Evolution of nutritional status in lung transplant candidates who are initially malnourished or overweight*

Evolução do estado nutricional de pacientes desnutridos ou com excesso de peso candidatos a transplante pulmonar

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Abstract

A retrospective study using anthropometric data to assess the evolution of nutritional status in lung transplant candidates who are initially malnourished or overweight. We included patients with an initial body mass index (BMI) < 17 kg/m^2 (malnourished, n = 10) or > 27 kg/m^2 (overweight, n = 20). Each patient subsequently had three appointments with a nutritionist (nutritional interventions). In the malnourished group, there were no significant post-intervention changes in the anthropometric variables. In the overweight group, however, nutritional intervention had a positive impact on weight, BMI and waist circumference.

Keywords: Lung transplantation; Nutritional status; Body mass index; Anthropometry.

Resumo

Estudo retrospectivo, que avaliou a evolução do estado nutricional, por meio de antropometria, de candidatos a transplante pulmonar desnutridos ou com excesso de peso. Foram incluídos pacientes com índice de massa corpórea (IMC) < 17 kg/m^2 (desnutrido, n = 10) ou IMC > 27 kg/m^2 (sobrepeso, n = 20) no momento da avaliação inicial. Estes pacientes foram submetidos por três consultas com um nutricionista (intervenções nutricionais). Não houve diferenças significantes nas variáveis antropométricas após as intervenções no grupo desnutrido. Porém, os resultados do grupo sobrepeso mostraram o impacto positivo da intervenção nutricional no peso, IMC e circunferência da cintura dos pacientes.

Descritores: Transplante de pulmão; Estado nutricional; Índice de massa corporal; Antropometria.

Lung transplantation can be indicated for the treatment of pulmonary diseases, and that indication is based on a number of factors, including patient history, physical condition, laboratory findings and age.[1] The treatment of such patients, including the anthropometric evaluation, must be initiated in the preoperative period, in order to help identify the degree of impairment of the nutritional status and, if necessary, conduct an immediate nutritional intervention,[2] since it is known that pulmonary disease frequently affects nutrient intake, putting the patients at risk of malnutrition or overweight.[3]

In one retrospective study conducted in Toronto,[4] the relationship between the preoperative nutritional status and post-lung transplant mortality was analyzed. The authors concluded that patients with a body mass index (BMI) lower than 17 kg/m^2 or greater than 27 kg/m^2, prior to transplantation, presented a significantly greater risk of death after the transplantation. On the basis of that evidence, the authors suggested that only patients whose BMI is within the 17-27 kg/m^2 range be considered candidates for transplantation.

In a previous study of lung transplant candidates at our institution,[5] the prevalence of malnutrition was found to be highest among those with cystic fibrosis and those with bronchiectasis, whereas the prevalence of obesity was highest among those with pulmonary fibrosis. In view of those facts, we felt that there was a need to conduct a study that would determine the weight alterations of lung transplant candi-

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dates who are not within the BMI range that is considered ideal.

The study was retrospective and evaluated the data of malnourished or overweight lung transplant candidates, regardless of gender, age bracket or type of previous pulmonary disease.

We included outpatients treated between August of 2003 and August of 2008, who presented BMI < 17 kg/m^2 or BMI > 27 kg/m^2 at the time of the initial evaluation (malnourished group and overweight group, respectively). The patients had three individual appointments with a nutritionist. The interval between the first and the third appointment was, at most, 180 days.

The variables used were obtained from the medical charts of the patients and included the following: name, gender, age, underlying lung disease, number of days of follow-up, weight (kg) and height (m).

Based on the weight and height data, we calculated the BMI[6] of each patient, using the reference standards recommended for the age bracket for the classification.[7-9]

The categorical variables were presented in tables comprising absolute (n) and relative (%) frequencies. The association between nutritional status and each of those variables was evaluated using the chi-square test.[10]

The quantitative variables with normal distribution were presented as mean and standard deviation and evaluated using paired Student's t-test for each group; the variables without normal distribution were evaluated using the nonparametric Mann-Whitney test.[10]

The variables were calculated using the Statistical Package for the Social Sciences, version 15.0 (SPSS Inc., Chicago, IL, USA), and values of $p < 0.05$ were considered significant.

The project was approved by the scientific committee and research ethics committee of the institution.

The sample comprised 30 patients; 10 in the malnourished group and 20 in the overweight group.

Table 1 shows the characteristics of the studied groups.

Table 1 - Characteristics of the studied groups.[a]

Characteristic	BMI < 17 kg/m^2	BMI > 27 kg/m^2	p
	n = 10	n = 20	
Follow-up period (days)[b]	120 (62-161)	79 (57-147)	0.035
Age, years[c]	34 ± 16	48 ± 12	0.010
Gender			
Male	5 (50)	13 (65)	0.429
Female	5 (50)	7 (35)	
Underlying disease			
Bronchiectasis	3 (30)	1 (5)	0.004
Pulmonary emphysema	1 (10)	8 (40)	
Pulmonary fibrosis	1 (10)	8 (40)	
Cystic fibrosis	4 (40)	0 (0)	
Other	1 (10)	3 (15)	

BMI: body mass index. [a]Data expressed as n (%), except where otherwise noted. [b]Data expressed as median (variation). [c]Data expressed as mean ± SD.

A significant difference was found in the relationship between the underlying disease and the nutritional status, showing that bronchiectasis and cystic fibrosis are more closely related to malnutrition, and those with pulmonary fibrosis and pulmonary emphysema presented excess weight. The fact that patients with cystic fibrosis are malnourished is known.[3,11] However, data from the literature also indicate the malnutrition of patients with pulmonary emphysema,[12] which is not consistent with our results.

The relationship between pulmonary fibrosis and the excess weight has been established,[3] and our findings are in agreement with that.

The follow-up period of the lung transplant candidates in the study was greater in the malnourished group than in the overweight group. Nevertheless, the first group did not present statistically significant recovery of nutritional status, which indicates that time was not a determinant.

The oscillation of the variables weight and BMI in the malnourished group was not statistically significant, as described in Table 2.

Table 2 - Initial and final evaluation of the anthropometric data of the studied groups.[a]

Variable	BMI < 17 kg/m^2		p	BMI > 27 kg/m^2		p
	n = 10			n = 20		
	Initial evaluation	Final evaluation		Initial evaluation	Final evaluation	
Weight, kg	42.1 ± 5.5	43.1 ± 5.7	0.171	83.6 ± 14.5	79.0 ± 14.5	< 0.001
BMI, kg/m^2	16.2 ± 0.8	16.6 ± 1.1	0.158	31.5 ± 3.4	29.7 ± 3.4	< 0.001

BMI: body mass index. [a]Data expressed as mean ± SD.

However, the results show that the nutritional intervention program had a positive impact on the nutritional status in the overweight group.

The practical guide of treatment of excess weight developed by the National Heart, Lung and Blood Institute[13] reports that a 10% reduction in body weight, over a period of 180 days or less, decreases the risk for the development of disease. In the present study, there was a reduction of 4.6 kg (5.5%) over a period of 79 days in the overweight group, according to the median number of follow-up days.

The results found can be compared with those reported by another study,[14] in which COPD patients were monitored for 1 year, and divided into three groups: malnourished, normal and overweight. A reduction of 1.7 kg was observed in the overweight group after three months of nutritional intervention. It is worthy of note that, in the present study, the reduction in weight observed in the same period of time was greater than was that reported in the aforementioned study.

Analyzing the results obtained in this study, we conclude that the evolution of the nutritional status of lung transplant candidates was considered satisfactory only for the overweight patients, who were counseled to reduce their weight to the set goal.

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