

STANDARD OF PHYSICAL ACTIVITY AND INFLUENCE OF SEDENTARISM IN THE OCCURRENCE OF DYSLIPIDEMIAS IN ADULTS

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ABSTRACT

Introduction: Physical activity is becoming an increasingly important mean to prevent, and even treat certain diseases that affect modern societies. The purpose of this study was to verify the pattern of physical activity and the association between physical inactivity and the presence of dyslipidemias in adults. **Materials and Methods:** This is a sectional designed study based on epidemiological and analytical approach. Participated in the sample 43 individuals assisted by a social health program in the city of Santa Rita (PB), being 7 men (50.4 ± 14.6 years) and 36 women (55.4 ± 13.5 years). The study variables included socio-demographic and anthropometric data. For the classification of physical activity was used the IPAQ short version, the ratings of lipoproteins took place through standardized blood exams tested in the laboratory. **Results:** 20.9% are affected by isolate hypercholesterolemia, 17.9% isolate hypertriglyceridemia, 23.5% mixed hyperlipidemia, 25.6% decreased HDL-C associated with high LDL-C or high triglyceride. For the practice of physical activity, 14.0% are sedentary, 67.4% insufficiently active, 16.3% active and 2.3% very active. When grouped together, less active and sedentary individuals had 1.5 times more chance of being dyslipidemic (IC95%: 0.7-7.4) in relation for active and very active. **Discussion:** The presence of imbalance in lipid metabolism was clear and worrying. The pattern of physical activity display the majority as insufficiently active, and sedentary appeared as a determining factor for the occurrence of dyslipidemias. Porting, considering the highlighted and discussed results in this study, more active individuals seem more protected to the metabolic imbalance. Nevertheless, prospective studies are needed to better assess the role of improvement of metabolic profile by non-pharmacological measures with adherence to programs of physical exercise or increase in physical activities with higher energy expenditure, besides the attention to the diet control.

KEYWORDS

Dyslipidemias, Motor Activity, Metabolism.

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PADRÃO DE ATIVIDADE FÍSICA E INFLUÊNCIA DO SEDENTARISMO NA OCORRÊNCIA DE DISLIPIDEMIAS EM ADULTOS

RESUMO

Introdução: A atividade física está se tornando um meio cada vez mais importante para prevenir, e até mesmo tratar, determinadas doenças que acometem as sociedades modernas. O objetivo deste estudo foi verificar o padrão de atividade física e a associação entre o sedentarismo e a presença de dislipidemias em adultos. **Materiais e Métodos:** Trata-se de um estudo com desenho seccional em base epidemiológica e abordagem analítica. Participaram da amostra 43 assistidos de um programa social de assistência à saúde, no município de Santa Rita (PB), sendo 7 homens (50,4±14,6 anos) e 36 mulheres (55,4±13,5 anos). As variáveis de estudo incluíram dados sócio-demográficos e antropométricos. Para a classificação da atividade física, utilizou-se o IPAQ versão curta. As avaliações das lipoproteínas realizaram-se por meio de exames sanguíneos padronizados e analisados em laboratório. **Resultados:** 20,9% são acometidos por hipercolesterolemia isolada, 17,9% hipertrigliceridemia isolada, 23,5% hiperlipidemia mista, 25,6% HDL-C diminuído associado ao LDL-C elevado ou triglicérideo elevado. Quanto à prática de atividade física, foi visto que 14,0% são sedentários, 67,4% insuficientemente ativos, 16,3% ativos e 2,3% muito ativos. Quando agrupados, os indivíduos pouco ativos e sedentários apresentaram 1,5 vezes maior chance de serem dislipidêmicos (IC95%: 0,7-7,4) em relação aos ativos e muito ativos. **Discussão:** A presença de desequilíbrio no metabolismo lipídico foi evidente e preocupante. O padrão de atividade física enquadrou a maioria como insuficientemente ativo e o sedentarismo apareceu como um fator determinante para a ocorrência de dislipidemias. Portanto, considerando os resultados evidenciados e discutidos neste estudo, indivíduos mais ativos parecem estar mais protegidos quanto ao desequilíbrio metabólico. Não obstante, estudos prospectivos são necessários para avaliar melhor o papel da melhora do perfil metabólico por medidas não-farmacológicas, com a adesão a programas de exercícios físicos ou incremento de atividades físicas com maior gasto energético, além da atenção ao controle dietético.

PALAVRAS-CHAVE

Dislipidemias, Atividade Motora, Metabolismo.

NIVEL DE ACTIVIDAD FÍSICA E INFLUENCIA DEL SEDENTARISMO EN EL APARECIMIENTO DE DISLIPIDEMIAS EN ADULTOS

RESUMEN

Introducción: La actividad física se está volviendo un medio cada vez más importante para prevenir e incluso tratar determinadas enfermedades que afectan a las sociedades modernas. El objetivo de este estudio fue verificar el nivel de actividad física y la asociación entre sedentarismo y la presencia de dislipidemia en adultos. **Materiales y Métodos:** Se trata de un estudio con diseño transversal de base epidemiológica y abordaje analítico. Participaron en la muestra 43 atendidos en un programa social de asistencia a la salud en el municipio de Santa Rita (PB), siendo 7 hombres (50,4±14,6 años) y 36 mujeres (55,4±13,5 años). Las variables de estudio incluyeron datos sociodemográficos y antropométricos. Para la clasificación de actividad física se utilizó el IPAQ versión corta; la evaluación de las lipoproteínas se realizó por medio de exámenes sanguíneos estandarizados en laboratorio. **Resultados:** 20,9% estaban afectados por hipercolesterolemia aislada, 17,9% hipertrigliceridemia aislada, 23,5% hiperlipidemia mixta, 25,6% HDL-C disminuido asociado a LDL-C elevado o triglicéridos elevados. En cuanto a la práctica de actividad física se observó que, 14,0% eran sedentarios, 67,4% insuficientemente activos, 16,3% activos e 2,3% muy activos. Al ser agrupados, los individuos poco activos y sedentarios presentaron 1,5 veces más oportunidad de ser dislipidémicos (IC95%: 0,7-7,4) en relación a los activos y muy activos. **Discusión:** la presencia de desequilibrio en el metabolismo de los lípidos fue evidente y preocupante. El nivel de actividad física enmarcó a la mayoría como insuficientemente activos y el sedentarismo apareció como un factor determinante para el apareamiento de dislipidemias. Por tanto, considerando los resultados manifestados y discutidos en este estudio, individuos más activos parecen estar más protegidos en cuanto al desequilibrio metabólico. No obstante, son necesarios estudios prospectivos para evaluar el papel de la mejora del perfil metabólico por medidas no farmacológicas con la adhesión a programas de ejercicios físicos o incremento de la actividad física con mayor gasto energético, además de la atención al control dietético.

PALABRAS CLAVE

Dislipidemias, Actividad Motora, Metabolismo.

INTRODUCTION

The definition of the physical activity standard of populations is of utmost importance to establish its relation with the process "health and illness", as well as to define the energetic necessities of the individuals. However, it is necessary to know the quantity of activity that must be performed for the maintenance of health and more information about standards and energetic cost of different activities for all ages and both sexes.

In Brazil, there is a lack of study and information about the physical activity standard of the population. Until now, there are no domiciliary based researches of national amplitude that have investigated, in details, leisure, transport or domestic activities. This way, to know the level of physical activity of the population is relevant, especially to find out if individuals are performing enough activities which reflect in benefits to the health, besides giving useful

information for the development of promotional health programs related to changes in life style.

Recently, some international institutions of health^{1,2} are emphasizing that the so called "non-transmissible chronic diseases" (NTCD) would have been one of the biggest problems of public health in the main countries of the world. Also, diverse chronic damage has being referenced in the Brazilian population³, being spread either among those with a strong power of acquisition, or the lower classes, with a lower power of acquisition, according to their social and economic levels.

Amongst the main NTCD, there are the dyslipidemias that appear as a fundamental cause for the development of atherosclerotic coronary diseases⁴.

The prevention of these morbidities and risk factors, that is presented as a determinant or associated to these abnormalities, has increased considerably the hope of life of population groups in productive stage, especially in developed countries, where many researches on epidemiology has been done, through longitudinal and transversal studies, followed by the application of interventional programs^{5,6}.

Back to reverencing the potential promoted by the practice of physical activity, it is believed that the knowledge of its standard in Brazilian contingent is extremely important to establish its relation with the health status of the population.

In this sense, it was chosen to accomplish the present epidemiological study, focusing on the determination of the physical activity standard and the association between the sedentarism and the presence of dyslipidemias in adults assisted in a social program of health assistance.

MATERIALS AND METHODS

Ethics commission

This study was approved, under the number 001/2008, by the Ethics Commission of the Instituto Felipe Kumamoto of Medical Research and Health Assistance, together with the Hospital Memorial de São Francisco - João Pessoa - Paraíba - Brazil.

Research characterization

This study presents a sectional drawing with epidemiological basis which includes an analytical approach for the verification of associations between categorized variables.

Sample

Participants: 43 individuals, 7 men (50.4 ± 14.6 years old) and 36 women (55.4 ± 13.5 years old). The place of the data collection was a private clinic located

in the Santa Rita city (PB) and the sampling process was nonprobabilistic, counting on the individuals which were present at the moment of the research's accomplishment, who voluntarily accepted to participate.

Variables and instruments used in the study

The variables established for the investigation were: practice of physical activity and the biochemical markers which characterize the dyslipidemias.

Practice of physical activity

To determine the physical activity standard we used the International Questionnaire of Physical Activity (IPAQ) in its short version, validated in Brazil by the Centro de Estudos do Laboratório de Aptidão Física de São Caetano do Sul⁷. This instrument is composed by six questions related to the frequency and duration of the accomplishment of moderate, vigorous physical activities and walking that a

Table 1 - Characterization of the sample in relation to sex, social class, color of the skin, presence of dyslipidemias and practice of physical activity (n=43)

studied variables	n	%
sex		
male	7	16.3
female	36	83.7
social class		
A - B	-	-
C	9	20.9
D	32	74.4
E	2	4.7
color of skin		
white	1	2.3
black	6	14.0
brown	36	83.7
presence of dyslipidemias		
isolated hypercholesterolemia	9	20.9
isolated hypertriglyceridemia	7	17.9
mixed hyperlipidemia	10	23.5
↓ HDL-C associated to ↑ LDL-C or triglyceride	11	25.6
physical activity practice		
very active	1	2.3
active	7	16.3
insufficiently active	29	67.4
sedentary	6	14.0

person accomplished in the previous week. The questionnaire was applied in the presence of the researchers who explained the procedures in full details for the fulfilling of the instrument. The citizens were classified in: sedentary, insufficiently active (little active), active and very active.

Biochemists markers

The total of cholesterol (CT), the cholesterol of high density (HDL-C), the cholesterol of low density (LDL-C) and triglyceride (TG) were analyzed through the venous blood collection from the fold of the elbow, after a period of 10h to 12h of fast, between 7:30 a.m. and 8:30 a.m. The serum was separated by centrifugation, having determined the proportion of TG, CT, HDL-C and LDL-C by processed kits in an enzymatic analyzer.

The present research considered, as reference, the values proposed by the IV Brazilian Guideline for Dyslipidemia and Atherosclerosis prevention: Department of Atherosclerosis of Brazilian Society of Cardiology, in Portuguese: IV Diretriz Brasileira sobre Dislipidemias e Prevenção da Aterosclerose do Departamento de Aterosclerose da Sociedade Brasileira de Cardiologia⁸. The classification of the dyslipidemias comprehended four well definite situations:

1. Isolated hypercholesterolemia (isolated increasing of LDL-C > 160mg.dL⁻¹).
2. Isolated hypertriglyceridemia (isolated increasing of TG > 150mg.dL⁻¹)
3. Mixed hyperlipidemia (increased values of LDL-C > 160mg.dL⁻¹ and TG > 150mg.dL⁻¹).
4. Reduction (↓) isolated of HDL-C: reduction of HDL-C (men < 40mg.dL⁻¹ and women < 50mg.dL⁻¹) or in association with the increasing (↑) LDL-C and/or of TG)

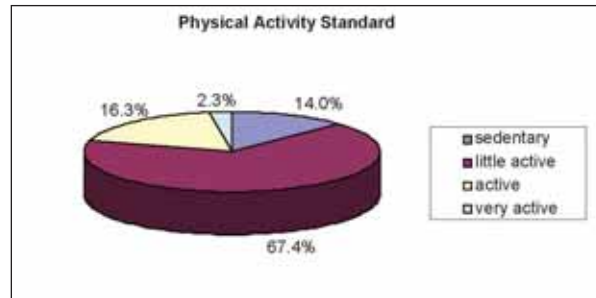
Procedures for data collection

Table 2 - Distribution of mean and standard deviation of the anthropometric and biochemical variables divided by sex (n=43)

variables	male (n=7)	female (n=36)	P value
age (years old)	50.4 ± 14.6	55.4 ± 13.5	0.384
body mass (kg)	73.2 ± 17.2	66.9 ± 13.4	0.288
height (m)	1.65 ± 0.08	1.51 ± 0.06	0.000*
CC (cm)	92.8 ± 13.4	88.8 ± 12.4	0.455
CT (mg.dL ⁻¹)	161.8 ± 41.9	211.3 ± 40.3	0.002*
HDL-C (mg.dL ⁻¹)	52.0 ± 12.1	49.2 ± 6.1	0.360
LDL-C (mg.dL ⁻¹)	82.6 ± 29.5	128.7 ± 40.3	0.005*
TG (mg.dL ⁻¹)	99.0 ± 44.9	161.2 ± 65.6	0.001*

*p < 0.05 (significant)

Figure 1 - Distribution of frequency of the physical activity standard (n=43)



Initially, the election and training of field agents' team was accomplished for the data collection, which counted on the support of the Instituto Felipe Kumamoto de Pesquisas Médicas e Assistência à Saúde, by means of concession of the instruments, physical structure and production of the questionnaires. In the sequence, the following steps were followed: a) Contact with the Health Secretariat of the city chosen to the accomplishment of the study, where they were informed about the objectives of the research; b) After the authorization, notification and consciousness-raising of the community about the participation of the research, interviews were performed and the analyzes of indicators of health were previously defined for investigation. The individuals were informed of the procedures, the risk and the benefits of the study before signing an Informed Consent accepting to participate voluntarily in the research, according to the law 196/96 of the National Council of Health⁹.

Data analysis

The analytical plan processed the descriptive data of percentages, average, minimum, maximum, standard deviation and inferential analysis by using the Odds Ratio (OR) for the reason of the products crossed between the sedentarism (independent variable) categorized (sedentary + little active)

Table 3 - Association between the physical activity practice (independent variable) and the dyslipidemia in adults of both sexes (pay off).

physical activity	dyslipidemia		OR*(IC95%)
	absent	present	
sedentary / little active	23	10	1.5 (0.7-7.4)
active / very active	06	04	
total	29	14	43

OR: Odds reason (measure of association between the categorical variables)

and the presence of dyslipidemia (pay off). It was adopted a reliable interval of 95%. For such procedures, it was used the SPSS in its version Windows 16.0.

RESULTS

With the intention of characterizing the participants of this study, we have chosen to identify, descriptively, the social-demographic variables, predominance in the color of skin, prevalence of dyslipidemias and classification of the physical activity practice (Table 1).

In Table 2 there are the anthropometric and biochemical data compared by sex. From the statistic point of view, men are higher ($p=0.001$) and present inferior plasmatic levels of LDL-C ($p=0.005$) in relation to their female pairs.

In Figure 1, we can see the distribution of frequency of the physical activity practice with detach for the high prevalence of physical inactivity, when combined the categories active (67.4%) and sedentary (14.0%).

When we analyzed the association between the physical activity standard and the presence of dyslipidemias, according to Table 3, it was observed that sedentary individuals or individuals with insufficient practice of physical activity present 1.5 times more possibilities to be fit as dyslipidemic (OR=1.5; IC95%: 0.7-7.4) in relation to their more physically active pairs.

DISCUSSION

This study is part of a project in a wider populational level which will trace, in the next four years, the cardiovascular diseases and their associated factors in the population of Paraiba City, named "Scientific Project Itinerant Health". This epidemiological segment is interested in serving as a tool for diagnosis, prevention and control of cardiological diseases which are important for the public health in the State of Paraiba. The present work deals, specifically, with the determination of the physical activity standard, clarifying the relation between the sedentarism and the presence of dyslipidemias in adults.

The physical activity is becoming, more and more, an important way to prevent, and even treat certain diseases

that afflict modern societies. In this perspective, the maintenance of an active life style reduces, substantially, the risk of having some pathologies and improves the quality of life in all age groups¹⁰.

The physical activity standard fitted 12.8% of the participants of the sample as little sedentary. When we see sedentarism combined to the little active, the prevalence increased to 78.5%. Researches about the measure of physical activity are still little frequent in populations of the Northeast of Brazil, a condition that makes difficult to compare the findings in this work. However, analyzing the prevalence which has been already found in other regions of the country, it is noticed that our data about the physical inactivity (sedentary and little active people) are high, compared to the frequencies of sedentarism published by Siqueira *et al.*¹¹, in which local people were analyzed in areas with basic health units in their amplitude, in cities in the South region and Northeast and they found 31.8% and 58.0% of sedentarism in adults and elderly people, respectively. Masson *et al.*¹² who counted on a sample of women-based population of São Leopoldo (RS), could see, in their results, that 37.0% were affected by low practice of physical activity, situation which is also inferior to the data of Santa Rita City (PB).

Regarding the dyslipidemias, it is known that, conceptually, it is the condition in which there is an abnormal concentration of lipids or lipoproteins in the blood, becoming an important risk factor for the development of atherosclerosis complications. The correlations between the risk for coronary artery disease and high seric concentrations of total cholesterol (CT) are well established in different populations, mainly lipoprotein of low density (LDL-C), as well as reduced concentrations of high density lipoprotein (HDL-C)^{13,14}.

The frequency of dyslipidemias among the ones who were investigated was evident and worrying. The physical activity standard fitted the majority of them as insufficiently active and the sedentarism came along as a determinant factor for such occurrence.

Romaldini *et al.*¹⁵, studying a younger age-group, objected to analyze the prevalence of dyslipidemias and the association with determinants for atherosclerosis; among the factors, the relation with the physical activity

was analyzed. The authors found out in their results that 72.5% of the people affected by dyslipidemia did not practice any physical activity, ratifying that the sedentarism can facilitate the appearance of low concentrations of HDL-C and increase the triglycerides. The importance of studying the relation between physical activity and lipoprotein indicators and the association with other physiological and metabolic conditions has been cited in researches with epidemiological methods^{16,17}.

One of the limitations of this study was, admittedly, the sample number, condition attributed to the difficulty of grouping eligible people in epidemiological researches. Despite this fact, regarding the methodological severity presented, the evidenced data present a tendency that can be referenced in other studies of this nature.

Therefore, considering the results evidenced and discussed in this study, more active individuals seem to be more protected against the metabolic disequilibrium. Not so far, prospective studies are necessary to better evaluate the role of the improvement of the metabolic profile for non-pharmacologic measures with the adherence of physical exercises programs or increment of physical activities with a bigger energetic waste, besides the attention to the dietary control.

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