Nutritional Profile of Cardiovascular Disease Bearing Patients Under Hospitalization: A Prospective Study

Perfil Nutricional de Portadores de Doenças Cardiovasculares Internados em um Hospital: Estudo Prospectivo

Perfil nutricional de los pacientes con enfermedad cardiovascular en un hospital: estudio prospectivo

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ABSTRACT

Objective: The study's main goal has been to evaluate the nutritional status of patients bearing cardiovascular diseases admitted to a hospital. **Methods**: It is an analytical, prospective, and cohort study with quantitative approach that was carried out in a hospital, where the sampling consisted of 54 patients from a cardiology sector. A semi-structured form, an anthropometric scale and a measure ment tape were used in order to obtain the data. **Results**: Regarding the body mass index, the eutrophic and pre-obesity stages prevailed (40.7%). There is no cardiometabolic risk. Concerning the patients living habits, 33.3% have or have had smoking habits, 53.7% have drinking habits and 83.3% do not practice physical activity. Hypertension was found in 51.8% of the population. The prevalent diagnosis was heart failure (29.7%). Laboratory tests did not show any significant changes. **Conclusion:** The nutritional profile of patients bearing cardiovascular diseases is not characterized by anthropometric and laboratory alterations, but by both the patients' clinical history and their life habits.

Descriptors: Cardiovascular diseases, Nutritional assessment, Risk factors.

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RESUMO

Objetivo: Avaliar o estado nutricional de pacientes portadores de doenças cardiovasculares internados em um hospital. **Método:** Trata-se de um estudo analítico, prospectivo, transversal, com abordagem quantitativa, realizado em uma instituição hospitalar na qual a amostra foi composta por 54 pacientes de uma cardiologia. Foi utilizado um formulário semiestruturado, uma balança antropométrica e uma fita métrica. **Resultados:** Em relação ao índice de massa corpórea, prevaleceu a eutrofia e a pré-obesidade (40,7%). Observa-se ausência de risco cardiometabólico. Quanto aos hábitos de vida, 33,3% têm ou já tiveram hábitos tabagistas, 53,7% têm hábitos etilistas e 83,3% não praticam atividade física. A hipertensão arterial foi encontrada em 51,8% da população. O diagnóstico prevalente foi a insuficiência cardíaca (29,7%). Os exames laboratoriais não tiveram alterações significativas. **Conclusão:** O perfil nutricional de pacientes com doenças cardiovasculares não se caracteriza por alterações antropométricas e laboratoriais, mas sim pelo histórico clínico e hábitos de vida dos pacientes.

Descritores: Doenças cardiovasculares, Avaliação nutricional, Fatores de ris.

RESUMEN

Objetivo: Evaluar el estado nutricional de los pacientes con la enfermedad cardiovascular en un hospital. **Método:** Se trata de un estudio analítico, prospectivo, transversal, con un enfoque cuantitativo, realizado en un hospital donde la muestra consistió en 54 pacientes en una cardiología. Se utilizó una forma semiestructurada, una escala antropométrica y una cinta métrica. **Resultados**: En relación con el índice de masa corporal, se impuso eutróficos y pre-obesidad (40,7%). Se observa la ausencia de riesgo cardiometabólico. En cuanto a los hábitos de vida, el 33,3% tienen o han tenido hábitos de alcohol hábito de fumar, el 53,7% ha consumido y el 83,3% no hace ejercicio. La hipertensión se encuentra en 51,8% de la población. El diagnóstico fue insuficiencia cardiaca frecuente (29,7%). Las pruebas de laboratorio no mostraron cambios significativos. **Conclusión**: El estado nutricional de los pacientes con enfermedad cardiovascular no se caracteriza por alteraciones antropométricas y de laboratorio, sino por la historia clínica y estilo de vida de los pacientes.

Descriptores: Enfermedades cardiovasculares, Evaluación nutricional, Factores de riesgo.

INTRODUCTION

The prevalence of cardiovascular disease (CVD) mortality in Brazil is 30%, and since the 1970s this situation has not changed significantly, accounting for more than 10% of all hospital admissions in Brazil, which represents a strong impact on health expenditures.[1] Minas Gerais (MG) was the third Brazilian State in 2009, with the highest number of deaths due to other diseases of the circulatory system, losing only to the States of *São Paulo* (SP) and *Rio de Janeiro* (RJ).[2]

Chronic non-communicable diseases, especially diseases of the circulatory system, cancer, Diabetes Mellitus (DM) and chronic respiratory diseases, constitute a significant public health problem in Brazil and affect mainly the most vulnerable groups, such as the elderly, Low income and low levels of schooling.[3] These diseases, including CVD, are characterized by an extensive period of latency, long evolution, injuries and complications that

increase morbidity and mortality, requiring continuous interventions and health care expenses, reaching 70% of health spending.[4]

Nowadays, the change in the nutritional profile of the Brazilian population due to the increase in obesity and the reduction of malnutrition is related to the adoption of a diet low in healthy foods and high in fats and other caloric foods contributing to the increase of these diseases.[5] CVD Is a preventable disease, but because it requires changes in people's lifestyles, prevention becomes more difficult.[6] Risk factors for CVD may be non-modifiable as age and family history, and modifiable as Systemic Arterial Hypertension (SAH), DM, smoking, alcohol consumption, obesity, sedentary lifestyle and dyslipidemia.[7]

The impairment of nutritional status is common among hospitalized patients and has a negative influence on morbidity and mortality rates. Cardiopathic patients have a double risk of mortality when they are malnourished or at nutritional risk. Malnutrition increases mortality and length of hospital stay by reducing immunity, increasing the risk of infections, decreasing blood levels of protein, causing edema, and increasing post-operative complications. Therefore, the evaluation of the nutritional status of hospitalized patients can be determinant for the survival of these patients, since it allows adequate intervention in the possible nutritional risk frameworks.[8,9]

Thus, this study aimed to assess the nutritional status of patients bearing CVD admitted to a hospital in Montes Claros, MG, Brazil.

METHODS

TIt is an article from the monograph entitled "Nutritional profile of patients with cardiovascular diseases hospitalized in a hospital in *Montes Claros* (MG)" presented to the Nutrition Department at *Faculdades Unidas do Norte de Minas/FUNORTE, Montes Claros, Minas Gerais (MG)*, Brazil, 2012.

It is an analytical, prospective, and cohort study with quantitative approach, performed from August to September 2012, in patients with CVD admitted to the cardiology ward of the Aroldo Tourinho Hospital, located in the city of *Montes Claros (MG)*. The sample consisted of 54 patients hospitalized during the study period in which they were eligible for participation. The following exclusion criterion for non-participation in the study was adopted: patients who were unable to walk, as they were unable to go to the scale to measure the anthropometric measurements.

To carry out the research, a socioeconomic and demographic form and general health data was used, with its own elaboration, in order to obtain information on the presence of risk factors for CVD (smoking, alcoholism, sedentary lifestyle and multifactorial genetic inheritance) and to evaluate the variables: gender, age, race or color, marital status and schooling, according to the 2010 Demographic Census Sam-

ple Questionnaire proposed by the Brazilian Institute of Geography and Statistics.[10]

For the information such as diagnosis, associated pathologies and laboratory tests, the secondary data were evaluated through hospital records. For the anthropometric analysis of the nutritional status of the patients, the calculation of the Body Mass Index (BMI), classified according to the parameters established by the World Health Organization (WHO) for adults and the classification of Lipschitz for the elderly was used.[11,12] For this an anthropometric scale of Filizola brand was used.

The measurement of waist circumference (WC) was used as a risk indicator for metabolic syndromes and this was classified according to WHO parameters.[13,14] In order to measure this parameter was used retractile metric tape Fiber Glass.

In order to perform the weight measurement, the patient was instructed to wear light clothing, with both feet on the scale, barefoot, distributing the weight equally on the legs and staring at the horizon. To measure the height, the patient had his back turned to the scale with his feet together and his head according to the Frankfurt plan.[15] To measure the WC, the technique recommended by the WHO was used, where the measurement is obtained at point Between the iliac crest and the last rib and the reading made at the time of expiration.[14] During the measurement the patient was advised to remain in orthostatic position, wearing the least possible clothing and the researcher was careful not to compress tissues.[16]

The data were tabulated, analyzed and interpreted using the Statistical Package for the Social Sciences (SPSS) software. Preliminary analyzes, prevalence estimates, means and standard deviations were conducted to characterize the nutritional profile, risk factors for CVD, and sociocultural variables of the patients participating in the study. In a second moment, inferential analyzes were conducted to test the current and usual weight variation.

The study followed the ethical precepts established by the Resolution No. 466/2012 from the National Health Council in which it regulates research involving human beings.[17] The research project was appreciated and approved by the Research Ethics Committee of the *Faculdades Unidas do Norte de Minas (CEP FUNORTE)*, by means of consolidated Legal Opinion No. 75.469/2012, Certificate of Presentation for Ethical Appraisal No. 05568012.7.0000.5141. The participants were duly orientated regarding the guidelines of the study in which they authorized the research by signing the Free and Informed Consent Term.

RESULTS

The study included 54 patients, from both genders, with no percentage difference and within an age group average of 60 years old, mostly brown skin color (59.3%), married

(63%) and incomplete elementary school (38.9%) as can be observed in Table 1.

Variáveis		n=54	%	Média (p-valor)
Idade		-	-	60,41(±15,879)
Sexo				
	Masculino	28	51,8	-
	Feminino	26	48,2	-
Cor/Raça				
	Parda	32	59,2	-
	Branca	16	29,6	-
	Preta	05	9,2	-
	Amarela	01	2,0	-
	Indígena	00	00	-
Estado civil				
	Casado(a)	34	62,9	-
	Viúvo(a)	14	25,9	-
	Solteiro(a)	05	9,2	-
	Separado/Disquitado/Divorciado	01	2,0	-
Escolaridade				
	Analfabeto	14	25,9	-
	Ensino fundamental incompleto	21	38,8	-
	Ensino fundamental completo	13	24,0	-
	Ensino médio	06	11,3	-

Table 1 – Socioeconomic profile of CVD bearing patients hospitalized at a referral hospital of Montes Claros (MG), 2012. (n=54).

Table 2 shows the anthropometric characteristics of the studied population where it is observed that there was no statistically significant weight loss. The current mean weight and height of the study population are 65.39 kg and 1.59 m, respectively. In relation to BMI, we observed a higher number of eutrophic and pre-obese individuals with the same percentage (40.7%). It is also observed that the absence of cardiometabolic risk is significant in both genders, with 33.3% for men and 44.4% for women.

Variáveis		n=54	%	Média (p-valor)
IMC		-	-	25,74(±3,955)
Peso habitual		-	-	64,79(±14,461)
Peso atual		-	-	65,39(±13,257)
Altura		-	-	1,59(±0,108)
CC		-	-	91,06(±9,583)
Classificação do IMC				
	Magreza grau III	00	00	-
	Magreza grau II	00	00	-
	Magreza grau I	02	3,8	-
	Eutrofia	22	40,7	-
	Pré-obesos	22	40,7	-
	Obesidade grau I	08	14,8	-
	Obesidade grau II	00	00	-
	Obesidade grau III	00	00	-
Classificação da CC				
Homens	Presença de RCM	10	18,5	-
	Ausência de RCM	18	33,3	-
Mulheres	Presença de RCM	02	3,7	-
	Ausência de RCM	24	44,5	-

RCM = Risco Cardiometabólico.

Table 2 – Anthropometric profile of CVD bearing patients hospitalized at a referral hospital of Montes Claros (MG), 2012. (n=54).

Regarding the living habits, 33.3% have or have had smoking habits, with an average daily consumption of 17.11 cigarettes. Drinking habits are present in 53.3% of the population; out of which 44.8% use alcoholic beverages three times per week and the most consumed beverages are beer (34.48%) and cane alcohol (31.03%). Only 16.7% of the sample practiced physical activity, most of them walking (55.56%) with a frequency of three times per week (88.89%) (Table 3).

Variáveis	n=54	%	Média/dia (p-valor)
Hábito tabagista	n=18	33,3	-
Consumo de cigarros por dia	-	-	17,11(±15,818)
Hábito etilista	n=29	53,7	-
Freqüência de consumo de bebidas(*)			
Uma vez por semana	10	34,4	-
Três vezes por semana	13	44,8	-
Sete vezes por semana	06	20,8	-
Tipos de bebidas consumidas(**)			
Cachaça	09	31,0	-
Cerveja	10	34,4	-
Cachaça e cerveja	03	10,3	-
Cachaça, cerveja e conhaque	01	3,4	-
Cerveja e vinho	01	3,4	-
Vodka, conhaque e cerveja	01	3,4	-
Todos os tipos	04	14,1	-
Prática de atividade física			
Praticam atividade física	09	16,7	-
Não praticam atividade física	45	83,3	-
Frequência de prática de atividade física(***)			
Uma vez por semana	01	11,1	-
Duas vezes por semana	01	11,1	-
Três vezes por semana	05	55,5	-
Cinco vezes por semana	02	22,3	-
Tipo de atividade física(***)			
Caminhada	08	88,9	-
Ginástica	01	11,1	-

(*)Percentual para um *n* igual a 29.
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(***)Percentual para um *n* igual a 9.

Table 3 – Living habits profile of CVD bearing patients hospitalized at a referral hospital of Montes Claros (MG), 2012. (n=54).

Table 4 shows a high prevalence of DM (19.2%), SAH (51.8%) and dyslipidemia (29%). Regarding the diagnosis, there was a predominance of Cardiac Insufficiency (CI) (30.2%) and Chagas Cardiomyopathy (18.5%). It is important to note that the same patient may present more than one disease. Among all patients, 77.7% reported having a multifactorial genetic inheritance.

Variáveis	n	%
Patologias associadas (n=83)		
DM	16	19,2
HAS	43	51,8
Dislipidemia	24	29,0
Diagnóstico (n=54)		
ICC	16	30,2
Cardiopatia chagásica	10	18,5
Angina instável	08	14,8
Arritmia cardíaca	05	9,2
IAM	04	7,4
Obstrução arterial	02	3,7
Bradiarritimia	01	1,8
Cardiopatia isquêmica	01	1,8
EAPH	01	1,8
Estenose mitral reumática	01	1,8
HAS descompensada	01	1,8
Imunodeficiência coronariana	01	1,8
Insuficiência cardíaca isquêmica	01	1,8
Insuficiência coronariana	01	1,8
Massa atrial direita	01	1,8
Herança genética multifatorial (n=54)		
Total	42	77,7

ICC = Insuficiência Cardíaca Congestiva; IAM = Infarto Agudo do Miocárdio; EAPH = Edema Agudo Pulmonar Hipertensivo.

Table 4 – Clinical diagnosis profile of CVD bearing patients hospitalized at a referral hospital of Montes Claros (MG), 2012.

Only one patient had albumin exam, High Density Lipoprotein (HDL) and Low Density Lipoprotein (LDL), which was not a representative number in the sample, as were total cholesterol (TC) and triglycerides, and only five patients had the tests. The mean sodium was 136.03 mg/dl, the red blood cell count (RBC) was 4,826,130 mm³ for men

and 4,670,090 mm³ for women; the hemoglobin (Hb) was 13.34 g/dL for men and 12.36 g/dL for women and hematocrit (Ht) 43.75% for men and 39.63% for women. The only change in the mean values of the laboratory tests was found in the mean Hb for men, which is below the reference values, but without statistical significance (Table 5).

Variáveis	n=54	%	Resultado (p-valor)
Exames bioquímicos			
Nível de albumina	01	1,8	4,2g/dl
Hemograma			
Hm (Homens)	23	42,5	1.826.130(±829,471)mm³
Hm (Mulheres)	21	38,8	4.670.090(±665,439)mm³
Hb (Homens)	23	42,5	13,34(±2,356)g/dl
Hb (Mulheres)	21	38,8	12,36(±1,752)g/dl
Ht (Homens)	17	31,4	43,75(±5,586)%
Ht (Mulheres)	14	25,9	39,63(±10,744)%
CT	05	9,2	186,80(±39,544)mg/dl
HDL	01	1,8	55mg/dl
LDL	01	1,8	164mg/dl
Sódio	38	70,3	136,03(±5,838)mEq/l
Triglicerídeos	05	9,2	166,60(±96,363)mg/dl

CT = Colesterol Total.

Table 5 – Laboratorial profile of CVD bearing patients hospitalized at a referral hospital of Montes Claros (MG), 2012. (n=54).

DISCUSSION

Aging increases susceptibility to the development of several chronic non-communicable diseases, especially CVD.[18] This can be proven by the present study where the mean age found among the patients with heart disease was 60 years old. In order to verify if there is difference between the means of measured weight and declared weight (habitual), a test of adhesion of the variables was first made, the Kolmogorov-Smirnov test with 95% of significance was chosen, and in all the variables was found that they have a normal distribution with p value greater than 0.05. Then, because it is a paired sample and with data that has a normal distribution, the appropriate test is the paired t-test with 95% significance. Therefore, we found that the means of measured weight and declared weight (habitual) are equal to p value equal to 0.826, indicating that there is no significant difference between the means.

In the present study, the BMI average (25.74 kg/m²) were presented in eutrophic stage for patients of both genders, agreeing with the average found in another study in which it was adequate for both sexes.[18] Researcheshave found a higher prevalence of obesity grade I and pre-obese.[19] The mean WC indicates a low cardiovascular risk for both sexes, being in agreement with the BMI average that was classified as eutrophic stage. The results of two studies contradict that found in which there was a prevalence of central obesity.[18,20] The same happens in a study conducted in Brasília, Distrito Federal (DF), where 86.4% of the women and 57.1% of the men had elevated WC.[21]

The proportion of smokers in this study was 33.3%, higher than those in the Eastern region of Goiânia (GO) showing 16.2%,[22] and in a Thoracic Pain Unit in the city of Vassouras (RJ) showing23%,[7] and also in a city in the South of Brazil with 21.3%.[6] According to the studies, 53.3% of

the sample are or were already alcoholic. Much higher than the percentages found in a scientific research carried out at the Regional Rehabilitation Center of Araraquara and at the Thoracic Pain Unit of *Vassouras (RJ)*, where they found 4% and 8.6%, respectively.[23,7]

Currently, physical inactivity has increased mainly in the lower economic classes and with low schooling,[20] a fact confirmed by the present study in which only 16.7% of the sample practice physical activity, as evidenced in another study carried out in *Vitória, Espírito Santo (ES)*, who found 60% of sedentarism.[24] In diabetic patients, the CVD mortality is two to four times greater than in the rest of the population. This risk is increased if associated with other coexisting risk factors. On the other hand, regardless of this association, the risk of CVD is proportionally related to the increase in blood glucose values.[25] The percentage of CVD patients who also have DM is 29.6%, close to that found in a study conducted in a Family Health Unit located in the Eastern region of the city of *Londrina, Paraná (PR)* (22.9%).[26]

There is a linear relationship between blood pressure values and the risk of death from CVD; the mortality rate increases as blood pressure is elevated. Therefore, SAH is considered the most relevant among modifiable risk factors.[1,7] This can be corroborated by the data obtained in the present study, in which 79.6% of the cardiopathic patients presented SAH. In a study carried out in *Vassouras (RJ)*, the prevalence of SAH was 65%. The number of patients with dyslipidemia in the sample is 44.4%, higher than the amount found in a study carried out in Rio de Janeiro State, where a percentage of 22.9% was found.[7]

In this study, the prevalence of CI among the pathologies of the patients was 29.7%. Among CVD, CI is the most frequent cause of hospitalization.[27] In this study, the second place found was for patients bearing Chagas cardiomyopathy (18.5%). The most serious clinical manifestation of Chagas' disease is cardiac involvement reaching 25-30% of those infected and may lead to CI, cardiac rhythm disturbance and thrombus-electrolyte phenomena.[28] The overall prevalence of multifactorial genetic inheritance for CVD was 77.8%, which is higher than that found in Rio de Janeiro State (49.4%).[7] Although a large percentage of the sample is SAH (79.6%), the average values of sodium found are within the reference values.[29] The complete blood count is used for evaluation of the nutritional status and may be an indicator of the malnutrition status.[30] No significant changes were found, neither was found a significant number of malnourished patients according to the BMI classification.

CONCLUSIONS

According to the data obtained in this study, patients are eutrophic, since they did not present obesity (risk factor for CVD) or malnutrition (debilitated by disease and/or hospitalization), this is evidenced by biochemical tests and anthropometric evaluation. Nonetheless, the risk factors presence

related to lifestyle, multifactorial inheritance and associated diseases (dyslipidemia, hypertension and DM) were found in the study population. Consequently, the nutritional profile of patients with CVD in the studied population is not characterized by anthropometric and laboratory alterations, but by the clinical history and life habits of the patients.

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