

Programs of Active Aging – A Relation between BMI and Triglycerides

*Programas de Envelhecimento Ativo - A relação entre
IMC e Triglicérides*

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ABSTRACT: Objective: To enhance the importance of physical activity programs for elderly and their influence on BMI and triglycerides. Methods: The sample consisted of 91 elderly individuals, 63 females and 28 males aged between 65 and 78 years of age. All seniors practice water activities, including swimming and gymnastics. Were analyzed with respect to two aspects: BMI, Triglycerides and practice time, seniors who were physically active at least 2 months, and seniors who maintained habits of physical activity between 2 and 6 months and still accumulated 30 or more minutes of other activities. We have established contingency tables were confronted where the variables described in the analysis. Results: It was found that elderly who maintained physical activity programs were broader outnumbered those who were overweight and obesity rates in Table I of BMI, and lower triglycerides values. Conclusions: We concluded therefore that physical activity programs that contemplate 2 or more hours per week, duly organized and systematized constitute a positive factor in combating inactivity and turn into a more active and cheerful elderly.

Keywords: Physical Activity; BMI; Triglycerides.

RESUMO: *Objetivo: Aumentar a importância de programas de atividade física para idosos e sua influência sobre o IMC e triglicérides. Métodos: A amostra foi composta por 91 idosos, 63 do sexo feminino e 28 do sexo masculino com idade entre 65 e 78 anos de idade. Todos os idosos praticam atividades aquáticas, como natação e ginástica. Foram analisados com relação a dois aspectos: IMC, triglicérides e tempo de prática, idosos que eram fisicamente ativos, pelo menos há 2 meses, e idosos que mantiveram os hábitos de atividade física entre 2 e 6 meses e ainda acumularam 30 minutos ou mais de outras atividades. Estabelecemos tabelas de contingência, que foram confrontadas com as variáveis descritas na análise. Resultados: Observou-se que idosos que mantêm programas de atividade física apresentavam menor desvantagem manifesta em taxas de sobrepeso e obesidade no quadro I do IMC; e valores de triglicérides mais baixos. Conclusões: Conclui-se, portanto, que programas de atividade física que contemplam 2 ou mais horas por semana, devidamente organizados e sistematizados constituem um fator positivo no combate ao sedentarismo, podendo transformar a pessoa em um idoso mais ativo e alegre.*

Palavras-chave: *Atividade Física; IMC; Triglicérides.*

Introduction

Aging is one of the most visible phenomena in contemporary societies and like any other, cannot be ignored. Aging can vary from individual to individual, being gradual for some and faster for others. These variations are dependent on factors such as lifestyle, socioeconomic conditions and chronic diseases. Some characterize aging as a general decline in daily living skills, others consider it as a period of increased vulnerability and increasing dependence in the family. Still others venerate old age as the highest point of wisdom, common sense and serenity (Twisk, 2000).

In the daily routine of elderly, exercise is a paramount importance, the most suitable for the elders to maintain healthy and independence are working to "strength, balance, flexibility and endurance, exercise should be done regularly, and should not be

strenuous in order to not damage any organs such as the heart" (Quality Health Care for the Elderly, 1995. *In*: Nunes, 2009, p.12).

In the old routine exercise is of paramount importance, the most suitable to the elders to keep them healthy and independents are working strength, balance, flexibility and endurance, the exercise should be done regularly, and should not be strenuous in order not damage any organ such as the heart, and Oliveira Sampaio (2012).

Exercise for seniors should consider the three most important types of training for this specific population, so it is recommended: flexibility training / balance, strength training and endurance training / aerobic. As can be noted, that when establishing an exercise program should also be taken into account age, gender, medical condition, the level of physical activity of the wearer and objectives of this. The determination of these factors can contribute to choose a type of exercise over another, for example, the initial intensity of exercise to sedentary elderly should be lower than that applied to individual athletes, so there is a more gradual progression (Pollok, 2011 & Pinto, 2007).

Literature

Changes in levels of functional fitness are provided by the specificity of exercise and its intensity. For this, we need careful assessment of the physical conditions in which they are seniors and also the objectives to be achieved. Highlights the importance of individualized exercise programs and the use of literature available basis to maximize safety and effectiveness in the programs to the population over sixty years.

The relationship between physical activity, aging and health has been the subject of a growing interest of many researchers and gerontologists. PA programs for this age group are essential for presenting a set of benefits at physiological, social and psychological, to improve the well-being and quality of life of the subject. These programs are increasingly an option right, and more and more fans (Cardoso, 2002).

Sardinha (2009) argues that physical activity plays an important role in promoting selective changes in body composition, and metabolic fitness in physical fitness, meaning, the rate of degenerative process can be altered by physical activity.

The practice of AF, especially in the elderly, when performed systematically produces many benefits, such as increased life expectancy (longevity), reduces the rates of morbidity and mortality, prevents cognitive decline, maintain or improve functional capacity, reduces the frequency of falls and fractures, promotes independence and autonomy, improves self-esteem and image that the subject makes himself (psychological benefits) (Mazo *et al.*, 2010).

The participation in regular exercise, it is assumed as an effective means to reduce / prevent some of the declines associated with age, highlighting the strength training that helps to counteract the loss of muscle mass and strength, (Lamas, 2008). Additional benefits are improved health of osteo-articular and reducing the risk of osteoporosis, improve postural stability, which means less risk of falls, and improved flexibility. Together, these adaptations to training significantly increase the functional capacity of the elderly, as well as improving the quality of life of these populations (Matsudo, 2004).

It is therefore necessary to keep the elderly active and live a quality life stage which inevitably has its own characteristics, even considering the possibility of the presence of disease.

Without losing the notion that individuals of the same age and may differ in their physiological condition and response to stimulation caused by exercise, realizing that while aging is an inevitable process, or the rate at which this process occurs, whether its potential reversibility may be amenable to intervention.

The level of intensity depends on each individual, and is more suitable for seniors opt to exercise of low to moderate intensity, adapting to each of these in order to maintain interest in exercise performs, prevent injuries on use and prevent the occurrence of cardiovascular complications. To this must be taken into account parameters such as maximal oxygen consumption, heart rate or classification perception of effort (Nunes, 2009).

The appropriate physical assessment, intensity, duration, frequency and progression of physical activity are essential components of a systematic and individualized prescription of exercise. These five components are used in the prescription of exercise for people of all ages and functional abilities, regardless of the existence of risk factors or diseases Kostka (2009).

However, exercise prescription should be developed based on the individual's health condition, the risk factor profile, behavioral characteristics, personal goals and exercise preferences.

The objectives of the exercise prescription should take into account several factors, among which highlight a better physical fitness of the individual, promotion and health needs, reducing risk factors for chronic diseases and care to have while participating in exercises, given to their clinical condition (Moreira, 2005). However, in addition to aspects related aspects of health of every citizen, individual interests are also important when prescribing an exercise program.

The general principles of exercise prescription apply to all stages of life, including the elderly. However, precautions to take during this same limitation must be due to the wide variation in the levels of health and physical fitness of elderly.

Triglycerides

Studies have shown that high levels of triglycerides (TGC), represent a risk factor for cardiac events in elderly individuals of both sexes (Oliveira Sampaio, 2012).

Hypertriglyceridemia and hypercholesterolemia represent a risk factor for myocardial infarction and arterial disease in older individuals. An increase in LDL is also a high risk for atherosclerosis and dementia, in this segment of the population and (Oliveira Sampaio, 2012).

In addition to the HDL and LDL, Triglycerides values have to be considered. However, the effects of the latter have not been fully established (Twisk, 2000). The triglycerides form the majority of fats and are essential for a normal functioning of the body, but may be elevated in the blood due to excess weight by drinking alcohol, diabetes or hereditary disease (Mota *et al.*, 2003).

The endocrine Triglycerides "represent the most important source of energy in the body and is present not only in adipose tissue but also in skeletal muscle and plasma" (Moreira & Sardinha, 2003, p. 4).

However, these cannot be identified as an independent risk factor, because of the large number of variables associated with elevated triglycerides such as obesity, physical

inactivity, smoking, excessive alcohol, excess carbohydrates, type 2 diabetes and genetic factors (Assmann *et al.*, 1998).

Here we represent the table of triglycerides recommended by the Third Joint Task Force of European and other Societies on Cardiovascular Disease Prevention in Clinical Practice (De Backer *et al.* 2003).

Table 1 - Classification of CVD risk in adults, based on the amounts of triglycerides, Backer *et al.* (2003)

LÍPID		CONCENTRATION (mg/dl)	CLASSIFICATION
Cholesterol (CT)	Total	< 190	Desirable
		> 320	High risk
Triglycerídes (TG)		< 150	Desirable
		≥ 150	High risk

According to Kostka (2009) and Dantas (2003), is defended great importance to establish the effects of physical activity in older populations, as well as the intensities and durations to obtain beneficial results in terms of prevention of cardiovascular diseases. Noteworthy is the aerobic workout that helps prevent or delay the development of hypertension, and increase the ability to perform ADLs (activities of daily living) improving cardiovascular capacity.

The sport for these populations also has a role that goes beyond the aspects related to health, in seeking to achieve this important goal sócio-cultural (Kalapotharakos, 2007).

Although exercise should, at any age, be adapted to who will practice, this rule is critical when there is osteoporosis and / or fractures, adequate supervision is necessary to avoid efforts that may cause fracture, particularly vertebral.

Marching is the physical activity with more impact and is recommended by not requiring special skills.

However there are still doubts on its ability to produce effect on bone remodeling process.

Swimming or water aerobics are usually activities chosen by the elderly and although they may be good strengthening exercises, especially the posterior region, are not the most suitable in cases of osteoporosis because it does not put pressure required for bone development (Matsudo, 2004). Functional training with resistance does not mean an improvement in BMD in all older people but has a key role in reducing the risk and fear of falling. The performance of Postural exercises is one way to improve posture and strengthen the dorsal, lumbar and abdominal muscles.

Methods

Sample Selection

The sample were 91 subjects (63 female and 28 male), aged between 65 and 78 years. All practicing swimming and gymnastics were analyzed in relation to BMI, Triglycerides and practice time (seniors who were physically active less than three months, and the elderly who held habits of physical activity between 2 and 6 months, and still accumulating 30 minutes or more other types of activities). The elderly group was assessed on two occasions: at the beginning of the season (January) and at the end of the season (early December).

Definition of variables

We defined as dependent variables: BMI and values of triglycerides. These variables were established and compared the differences between them, making sure that there would be significant changes. To determine the latter aspect was defined as the independent variable physical activity performed regularly during the week and throughout this period.

Instruments and procedures

First we have measured the weight and height of each individual to implement in them the BMI formula.

For weight will use a portable digital scale with appropriate adjustment where we observed the weight indicated on the display and we recorded it in an informatics file. Was then measured subjects' height with regular anthropometer.

For the records of the triglycerides values was used the Accutrend Plus device and test strips from Roche, following the instructions in the instruction manual of the same. The collection was performed at the end of each lesson that individuals performed.

Data Analysis

For the treatment and analysis of the data was used the program "Statistical Package for Social Sciences - SPSS", version 17.0 for Windows. Initially we used descriptive statistics in order to describe and characterize the sample. Subsequently defined contingency tables (evaluation by stratum BMI), and even non-parametric tests of comparison intergroup and intragroup (Wilcoxon, Mann-Whitney & Kruskal-Wallis).

Results

We will present the results obtained after a statistical analysis of the variables involved in the study.

Table 2 - List of the last 3 months that records the physical activity 3 times a week

			BMI Stratification				
			Normal weight 18,5 < 24,9	Overweight 25 < 29,9	Obesity I 30 < 34,9	Obesity II 35 < 39,9	Total
In the last three months to record physical activity 3 times per week	No	N	27	30	11	3	71
		% Total	29,7%	33,0%	12,1%	3,3%	78,0 %
	Yes	N	7	9	2	2	20
		% Total	7,7%	9,9%	2,2%	2,2%	22,0 %
Total		N	34	39	13	5	91
		% Total	37,4%	42,9%	14,3%	5,5%	100,0 %

We checked, by the stratum BMI greater tendency to overweight and obese Type I and II in the group that does not record the last 3 months practice 3 times per week. It appears this same variance in the study of the (Cross, 2011) where individuals with less practice time had levels considered obese.

Table 3 - accumulates 30 or more minutes of physical activity 5 or more days during the week

			BMI Stratification				Total
			Normal weight 18,5 < 24,9	Overweight 25 < 29,9	Obesity I 30 < 34,9	Obesity II 35 < 39,9	
Accumulates 30 or more minutes of physical activity 5 or more days during the week	No	N	18	19	8	2	47
		% Total	19,8%	20,9%	8,8%	2,2%	51,6 %
	Yes	N	16	20	5	3	44
		% Total	17,6%	22,0%	5,5%	3,3%	48,4%
Total		N	34	39	13	5	91
		% Total	37,4%	42,9%	14,3%	5,5%	100 %

If we focus on the group that accumulate 30 minutes of physical activity on 5 or more days of the week, there are, except for the level of "Normal Weight" values most favorable to the group that fulfills this requirement. According to this stratification of BMI observed advantages in the group that meets 30 minutes of exercise five or more days per week in the heights of "obesities I and II" (Sardinha, 1999; Santos, 2002; Santiago, 2006).

Table 4 – BMI stratification related Triglycerides

			Triglycerides		Total
			No < 150	Yes > 150	
	Normal weight	N	24	10	34
	18,5 < 24,9	% Total	26,4%	11,0%	37,4 %
BMI stratification	Overweight 25 < 29,9	N	22	17	39
		% Total	24,2%	18,7%	42,9%
	Obesity I 30 < 34,9	N	8	5	13
		% Total	8,8%	5,5%	14,3%
	Obesity II 35 < 39,9	N	1	4	5
		% Total	1,1%	4,4%	5,5%
	Total	N	55	36	91
		% Total	60,4%	39,6%	100 %

We observed from table 4 that within the BMI stratum, higher values indicate percentages of triglycerides below 150, considered as satisfactory, defined in the same way by (Lakatta, 2003).

Conclusions

Considering the results presented and discussed above could deduce that the initial goals were achieved.

It appears therefore that physical activity programs that contemplate 3 or more hours per week, duly systematized and organized are a positive factor in combating inactivity and turn in an elderly person more active and cheerful.

They also feature an important factor in the regulation and / or a decrease in levels of triglycerides, as well as their body types, or BMI. Triglycerides are fat molecules, whose main function is to produce energy for the body, but its excess is also associated with cardiovascular damage. Most of the elderly had desirable levels, lower percentage found in the elderly with programs of physical activity.

These data show that a physical experience in everyday routine practice has a favorable influence on health in individuals of any age or sex. Despite reductions in functional capacity and exercise performance, even among active individuals, regular exercise can counterbalance the typical effects of aging (Pollock, 2007). The practice of a non-sedentary routine is very preventive in these types of diseases.

It was observed that the elderly group is not, eventually, predisposed to develop metabolic and cardiovascular disorders, because the results do not showed the occurrence risk factors in these individuals. These data demonstrate the importance of implementing preventive measures and control of these risk factors to prevent the development of atherosclerotic diseases and vascular, and thus provide a better quality of life for the population studied.

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