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Comunicación breve

Oral nutritional supplements intake and nutritional status among inpatients admitted in a tertiary hospital

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Abstract

Introduction: **Malnutrition is very common in hospitals and inpatients with prescription of oral nutritional supplementation have improvement of the nutritional status.**

Objectives: **To detect the total acceptance rate and a possible association between oral nutritional supplements intake and nutritional status.**

Methods: **A cross-sectional study was carried out among 398 inpatients. Fifteen types of supplements were analyzed and nutritional status was detected by Subjective Global Assessment (SGA). Rest-ingestion index (RI) was obtained and Modified Poisson's regression was used to detect associations between nutritional status and intake of nutritional supplements.**

Results: **The prevalence of malnutrition was 43.7% and overall acceptance of supplements was around 75%. Industrialized supplements have better acceptance among well-nourished inpatients and patients who ate less than 80% of the supplement offered (industrialized or homemade) had higher risk for malnutrition (48%).**

Conclusion: **There was an association between oral nutritional supplements intake and nutritional status, despite the good acceptance rate.**

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Key words: *Dietary Supplements. Nutritional Status. Malnutrition. Patient Acceptance of Health Care.*

LA INGESTA ORAL DE SUPLEMENTOS NUTRICIONALES Y EL ESTADO NUTRICIONAL DE LOS PACIENTES INGRESADOS EN UN HOSPITAL TERCIARIO

Resumen

Introducción: **La malnutrición es muy frecuente en los hospitales y, en los pacientes ingresados con una prescripción de suplementación nutricional oral, hay una mejoría del estado nutricional.**

Objetivos: **Detectar la tasa total de aceptación y la posible asociación entre la toma de suplementos de nutrición oral con el estado nutricional.**

Métodos: **Se realizó un estudio transversal entre 398 pacientes ingresados. Se analizaron 15 tipos de suplementos y se detectó el estado nutricional mediante la escala Subjective Global Assessment (SGA). Se obtuvo el índice reposo-ingesta (IR) y se empleó la regresión modificada de Poisson para detectar las asociaciones entre el estado nutricional y la toma de suplementos nutritivos.**

Resultados: **La prevalencia de malnutrición fue del 43, 7% y la aceptación global de los suplementos fue de alrededor del 75%. Los suplementos de origen industrial tienen una mejor aceptación entre los pacientes bien nutridos y los pacientes que ingieren menos del 80% del suplemento ofrecido (ya sea industrial o casero) presentan un mayor riesgo de malnutrición (48%).**

Conclusión: **Hubo una asociación entre la ingesta de suplementos nutricionales orales y el estado nutricional, a pesar de una buena tasa de aceptación.**

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Palabras clave: *Suplementos dietéticos. Estado nutricional. Malnutrición. Aceptación del paciente de la atención sanitaria.*

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Abbreviations

RDA: Recommended Daily Allowance.
SGA: Subjective Global Assessment.
RI: Rest-ingestion index.
SPSS: Statistical Package for the Social Science.
CI: Confidence interval.
ONS: Oral nutritional supplements.
SD: Standard deviation.

Introduction

Malnutrition is very common among inpatients and prevalences are over 80% in certain countries.[1] Nutritional deficiences, especially low intake of proteins, leads to increased morbidity and mortality. After hospitalization, about 70% of malnourished patients have a gradual worsening of their nutritional status.[2]

Oral nutritional supplements (ONS) have been used to complement the daily diet and to compensate a possible deficiency of nutrients in order to achieve the values suggested by the Recommended Daily Allowance (RDA). Studies have been shown that inpatients with prescription of oral supplementation have improvement of their nutritional status[3] and higher quality of life,[4] when compared with subjects without supplementation. However, successful compliance with prescription of oral nutritional supplements depends largely on their acceptance by inpatients.

Homemade nutritional supplements made with milk, juice fruits and modules (proteins, carbohidrates) are considered alternatives to store-bought supplements,[5] which are more expensive and, in some cases, less palatable when compared with homemade supplements. Few studies compared the acceptance of industrialized versus homemade nutritional supplements according to nutritional status. The aims of this study are to detect the total acceptance rate of oral nutritional supplements, to describe the main reasons for no acceptance and to detect a possible association between oral nutritional supplements intake and nutritional status among inpatients admitted in a tertiary hospital.

Materials and methods

A cross-sectional study was carried out among inpatients admitted in a tertiary hospital in Porto Alegre, Rio Grande do Sul, Brazil (Hospital Nossa Senhora da Conceição). The study was approved by the institutional Research Ethics Committee (protocol number 0114/10) and all participants signed an Informed Consent Form.

Data were collected from May to November 2011. Men and women older than 18 years who received industrialized oral supplements or homemade oral supplements prescribed by nutritionists were evaluated. For exclusion criteria were considered dementia, alternative feeding requirement (tube feeding), patients who were admitted in recovery or emergency rooms and those who were admitted in the hospital for less than three days.

Fifteen types of supplements were analyzed: four industrialized (from different pharmaceutical companies) and eleven preparations (based on milk or fruits juice) with modules of fiber, protein or carbohidrates were homemade.

Nutritional status was detected Subjective Global Assessment (SGA),[6,7] applied by previously trained researchers. Inpatients with SGA final score B or C were classified as malnourished. Participants also answered a standardized questionnaire with sociodemographic questions and clinical informations were obtained by eletronic medical records.

Rest-ingestion index (RI) was used to detect the total acceptance rate and it was obtained from the difference between the amount of supplement offered (standardized by the Division of Nutrition) and the amount of supplement not ingested by the subject. We used Filizolaâ digital scale with sensitivity of 5 g, minimum capacity of 10 g and maximum capacity of 3 kg for measuring the waste of preparations not ingested. The reasons for the rejection of the preparation were asked, if applicable.

Statistical analyzes were performed with the software SPSS (Statistical Package for the Social Science, version 16.0, IL, USA). Data were expressed as mean and standard deviation, median and interquartile range or frequencies (%). For comparisons between patients according to nutritional status (well nourished vs. malnourished) Student's t test or Wilcoxon Mann-Whitney's test and Pearson's chi-square test were used. Modified Poisson's regression (expressed as risk ratio and 95% CI) was used to detect associations between nutritional status and intake of less than 80% of the oral supplement offered, after the control for confounding factors.

Results

In total, 398 patients (215 men and 183 women) were assessed and the mean age was 58.1 ±15.7 years old. The prevalence of malnutrition according to SGA at the time of hospitalization was 43.7% (40.7% suspected or moderately malnourished and 3% severely malnourished). The most important causes of hospitalization were cancer (30.7% among all cases), followed by cardiovascular diseases (20.4%), nephropathies and urological diseases (15.8%) and gastrointestinal problems (14.3%). Table I shows the main sample characteristics according to nutritional status detected by SGA.

All homemade supplements were grouped according to similar organoleptic characteristics: 45.2% of them were made from milk and 30.4% were made from fruit juice. In total, 24.4% of the supplements offered

Table I
Characteristics of the sample according to nutritional status detected by SGA

	Total sample n = 398	*Well-nourished n = 224*	*Malnourished n = 174*	*P-value*
Age, in years*	58.1 ± 15.7	56.4 ± 15.7	60.1 ± 15.4	0.02§
Gender, in %				0.2†
Male	54	59.5	40.5	
Female	46	52.5	47.5	
Scholarity, in %				0.8†
Illiterate/elementary school	81.7	56	44	
High School/college	18.3	57.5	42.5	
Length of hospital stay, in days¶	13 (3-157)	12 (3-59)	14.5 (3-157)	0.001‡
Days receiving ONS¶	4 (1-90)	4 (2-47)	5 (1-90)	0.1‡
Total acceptance rate*	85.9 ± 28.8	89.3 ± 26.9	81.5 ± 30.5	0.007§

*Data expressed as mean ± standard deviation (SD).
¶Data expressed as median (interquartile amplitude).
§Student's t test.
†Wilcoxon Mann-Whitney's test.
‡Pearson's chi-square test.

were industrialized. Overall acceptance of all types of supplements was around 75%.

Among well-nourished inpatients, homemade juice fruit supplements have a lower acceptance when compared with industrialized supplements (p = 0.04), but among malnourished inpatients there was no difference regarding all types of supplements (p = 0.3). Industrialized supplements have better acceptance among well-nourished inpatients when compared with malnourished subjects (97 *vs.* 89%, P = 0.01).

Lack of appetite and unpleasant appearance of the supplement were the most cited reasons among inpatients to justify the lower intake. Comparing with well-nourished subjects, malnourished inpatients had higher frequencies of complains about the appearance of the supplement (85.7 *vs.* 14.3%, P = 0.02) and the lack of appetite (85.4 *vs.* 14.6%, P < 0.001).

Table II shows the multivariate analysis for the association between different variables and malnutrition detected by SGA. Inpatients who ate less then 80% of the nutritional supplement offered (industrialized or homemade) had higher risk for malnutrition when compared with patients who ate more than 80% of the meal, after control for confounding factors as gender, age and hospital length stay (RR 1.48 95% CI 1,06-2,07, P = 0.02).

Table II
Multivariate analysis for the association between different variables and malnutrition detected by SGA*

Variable	*RR*	*CI 95%*	*P-value*
Gender			
Male	1		0.3
Female	1.17	0.86-1.58	
Age			
< 60 years	1		0.3
≥ 60 years	1.17	0.86-1.57	
Length of hospital stay			
< 13 days	1		0.05
≥ 13 days	1.36	1.00-1.84	
Acceptance rate			
≥ 80%	1		0.02
< 80%	1.48	1.06-2.07	

*Modified Poisson Regression.

Discussion

To our knowledge, this is the first study comparing the acceptance of industrialized versus homemade nutritional supplements among well-nourished and malnourished inpatients. Besides, our data suggest an association between lower acceptance of oral nutritional supplements and malnutrition detected by SGA. Several studies have shown that the use of nutritional supplements among adults and elderly patients may be beneficial in many clinical situations,[8,9] and we showed a good rate of acceptance as other authors.[10] However, we found a risk to malnutrition with an acceptance rate lower than 80%, and this value is higher than our overall acceptance rate, which was 75%.

Beyond to detect the acceptance rate of oral nutritional supplements offered in hospitals, is important to verify the reasons for no acceptance. Our study showed that the lack of appetite and the unpleasant appearance of the supplement were the most commented reasons that interfered in the acceptance of the supplements, industrialized and homemade. Lack of appetite related to illness is common among inpatients and other authors also showed a lower consumption of oral supplements among individuals who related lack of appetite due to the hospital enviroment, which can

interfere over eating habits and influence the decrease of food intake.[11] The use of culinary techniques is essential to improve the appearance of the supplements offered at the hospital and to stimulate the intake of these foods in order to have lower waste and to increase the acceptance by inpatients.

Our data showed no difference in the acceptance rate between industrialized or homemade supplements in malnourished inpatients and among well-nourished inpatients the industrialized supplements had better acceptance. Other authors showed that homemade supplements were well accepted among adults[12,13] and children,[14] being a simple and inexpensive alternative to industrialized oral supplements to nutritional recovery, despite the lower amounts of certain micronutrients when compared with store-bought oral supplements. The prescription of oral supplements is considered a simple intervention which can improve the nutritional status and prevent a possible malnutrition, but the use of this nutritional support is still considered low.[15]

The cross-sectional design is a limitation of the present work, because it does not detect the real risk for malnutrition.

In conclusion, we showed a good rate of acceptance and an association between oral nutritional supplements intake and nutritional status among inpatients. It is suggested that further studies should be conducted, with a longitudinal design to evaluate these associations prospectively. Our data reinforce the importance of controlling the oral supplementation intake among inpatients to improve acceptances rates and to decrease malnutrition.

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