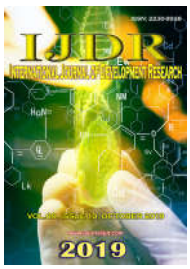
ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 09, Issue, 10, pp. 30389-30393, October, 2019



RESEARCH ARTICLE OPEN ACCESS

NUTRITIONAL EVALUATION, ENERGY CONSUMPTION AND ALTERATION IN FAST GLUCEMIA IN ELDERLY

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ARTICLE INFO

Article History:
Received 03rd July, 2019
Received in revised form
17th August, 2019
Accepted 20th September, 2019
Published online 16th October, 2019

Key Words:

Aging. Nutritional Assessment.
Fasting blood glucose.

ABSTRACT

With the aging of the population and the increasing life expectancy, there was a predominance of chronic no communicable diseases. The nutritional status of the elderly population commonly interacts with changes intrinsic to aging as well as lifestyle and changes in the health profile of individuals. This is a cross-sectional and quantitative research, made up of 93 elderly people of both genders. Data were collected through laboratory examination, questionnaires pre-existing Elder Abuse, food frequency (FFQ) and socio-demographic disease. Statistical analysis was performed using the SPSS statistical program® 25.0. Results were divided into patients with fasting glucose changes, which is the dependent variable of the analysis. Subdivided into two groups: those who take or not medications to control blood glucose, with a population of elderly with an age average of 68.44 years who take medications and those who do not, have an age average of 70.14 years. The Spearman correlation showed that patients taking blood glucose control medication have a negative and moderate correlation between glucose and age (r = -0.489) and between glucose and body mass index (r = -0.102). This indicates that glucose is increasing according to the variation of these variables. In patients who do not take medication, it is observed that there is a positive and moderate correlation between the increase in blood glucose and the patient's age (r = 0.175) and between glucose and body mass index (r = 0.242). That the older and overweight is an increase in glucose. Not getting positive results in the other variables. The aim of the present study is to analyze the correlation of nutritional assessment, energy consumption and fasting glucose changes in elderly diabetics who use or not medications to control blood glucose. In this context, data on food consumption and biochemical tests are extremely important in the assessment and evolution of individuals, as they directly assist in the investigation and monitoring of changes presented by the patient and the most appropriate treatment.

Citation: Poliana Fernandes Gonçalves, Iaggo Raphael David, Ramon Alves Pires *et al.* 2019. "Nutritional evaluation, energy consumption and alteration in fast glucemia in elderly", *International Journal of Development Research*, 09, (10), 30389-30393.

INTRODUCTION

Brazil, as well as other less developed countries, has undergone formidable changes in the health / disease process (Souza, 2018).

Especially in the last fifty years, changes have been noted in the quality and quantity of diet, quality and lifestyle, economic, social and demographic conditions (De Souza, 2017; Stiglitz, 2017; Schoufour, 2018). The Brazilian population aging has been progressively increasing it is estimated that in 2050 the elderly population represents 21.1%, demonstrating a significant increase since in the year 2000 this

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proportion was 5.9% (Teixeira, 2018). With population aging and increasing life expectancy, there have been changes in the epidemiological profile of the population and in parallel with this there is a considerable increase in the prevalence of obesity and, consequently, the prevalence of non-communicable chronic diseases (NCDs)), mainly diabetes, hypertension, cardiovascular diseases and cancers (Pereira, 2016; De Souza, 2017; Ranabhat, 2018). The literature shows that the elderly population is vulnerable, especially in relation to nutritional deficiencies (Hoffman, 2017; Assumpção, 2018). The nutritional status of the elderly population commonly has interaction with changes intrinsic to aging, such as reduced basal metabolism, redistribution of body mass and changes in digestive functioning (Martins, 2016). Changes in diet and body composition occur in different ways and amplitudes, according to the region, culture and socioeconomic conditions of the population (Fochat, 2016; Teixeira, 2018; Santana, 2019), mainly, lifestyle and changes in health profile of individuals (Bluhm, 2019).

Diets with high glycemic indexes result in a rapid increase in blood glucose levels indicating type 2 diabetes (DM2), which is a condition characterized by hyperglycemia, resulting from defects in hepatic and peripheral glucose uptake, insulin secretion, or both (Lee *et al*., 2015; Henson, 2018). Healthy diets have been associated with better glycemic control and decreased risk of dyslipidemias and the development of chronic diseases **(**Previdelli, 2017; American Diabetes Association, 2018). Inadequate food intake of macronutrients characterizes the nutritional status of contemporary society, associated with a sedentary lifestyle, there is a high growth in the development and incidence of T2DM (Bastos, 2018). Carbohydrates make up the group of macronutrients, acting as a signaling molecule, energy sources and structural components (De Carvalho, 2018). They are stored in the body in the form of glycogen, liver and muscles. Hepatic glycogen is used to maintain blood glucose and to meet the energy needs of the brain, nervous system and other tissues. The importance of carbohydrates for human health is exemplified by the close association between chronic metabolic diseases and carbohydrate-rich diets (Jacomini, 2018). Considering the aging population, the increasing prevalence of chronic diseases in this population and the aggregation of these factors with the nutritional status, the present study aimed to analyze the correlation of nutritional assessment, energy consumption and fasting glucose alteration in elderly diabetics who use or no medicines to control blood glucose.

METHODOLOGY

This is an exploratory cross-sectional study of qualitative and quantitative approach, conducted in a city in the interior of Bahia, in a representative sample of the population, composed of 93 elderly, and of both genders, the elderly were grouped by the use of hypoglycemic drug. Data were collected through questionnaires and laboratory examinations, in health units and social groups, conducted from 2016 to 2018, using the stratified random approach method (David, 2019). The same is an umbrella project entitled "Epidemiological Profile of Chronic Diseases in the Municipality of Vitória da Conquista, Bahia, Brazil", which aims to identify and evaluate the epidemiological profile of Chronic Diseases in the Municipality of Vitória da Conquista - Bahia, Brazil. Brazil ("Latitude: 14 51 '58" S, "Longitude: 40 ° 50' 22"W).

The changeglucose was verified by biochemical sample, respecting the required period of minimum fast 8 and at most 12 hours, classified according to the Brazilian Society of Diabetes, with the normal classification ≤ 100mg / Dl and changed to ≥101 mg / Dl, fasting values (SBD, 2018). To obtain data on drug use, the Elder Abuse Pre-existing Disease Questionnaire was applied: *The multinational Prevalence Survey* - ABUEL- which was asked about the use of medication for glycemic control. We also used the WHOQOL-BREF questionnaire (World Health Organization Quality of Life Measurement Instrument), which was developed to evaluate the quality of life (QoL) of individuals; The questionnaire is based on how humans perceive their "position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (David, 2019). To assess food intake was used the food frequency questionnaire (FFQ), one of the most used tools to measure dietary information, constitutes a broad list of food, all items are part of the Brazilian Table of Food Composition (TACO). In addition, it is evident that in order to facilitate interviewees' understanding of the quantities and not induce responses, the displayed portions were based on home measures (David, 2019). Sociodemographic variables (age, education, marital status, family arrangement, employment status, family income, contribution to family income) were collected through a questionnaire, following the standards of the Brazilian Institute of Geography and Statistics (IBGE). from the socioeconomic questionnaire, according to table 1. nutritional assessment was performed by calculating the BMI (body mass index (kg /$^{m2)}$/ height^{2}(cm) collected from patients (David, 2019). From the analysis of the mean and standard deviation, it was observed that the standard deviation of some samples is high indicating that the data points are scattered. by a wide range of values, identifying that the samples are nonparametric. Thus, the Spearman correlation test was performed. Statistical analysis was performed using the SPSS statistical program® 25.0. The significance level was set at $p < 0.05$. Participants were informed about the methods to be used during collection, according to resolution 466/12 (National Health Council), which constitutes international research documents involving humans. The study was approved by the Ethics Committee with Opinion No. 1,859,545. Participation was voluntary and all individuals read and signed the Informed Consent Form (ICF).

RESULTS AND DISCUSSION

The results were divided into patients with fasting glucose alterations, which is the dependent variable of the analysis. Subdivided into two groups: those who take or not medications to control blood glucose, with a population of elderly with a mean age of 68.44 ± 6.36 years who take medications and those who do not, have a mean age of 70.14 ± 7.85 years. The correlation *Spearman* showed that patients taking glycemic control medication have a negative and moderate correlation between glucose and age (r = -0.489) and weakglucose and body mass index (r = -0.102). This indicates that glucose is increasing according to the variation of these variables. In patients who do not take drugs, it is observed that there is a positive and weak correlation between the increase in blood glucose and the patient's age (r = 0.175) and between glucose and body mass index (r = 0.242). That the older and overweight is an increase in glucose. Not getting positive results in the other variables.

Table 1. Sample Characterization

		Use Hypoglycemic		Does Not Use Hypoglycemic	
		n	%	N	%
Age	60 - 69	24	66.7	32	56.2
	70 - 79	11	30.6	15	26.3
	80 - 91	1	2.7	10	17.5
	Total	36	100	57	100
Gender	Male	8	22,2	10	17,5
	Female	28	77,8	47	82,5
	Total	36	100	57	100
Status	Marital Single	12	34,3	35	62,5
	Married	23	65,7	21	37,5
	Total	35	100	56	100
Social Class	C	4	12.5	3	5.7
	D	16	50	28	52.8
	E	12	37.5	22	41.5
	Total	32	100	53	100
Work	Yes	10	27.8	3	5.3
	No	26	72.2	54	94.7
	Total	36	100	57	100

Own survey, 2019.

Table 2. Correlation the use of hypoglycemic and doesn't use hypoglycemic.

Variables	Use of hypoglycemic				Not use hypoglycemic			
	Average	± SD	p-value	CC (r)	Mean	± SD	p-value	CC (r)
Age	68.44	6.36	0.002	-0.489	70.14	7.85	0.194	175
Glucose	187.11	96.592			1-118.68	25.99	1	-
Energy consumption Total	1818.45	1532.07		0.699,070	1598.9	810.93	0.759	- 042
Carbohydrate consumption	286.97	225.63	0,697,	071	253.53	121.46	0.895	-
Body Mass Index	28.40	4.10	0.572	.018-0.102	28.40	4.26	0.072	, 242
Quality of Life Score	3.66	0.46	0.951	-, 0.11	3.74	0.48	0.922	-, 013

Source: Own Research, 2019.
SD - Standard Deviation; CC - Correlation Coefficient.

Studies have shown that lifestyle is one of the most important risk factors for NCDs, and we can group BMI together with intake unhealthy food, physical inactivity and alcohol and tobacco abuse (GBD, 2016; Markussen, 2016; Stringhini, 2018). The correlations showed that the increase in the prevalence of obesity in Brazil, reinforcing the hypothesis of the increase in the number of obese in the population currently studied in both sexes. In addition, a higher BMI and a higher number of obese individuals are observed among individuals with some degree of glycemic homeostasis abnormality (diabetes or altered fasting glucose) (Silva, 2018). The nutritional panorama of Brazilians stands out for the high prevalence of overweight in the adult population, resulting in a higher frequency of this nutritional disorder in the elderly, contributing to alteration of morbidity and mortality profile in this group.(Marucci, 2019). In Brazil, estimates of obesity prevalence according to the Telephone Factors Surveillance Risk and Protection Factors Surveillance System (VIGITEL) (Brazil, 2017) increased from 15 to 18% from 2010 to 2014, in both countries. sexes (Ferreira, 2019). There is a predisposition to higher calorie diets in the last three decades, as well as significant increases in carbohydrate intake, along with increased saturated fat intake, which may increase the risk of chronic diseases by acting on pro-inflammatory mechanisms, decrease insulin sensitivity, increased blood pressure and endothelial dysfunction (Jacomini, 2018; Wong, 2018).

The results presented by the BRAZOS study (The Brazilian Osteoporosis Study) show that 76% of the Brazilian population over 40 years old presents inadequate micronutrient and macronutrient consumption (Venturini, 2015). On the otherhand, carbohydrate-lowering diets with low glycemic index also show significant improvement in fasting glucose, fasting insulin, hemoglobin A1c and weight loss, when compared to a normoglycemic diet (Schuster, 2015; Vega-López, 2018). Scientific studies show that changes in lifestyle and eating habits can strongly influence several risk factors (Dias, 2016; Wang, 2018;Schulze, 2018). These modifications include educating the population about their diet, showing that better dietary choices can make all the difference in their health (Wang, 2018). Improvements in eating behavior result in easier energy control, body fat and adequate weight, in addition to lowering blood pressure, improving glucose metabolism, among other benefits (Jung, 2018). The role of diet in the etiology of most NCDs is extremely important, and it has been shown in the literature that, in fact, diets with a specific nutrient deficit and excess contribute to the development of NCDs and that appropriate dietary changes may reduce the risk of these diseases (Olguin, 2018).

Final Considerations

In this context, data on food consumption and biochemical tests are extremely important in the assessment and evolution of individuals, as they directly assist in the investigation and monitoring of changes presented by the patient and the most appropriate treatment. Showing that changes in the composition of dietary macronutrients help control and improve blood glucose. Therefore, maintaining a proper and balanced diet helps in reducing circulating glucose and insulin levels, being very important for maintaining a metabolic control. As the population ages, more research is needed on nutritional needs and health outcomes, and public health efforts are needed to increase physical activity and food intake among older people.

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