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Clinical-nutritional profile and dietary intake of participants of the Elderly Program, Ouro Preto-MG

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Abstract

Objective: To evaluate the clinical, nutritional and food profile of the participants of the *Programa Terceira Idade Vitalidade e Cidadania*, Ouro Preto, Minas Gerais, Brazil. *Materials and Methods:* Cross-sectional study with 28 individuals aged 60-83 years. Anthropometric analysis was made using weight, height, waist circumference and calculating the body mass index. The biochemical data analyzed were: lipid profile and fasting glucose. Food intake assessment was performed by food frequency questionnaire. For statistical analysis, it was used the PASW software version 17.0. *Results:* This study showed prevalence of overweight (53.6%), abdominal obesity (67.9%), glucose intolerance (56.5%) and hypertension (82%). Although the elderly (100%) reported intake of cereals, legumes, fruits and vegetables, the dietary analysis showed intake of processed food (93%) and foods with high glycemic index (89%). *Conclusion:* Most elderly had excess weight, abdominal adiposity, glucose alterations and hypertension, high consumption of processed foods, which reinforces the need for specific nutritional guidelines for this age group.

Key words: Aged. Food Consumption. Nutrition. Weight Gain.

Introduction

Life expectancy of the global population has been increasing considerably. In Brazil, the elderly population may exceed 30 million people and represent nearly 13% of the overall population in the next 20 years.[1] According to IBGE's estimates,[2] the state of Minas Gerais had a population of 19,597,330 people in 2010, of which 2,311,084 (11.8%) were senior citizens. A similar percentage was observed in Ouro Preto city, in the same period, where 11.4% of the population was over 60 years old.[2]

The increase of the elderly population is one of the main concerns in the health field.[3] Aging can cause functional changes in the body of the elderly such as a decrease in height and body mass, reduction of lean mass and increase of adiposity.[4] In some cases, smell and taste become less accurate and chewing can be inefficient, due to teeth loss.[5] In addition, the population aging has as a consequence an increased prevalence of chronic diseases, such as diabetes and hypertension. The increased number of cardiovascular diseases and diabetes is directly associated with higher functional incapacity and increased morbidity and mortality among the elderly.[3,5]

Thus, the nutritional assessment of older individuals is essential to identify their health status, and anthropometry is one of the commonest methods used in epidemiological studies and in clinical practice because it is noninvasive, low cost and easy to perform.[6] Biochemical analysis is necessary for the clinical follow-up and monitoring of the health condition of this age group.[7]

Taking into account that the older people have typical characteristics of age that may compromise their nutritional status, it is important to understand the role of food and nutrition either in promoting or maintaining the health of the elderly.[8] In this context, it is necessary to investigate the eating habits and promote dietary guidelines to prevent and control health disorders.[8,9] Therefore, the aim of this study was to assess the clinical-nutritional profile and eating habits of the participants of the *Programa Terceira Idade Vitalidade e Cidadania* (Elderly Vitality and Citizenship Program), in Ouro Preto, Minas Gerais, Brazil.

Methods

Cross-sectional study conducted from May to July 2012 with old individuals that participate in the extension program of the Federal University of Ouro Preto (UFOP) – *Programa Terceira Idade Vitalidade e Cidadania* (Elderly Vitality and Citizenship Program).[10]

Definition of the group to be studied was based on convenience sampling, in which all participants of the Elderly Program were invited to enroll. Criteria of inclusion were interest in attending, both sexes, aged 60 years or over and completion of the food frequency questionnaire (FFQ). Of 46 individuals who accepted to participate in the survey, five were less than 60 years old and 13 did not complete the FFQ. Thus, the studied sample consisted of 28 elderly subjects of both sexes with age between 60 and 83 years.

The study was carried out in conformity with the Declaration of Helsinki and Resolution 466/12 of the National Health Council and was approved by the Research Ethics Committee of the Federal University of Ouro Preto (CAAE: 0003.0.238.000-05/2005).

Anthropometric, biochemical and nutritional conditions of the elderly were evaluated. The following items were measured in the anthropometric assessment: weight (kg), height (m), waist circumference (WC) (cm) and, subsequently, the body mass index (BMI) was calculated. Body weight was measured on a portable digital scale (Tanita®: 150 kg capacity and 100 g precision) while the elderly were barefoot and wearing light clothes. Height was measured with a stadiometer (Alturexata®: 2-m maximum length divided in cm and subdivided in mm).

BMI was calculated according to the following formula: BMI = weight (kg)/ height^2 (m^2), and the nutritional status was classified according to Lipschitz.[11] The WC was measured using an inelastic tape positioned around the midpoint between the last rib and the iliac crest. Classification was according to the parameters defined by the World Health Organization (WHO).[12]

The lipids and glucose biochemical assessment (total cholesterol and fractions, triglycerides) was performed at the Pilot Laboratory of Clinical Analyses – Pharmacy School of UFOP. Total cholesterol, LDL cholesterol and HDL cholesterol and triglycerides were classified according to the reference values described in the 5th Brazilian Guidelines for Dyslipidemias and Atherosclerosis Prevention,[13] while the plasma glucose values were based on the guidelines of the Brazilian Diabetes Society.[14] Chronic diseases such as diabetes and hypertension were also evaluated, based on clinical diagnosis previously made and informed by the volunteers during the interview.

Food consumption was investigated by means of a FFQ that was developed based on studies conducted by Freitas[15] and Freitas et al.[16] The questionnaire comprised 200 foods divided into the following groups: breads, cereals, roots and tubers; vegetables; fruits; beef, pork, chicken, fish and eggs; legumes; milk and dairies; oils and fats; sugars; ready-to-use sauces, soft drinks, and others. The frequency of foods consumption was assessed on a daily basis. The food inquiry was conducted using photographs of servings and home cooking measurement utensils to allow for a better view of the foods by the elderly. Dietary analysis consisted of recording the usual intake of each food, i.e., if the elderly usually consumed or not some foods. The foods consumed daily by at least 50% of the elderly individuals were considered as integral part of usual consumption.[17]

Data were analyzed by the Predictive Analytics SoftWare (PASW Statistics), version 17.0. A descriptive analysis of the anthropometric and biochemical data was performed, which were expressed as mean, standard deviation, minimum and maximum values. Food intake was assessed by frequency. Chi-square test was used to examine the association between the nutritional status and chronic diseases, with a 5% significance level.

Results

Of 28 elderly individuals that participated of the study, 71.4% were women and 28.6% were men. Mean age was 67.91 years ± 5.34.

Table 1 shows the descriptive values of the anthropometric measures and the lipid and glycemic profile. In the BMI-based anthropometric assessment, 53.6% of the elderly individuals were overweight, 35.7% were eutrophic (normal) and 10.7% were underweight, without statistical difference between both sexes. However, prevalence of overweight (60%) was higher among women, while there was prevalence of eutrophy (62.5%) among men. Based on the WC analysis, 67.9% of the elderly individuals presented very high values. Mean WC values for women and men were 91.45 cm ± 11.74 and 94.66 cm ± 9.55, respectively. Between the groups, most of the elderly women (80%) presented high to very high WC values, while most of male individuals (62.5%) presented adequate WC values. There was no difference between the sexes.

In the biochemical analysis, 47.8% of the subjects had adequate cholesterol levels; 39.1% were classified as being in the limit of cholesterol levels and 13% showed hypercholesterolemia. The majority of women (50%) had normal levels of cholesterol, while 60% of the men were at the limit. Regarding LDL-cholesterol, 74% of the individuals showed low risk for developing cardiovascular

diseases and 26% indicated moderate to high risk. In the analysis between groups, most of the men (80%) and women (72%) were classified at low risk. With regard to HDL-cholesterol, 100% of the elderly showed adequate values.

Regarding triglycerides, most of the individuals (61%) were within the normal limits, while 39% showed high levels. Among men, 60% of them showed high levels while 67% had adequate levels of triglycerides.

Regarding plasma glucose, 56.5% of the elderly participants showed abnormalities such as diabetes, glucose intolerance or hypoglycemia. In the group of men, 80% were diagnosed with hyperglycemia or diabetes. Regarding women, 52% had high blood glucose levels.

Table 1. Anthropometric and biochemical data of participants of the *Programa Terceira Idade Vitalidade e Cidadania* (Elderly Vitality and Citizenship Program). Ouro Preto-MG, Brazil, 2012.

Variables	Total Sample	Women	Men	
		Mean ± DP		P
Weight (kg)	70.1±14.67	68.07±13.71	75.18±16.70	0.254
Height (m)	1.57±0.08	1.53±0.58	1.65±0.67	0.001
BMI (kg/m^2)*	28.49±5.03	28.89±5.40	27.49±4.08	0.515
WC (cm)†	92.37±11.08	91.45±11.74	94.66±9.55	0.499
Cholesterol (mg/dl)§	208.74±34.64	194.60±26.76	212.67±36.18	0.313
LDL-c (mg/dl)§	116.16±34.63	107.26±25.74	118.63±36.95	0.529
HDL-c (mg/dl)§	64.48±14.17	54.60±9.81	67.22±14.16	0.071
Triglycerides (mg/dl)§	133.26±68.30	164.20±86.49	124.67±62.58	0.262
Glucose (mg/dl)‡	108.83±35.43	111.60±24.34	108.06±38.49	0.848

SD: standard deviation; BMI: body mass index; WC: waist circumference; LDL-c: high-density lipoprotein; HDL-c: low-density lipoprotein. M: male; F: female. *Lipschitz[11]. †*World Health Organization*[12]. §V Brazilian Guidelines for Dyslipidemias and Atherosclerosis Prevention [13].‡Guidelines of the Brazilian Diabetes Society[14].

With respect to chronic diseases, 82% of the sampled individuals were diagnosed with high blood pressure, while 25% had diabetes. Among the women, 25% had diabetes and 75% had high blood pressure. Among the men, 25% had diabetes and 100% high blood pressure. The hypertensive and diabetic individuals accounted for 21.4% of the sample. In the analysis of the nutritional profile and chronic diseases, there was no statistically significant association between overweight and abdominal adiposity with the presence of chronic diseases. However, 84% of the hypertensive elderly individuals had high levels of CC.

According to the dietary analysis, 100% of the elderly assessed consumed rice, beans, fruits and vegetables. However, the present study also showed a high prevalence of senior individuals who used to eat biscuits (89%), canned foods (86%), snacks (89%), ready-to-use sauces and pasta (93%). Regarding the usual food consumption by the diabetic individuals, it was found that 81% of them ate sugars and cakes, 92% ate sugary snacks such as sweets, candies, ice cream and chewing gums and only 46% of the diabetic elderly used sweeteners. The dietary analysis of the hypertensive individuals showed that 87% of them usually ate canned foods, 91% ready-to-use sauces and 65% of them consumed artificial juices, sausages and alcoholic beverages. Figures 1 and 2 show the prevalence of foods consumption by the elderly under study.

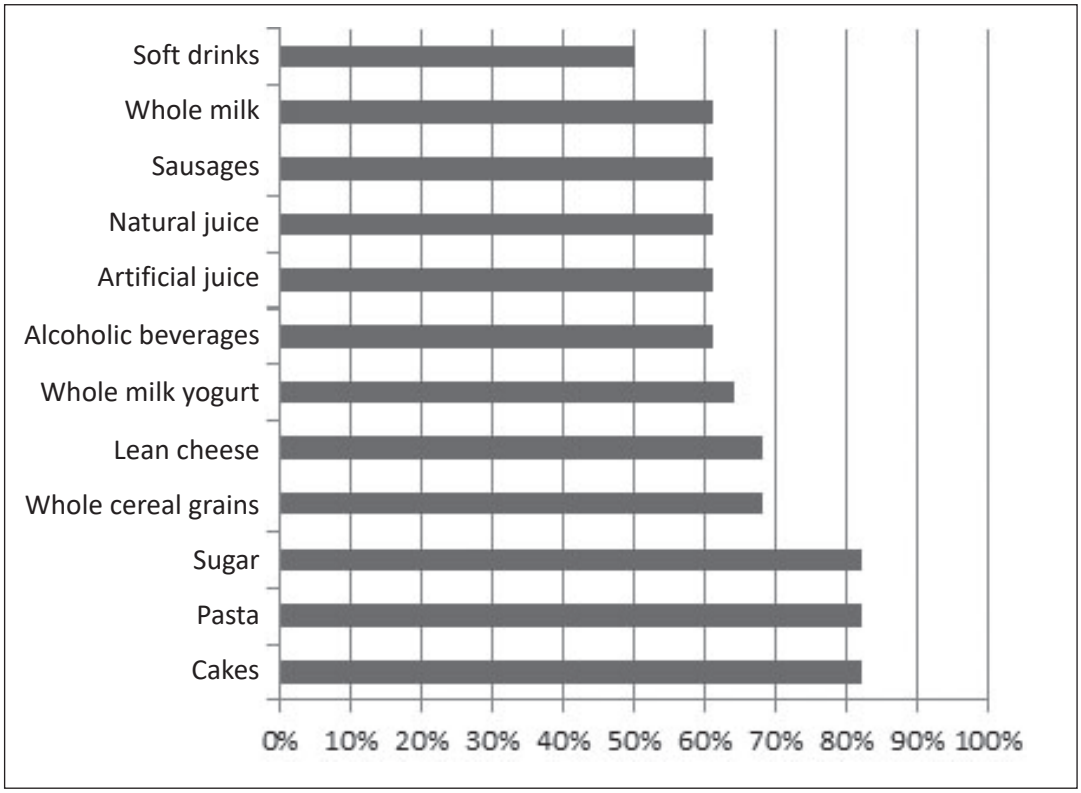

Figure 1. Foods consumed by 50% to 82% of the participants of the *Programa Terceira Idade Vitalidade e Cidadania* (Elderly Vitality and Citizenship Program). Ouro Preto-MG, Brazil. 2012.

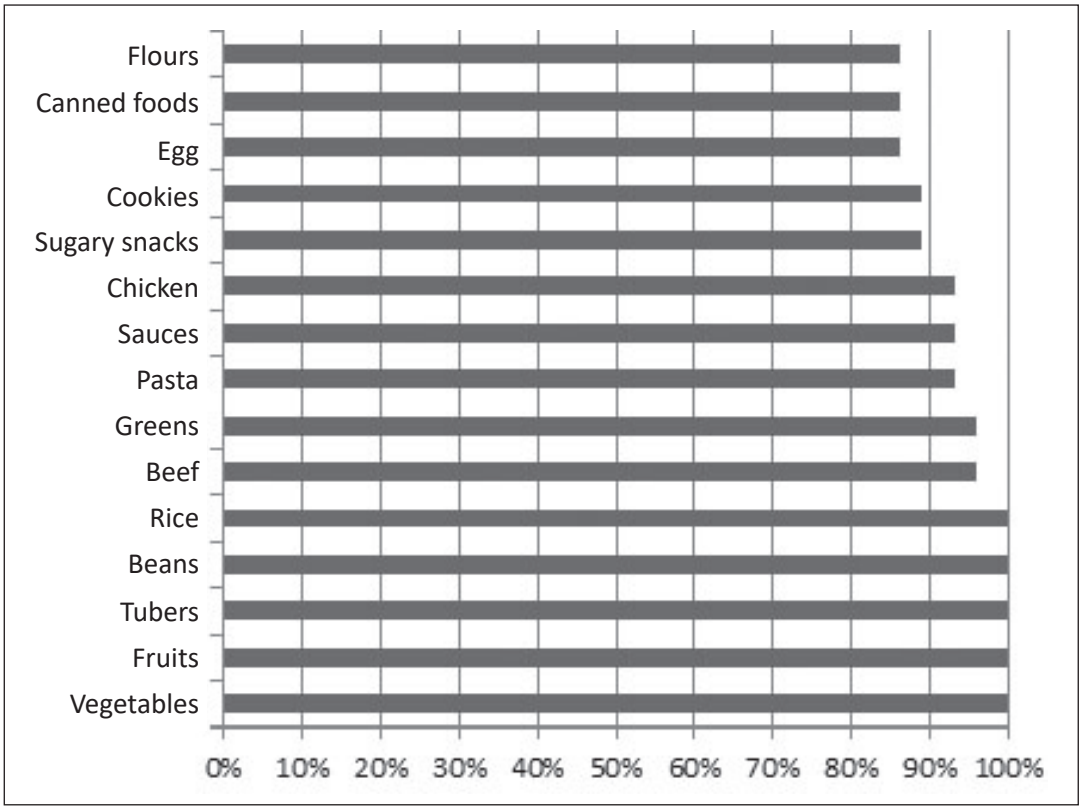

Figure 2. Foods consumed by 86% to 100% of the participants of the *Programa Terceira Idade Vitalidade e Cidadania* (Elderly Vitality and Citizenship). Ouro Preto-MG, Brasil. 2012.

Discussion

This study showed that most of the elderly sampled were women. This result is similar to the one found in a study conducted by Ferreira & Rosado,[18] where a high attendance of women (84.4%) in programs for seniors was observed, compared to only 15.6% of men. A survey conducted in João Pessoa-PB and Fortaleza-CE confirms this trend, indicating the presence of 79.7% and 66% of elderly women in third-age programs in the respective capitals.[19] According to Trindade,[20] the prevalence of women in these programs could be due to the greater concern of women with health.

The anthropometrics analysis showed overweight and abdominal fat in the population under study, especially among the women. According to Silveira et al.[3], a possible explanation for the

higher prevalence of overweight in women is due to the fact that they accumulate more visceral fat than men. However, the use of BMI in the assessment of senior individuals has some difficulties because of body alterations such as decreased stature, increased adiposity and reduced lean mass.[21] Therefore, BMI should be associated with indicators like WC for a better accuracy of the elderly's nutritional assessment.[21,22]

As WC provides an estimate of abdominal fat, such measure can be associated with metabolic disorders and cardiovascular risks. However, there are no specific cutoff points for the elderly population which consider the body changes caused by age.[23] In this context, it is worth emphasizing the need to develop reference parameters for data of body composition with definition of specific values for elderly people, which will help identify nutritional disorders in old age.[24]

Regarding the biochemical analysis, most of the elderly presented adequate values of cholesterol, LDL-cholesterol and HDL-cholesterol. However, high levels of total cholesterol and LDL-cholesterol associated with low levels of HDL-cholesterol are key factors of risk for the incidence and death by cardiovascular diseases.[25,26] Therefore, adequate serum cholesterol values have positive effects on the elderly's health. In addition, LDL-cholesterol has been studied as a marker of longevity, and the association of high levels of LDL-cholesterol with other risk factors may result in a shorter life expectancy.[27] Prospective study conducted by Weverling-Rijnsburger et al.[27] showed that the individuals with high LDL-cholesterol levels had cardiovascular diseases as the main cause of death.

In the analysis of triglycerides, most of the elderly individuals showed normal levels. However, when comparing the groups, the majority of men presented hypertriglyceridemia, while most of the women had adequate levels. This can be due to the sample size of male individuals participating in the study. The results differ from the ones found in a study carried out by Silva,[28] where 75% of men and 68% of women had triglycerides values within the normal standards.

Regarding fasting glucose, most of the studied individuals showed intolerance to glucose or diabetes and only 35.71% of the elderly were within the normal range. This differs from the results found by Bueno et al.[21] in a study with 61 senior individuals enrolled at the Open University of the Third Age, in which most of the elderly (96.7%) had normal glucose levels. It is worth emphasizing the importance of maintaining glucose levels within the normal standards. When high, they are related to high-prevalence chronic complications in diabetic patients.[29] To prevent these problems, adopting a healthy diet and regular physical activity can yield beneficial effects on the elderly's glucose tolerance and health. In this context, the Elderly Vitality and Citizenship Program[10] provides nutritional assistance, lectures on healthy eating and practice of physical activities, aiming to contribute to an improved elderly's health.

With respect to the dietary assessment, all respondents reported consuming rice and beans, which indicates that the senior population examined in the present study maintains the habit of consuming healthy staple foods that comprise the Brazilian standard diet.[30] Similar results were found in a study conducted by Machado et al.[31] with 35 elderly individuals in Rio de Janeiro city, which found that rice and beans still are the staple foods consumed by nearly 100% of this population. In addition, the elderly participants of this study reported consuming fruits and vegetables on a daily basis. However, despite reporting the intake of the foods recommended by the Adapted Food Pyramid[32] and by the Brazilian Food Guide,[33] such as cereal grains, legumes, fruits and vegetables, dairy products, eggs and meats, the ingestion of overly processed foods and with high glycemic index was high, once 89% of the elderly reported consuming biscuits and snacks every day.

Regarding the food intake by the diabetics, it is important to emphasize that the high consumption of sugar, cakes and sweet snacks and the low consumption of sweeteners are of concern, once the main recommendation for diabetics is the reduction of sugar intake.[29] Regarding the dietary intake of the elderly with hypertension, intervention measures are necessary, because the association of increased blood pressure with aging is higher in the population with high sodium intake. In addition, a high intake of alcoholic beverages can also contribute to the an increase of blood pressure.[34]

In short, most of the elderly enrolled in this study were overweight, with abdominal fat, glycemic alterations and high blood pressure. In addition, the elderly also indicated a high intake of overly processed foods and with high glycemic index, despite consuming staple foods considered healthy, such as rice, beans, fruits and vegetables. Thus, the results showed the importance of considering specific educational interventions on the dietary habits of the elderly with diabetes and hypertension and older people in general, as a measure of control and prevention of chronic diseases associated with inadequate eating practices.

Thus, detail analyses of the elderly's nutritional status is of key importance to meet and reinforce the need for interventions, with the aim of contributing to an improved quality of life of the old population based on nutritional guidance.[35]

Conclusions

The present study showed that most of the elderly participants indicated overweight, high WC, glycemic alterations and high blood pressure. In addition, ingestion of overly processed foods and with high glycemic index was observed, mainly among the diabetics, and a high consumption

of foods with high content of sodium by those with hypertension. This shows the importance of nutritional monitoring of this population to adequate the dietary practices in the prevention and control of chronic diseases.

Therefore, knowing the anthropometric, biochemical and dietary status of the elderly contributes to defining specific interventions and nutritional guidance to promote the health of the elderly population.

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