)
	Normal Weight	90,1-110% 12 (36,4%)
	Overweight:	110,1-120 2 (6,1%)
	Obesity	>120% 16 (48,5%)
%TSF	Severe malnutrition	$\leq 70\%$ 9 (27,3%)
	Moderated malnutrition	70,1-80% 3 (9,1%)
	Light malnutrition	80,1-90% 3 (9,1%)
	Normal Weight	90,1-110% 3 (9,1%)
	Overweight	110,1-120 14 (42,4%)
	Obesity	> 120% 1 (3%)
%MMA	Severe malnutrition	$\leq 70\%$ 16 (48,5%)
	Moderated malnutrition	70,1-80% 1 (3%)
	Light malnutrition	80,1-90% 5 (15,2%)
	Normal	> 90% 11 (33,3%)
%MMC	Severe malnutrition	$\leq 70\%$ 2 (6,1%)
	Moderated malnutrition	70,1-80% 8 (24,2%)
	Light malnutrition	80,1-90% 10 (30,3%)
	Normal	> 90% 13 (39,4%)
Laboratorial category		
Depletion of albumin	Normal	> 3,5 g/dl 3 (9,1%)
	Light depletion	3-3,5 g/dl 14 (42,4%)
	Moderate depletion	2,4-2,9 g/dl 11 (33,3%)
	Severe depletion	<2,4 g/dl 2 (6,1%)
	Without Information	3 (9,1%)
TLC	Normal	> 2000/mm ³ 13 (39,4%)
	Light depletion	1200-2000/mm ³ 10 (30,3%)
	Moderate depletion	800-1199/mm ³ 7 (21,2)
	Severe depletion	< 800/mm ³ 2 (6,1%)
	Without Information	1 (3%)

BMI = body mass index, %DBW/IBW = percentage on adequacy of dry body weight / ideal body weight, %TSF = adequacy of tricipital skin fold, %MMC = adequacy of mid-arm muscular circumference (%MMC), %MMA = uncorrected mid-arm muscular area, TLC = total lymphocyte count.

RESUMO

Introdução: A desnutrição é altamente prevalente em pacientes candidatos a transplante hepático. Sendo parâmetro preditivo de morbimortalidade, a adequada avaliação do estado nutricional nestes pacientes é útil no diagnóstico de importantes desvios e enseja a aplicação de medidas de correção capazes de melhorar o prognóstico. **Objetivo:** Avaliar o estado nutricional dos pacientes candidatos a transplante hepático em um Hospital Universitário. **Métodos:** Dos 44 pacientes listados, avaliaram-se 33, entre março de 2004 e janeiro de 2005. Os dados foram coletados através de análise retrospectiva de protocolos nutricionais e prontuários. Mensurou-se o peso atual, peso seco e peso ideal, índice de massa corpórea, percentagem adequação peso seco/peso ideal, prega cutânea tricípital, circunferência muscular do braço e área muscular do braço corrigida, depleção de albumina e contagem total de linfócitos. **Resultados:** Com a utilização do índice de massa corpórea e da percentagem peso seco/peso ideal, maiores freqüências de eutrofia e obesidade foram encontradas, respectivamente. A depleção protéica foi superior ao grau de depleção de tecido adiposo, principalmente pelo catabolismo próprio da doença e pela inatividade física. **Conclusão:** A prevalência de desnutrição varia conforme o tipo de avaliação nutricional utilizada e população estudada, sendo prudente utilizar o maior número possível de parâmetros, a fim de aumentar a confiabilidade dos resultados.

Descritores: Avaliação Nutricional, Transplante Hepático, Desnutrição, Contagem de Linfócitos.

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