93 - BODY COMPOSITION AND CHOLESTEROL OF INDIVIDUALS PANIC DISORDER: RESPONSE TO THE AN AEROBIC PHYSICAL TRAINING

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INTRODUCTION

Panic is one of the pathological conditions of anxiety, and is characterized by sudden episodes of terror, followed by intense autonomic manifestations. These manifestations involve both somatic and cognitive aspects such as palpitation, tremor, sweating, dizziness, nausea or abdominal discomfort, difficulty to breathe, sensation of discomfort or pain in the chest, fear of going insane or losing control, fear of agonizing, fear of death, etc. The attacks reach a peak quickly (10 minutes or less) and are followed, for at least a month, by a persistent fear of another attack, excessive concern about the organic alterations the patient perceives, as an increase in the heart beat or sweating, as well as concern about the possible consequences of a next attack or of significant behavioral changes [1,2].

Panic disorder might take place with or without agoraphobia, characterized by the fear or concern the individual experiences at being in places from where it might be difficult to escape or receive help in the event of a panic attack. Therefore, those patients usually avoid public places, leaving home unaccompanied or traveling, and even situations that might suddenly alter some physiological responses, such as an increase in the heart rate, blood pressure and levels of blood lactate. As a result, they have difficulty to perform routine tasks related to their personal and professional lives. Consequently, their general physical fitness is impaired when compared to healthy individuals [3,4,5].

The decrease of the overall physical fitness is related to the risk of coronary and metabolic diseases such as coronariopathies, obesity and dyslipidemia. Therefore, the patients with panic disorder might be exposed to health problems other than the panic itself as a result of their decreased physical fitness[6,7].

The objective of the present study was to evaluate the physiological responses in the body composition and seric levels of cholesterol of individuals with panic disorder, after an aerobic physical training.

METHODS

27 individuals with ages ranging from 30 to 50 years participated in the study. They had a diagnosis of panic disorder, with or without agoraphobia, according to the DSM-IV[1] criteria. A psychiatrist of the Department of Psychobiology of the Federal University of São Paulo, UNIFESP-Brazil carried out a structured clinical interview with the subjects. The Committee of Ethics in Research with Humans of UNIFESP approved the protocols (registration number 992/00).

The exclusion criteria were: pregnant women, women who were breastfeeding, psychiatric history or diagnoses of disorders other than panic (psychotic symptoms, bulimia, nervous anorexia, neurological problems, drug dependence) and a regular practice of physical exercise similar to that in the program. The volunteers were randomly assigned to two groups: training group (TG) and control group (CG). After the exercise protocol had been explained, the volunteers provided written informed consent, filled out a form with personal and socio-demographic data and answered the International Physical Activity Questionnaire-short [8]. We then ran blood tests to evaluate their total cholesterol, HDL (high density lipoprotein), LDL (low density lipoprotein) and triglycerides, and took the measurements of their body composition (body mass, percentage of fat and percentage of free fat mass) by means of pletismography. We also evaluated their maximum oxygen uptake (VO_2 max) by means of the ergospyrometric test in order to prescribe and elaborate the program of physical training.

The volunteers in the TG then participated in a program of aerobic physical training that comprised 36 sessions. The first 12 sessions were used for adaptation and the remaining ones were used predominantly for aerobic exercises (walking/running), according to the biological and personal characteristics of the participants, the biological principles of the physical training and the results of the ergospyrometric and pletismographic tests. We adopted an intensity of 90% of the anaerobic ventilatory threshold, controlled by an individual cardiac monitor, Polar brand, model A-4. The volunteers in the CG followed their regular routine. In order to choose the intensity of physical exercise adopted in the program, we considered the fact that the literature is not clear as to the relation between an increase in the blood lactate and a panic attack[9,10,11,12]. Therefore, we did not go beyond the anaerobic ventilatory threshold, neither did we use exercises that are predominantly anaerobic, since those two factors tend to increase the levels of blood lactate and might trigger a panic attack. The tests and measurements were repeated at the end of the training period.

As regards the data analysis, we used the Kolmogorov-Smirnov test to evaluate the normal distribution of the sample and the Bartlett test to assess the homogeneity of the variances, followed by the tests of descriptive statistics, means and standard deviations. The two-way ANOVA (group factor and time factor) was used for the inter-groups analysis. The level of significance adopted was $p<0,05$ and the software used for the data analyses was the Statistic 6.0, by Stat Soft Inc.

RESULTS

The analysis of the answers in the IPAQ resulted in the classification of all the volunteers as *insufficiently active B*, since they practiced physical activities less than five times a week, and the duration of the exercise was shorter than 150 minutes in a week. The examination of the biochemical variables showed borderline values in the total cholesterol, HDL, LDL and triglycerides of all the participants before the training, that is, above the desirable levels of the reference parameters (III Brazilian Guidelines on Dyslipidemia- Brazilian Society of Cardiology, 2001)[13]. No statistically significant differences were detected between the groups. At the end of the period of physical training, there was a marked decrease in the total cholesterol of the volunteers in the TG, with a statistically significant difference in relation to the CG. We also observed a significant difference between the groups as regards the LDL. The results of the patients in the TG were significantly reduced regarding this variable, both when compared to the patients in the CG and their own basal results. No significant differences were observed between the groups as regards the variables HDL and triglycerides. The data are presented in table 1.

Table 1 - Comparison of the results of the blood tests of the CG and the TG before and after the TG carried out the physical training. The results represent the mean and the standard deviation of the values obtained.

Variable	GC (N=12)		GT (N=15)	
	Before	After	Before	After
	Mean/SD	Mean/SD	Mean/SD	Mean/SD
Cholesterol	219,33/±48,14	**225,08** /±49,69	211,80/±44,96	**200,73** * /±28,12
HDL	53,83/±17,39	55,00 ±16,79	54,00 ±16,37	56,80 ±14,55
LDL	136,00 ±37,64	**141,76** ±37,80	**127,22** ±41,05	**113,61** *+ ±27,86
Triglicerides	147,50 ±82,30	157,41 ±82,92	154,06 ± 88,11	145,13 ±73,68

* Differs from the control group in the same moment, p<0,05

\+ Differs from before in the same group, p<0,05

In relation to the measurements of body composition, we can observe that the two groups presented statistically significant different values at the beginning of the training program, when the TG presented lower body mass, higher percentage of fat and lower percentage of free fat mass than the CG. However, it is interesting to observe that the patients in the CG presented less satisfactory values in those two variables after the training period when compared to their initial values. Their percentage of fat increased and their percentage of free fat mass decreased with statistically significant differences, while the patients in the TG reduced their body mass with a statistically significant difference from the CG. Table 2 shows the measurements of body mass, percentage of fat and percentage of free fat mass of the TG and the CG.

Table 2 - Comparison of the results of the measurements of body composition of the CG and the TG, before and after TG carried out the physical training. The results represent the mean and the standard deviation of the values obtained.

Variable	GC		GT	
	Before	After	Before	After
	Mean/SD	Mean/SD	Mean/SD	Mean/SD
Body mass (kg)	**76,95** ±17,52	**78,36** + ±17,56	**75,08*** ±15,71	**73,85*** + ±14,62
% Fat	**33,04** ±6,65	**34,51** + ±6,10	**34,67*** ±1063	34,21 ±11,04
% Free fat	**66,95** ±6,65	**65,48** + ±6,10	**65,30*** ±10,65	65,76 ±11,05

* Differs from the control group in the same moment p< 0,05

\+ Differs from before in the same group, p< 0,05

DISCUSSION

The individuals in this study did not make a habit of practicing vigorous or moderate exercises or regular walks over a routine week, not even as part of their job or household chores. We also observed that their professional activities facilitated their remaining seated for many hours. They used their cars to commute, or to go from one place to another in general, except for two patients who did not need to commute, since they worked at home. We observed in this study that the patients spent 8 to 12 a day sitting or lying, reading or watching TV. These results corroborate the statements by Meyer et al.[5] on the association between panic disorder and the little practice of daily physical activity associated with the patient's professional life, household chores, sports practice or leisure activities.

In one of the works carried out by Broocks et al.[4], in which they conducted a semi-structured interview on the physical exercise habits of 38 patients with panic disorder, only three patients reported keeping a program of aerobic physical exercise before they had the first panic attack. In addition, those patients reported that they reduced the training drastically after the first panic attack. Other twelve patients reported performing light physical activities, such as riding a bicycle or walking, only twice a week, or only ten minutes of stretching in the morning.

It is possible that patients with panic disorder develop a state of continuous apprehension defined as "anticipatory anxiety", which might be related to feelings of insecurity, uncertainty and helplessness when faced with the possibility of new unexpected attacks in places where getting help might be difficult [2]. This reaction could account for the little practice of physical activities and for the tendency of not leaving home, often observed in patients with this pathological diagnosis.

In fact, a sedentary lifestyle is considered an important risk factor for the development of diseases such as cancer, obesity, diabetes mellitus, osteoporosis and cardiovascular diseases, and it is responsible for the main public health problems in Brazil and abroad[7]. Therefore, the results of the biochemical evaluation show that the aerobic physical training might be an important tool in the prevention of those diseases, not only for the general population, but mainly as an aid in the treatment of patients with panic disorder. In addition, it might reduce the chances the patient has of developing hypocinetic disorders other than panic.

Our results are in line with those in many other studies that show the aerobic training with regular physical exercises not only reduces the total cholesterol, but also induces a reduction of the LDL, an increase in the concentrations of HDL and a reduction in the concentrations of triglycerides[14,15,16,17,18,19] as well. It is noteworthy that the program of aerobic physical training was effective in relation to the patients in the TG who presented better results as regards their body composition. As we observed, the TG presented higher values of body mass than the CG before the physical training, with statistically significant differences. At the end of the period of physical training, however, the total body mass of the patients in the TG was notably reduced, while those in the patients of the CG presented a significant increase when the results in both groups were compared to their own initial values. According to the theories of physical training and of physiology of exercise [20,21,22,23,24,25,26], one might indeed expect to see a reduction in the body mass of an individual who practices aerobic physical activity regularly, and an increase in that of a sedentary individual. As regards the percentage of fat and free fat mass, however, the results were the opposite: even though the TG presented a higher percentage of fat and a lower percentage of free fat mass than the CG before the training, the patients in the CG had a significant increase in their percentage of fat and a decrease in the percentage of free fat mass.

These results can be considered coherent, since fat is considered the main energy substrate in prolonged exercises of low to moderate intensity[26]. The natural tendency would be for the patients in the TG to keep or improve their body composition

distribution and for those in the CG to keep it or have a negative distribution, since their practice of physical activity remained insufficient to promote calorie expenditure. Even though the gains in the distribution of fat and free fat mass of the TG were not statistically significant, the trend is in agreement with the results of various studies on the importance of physical exercises in any program of body mass reduction, or to avoid the range of risk for diseases as diabetes, cardiopathies and hypertension [27,28,29,30,31,32].

The fact that the best results of the TG presented a significant difference only as regards the reduction in the total body mass, as well as a trend towards the reduction in the percentage of fat and an increase in the free fat mass, might be associated with the period of training (12 weeks), which might not have been enough to promote more remarkable changes, but still proved the effectiveness of the program of physical training. Another important factor we should point out is that, before the initial evaluation, all the participants in the TG and CG presented mean values of fat percentage above the values recommended by the American College of Sports Medicine (1994), according to Blair et al. 1994[33], therefore a longer training period might have been necessary.

Another limitation of our study was that we did not control the diet of the patients during the training period. Anyway, studies show that the dietary restriction is effective only in the reduction of total body mass, and that the physical exercise is more effective in the reduction of body fat and the maintenance of free fat mass [34].

In short, our program of aerobic physical training was effective in reducing the total cholesterol, the LDL and the body mass of individuals with panic disorder. The physical training proposed, with an intensity of 90% of the anaerobic ventilatory threshold, did not trigger any episodes of panic in the patients. Consequently, it can be an important aid in the treatment of individuals with panic disorder who also have problems related to high levels of cholesterol and body mass.

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BODY COMPOSITION AND CHOLESTEROL OF INDIVIDUALS PANIC DISORDER: RESPONSE TO THE AN AEROBIC PHYSICAL TRAINING

ABSTRACT

The body composition (pletismography) and the levels of cholesterol were evaluated in individuals with panic disorder (n=15) before and after 12 weeks of a program of aerobic physical training (walking/running) and compared to those of a control group (n=12) who kept their regular routine. The levels of total cholesterol, low density lipoprotein (LDL) and the body mass of the training group were significantly reduced in relation to those in the control group. The percentage of fat in the control group increased, and the percentage of free fat mass decreased with statistically significant differences. The aerobic physical training applied to individuals with panic disorder was effective in reducing their total cholesterol, LDL and body mass. It was well tolerated, and therefore could be an effective auxiliary tool in the treatment of patients with panic disorder who also have high levels of cholesterol and overweight.

LA COMPOSITION CORPORELLE ET LE CHOLESTEROL DES INDIVIDUS QUI PRENNENT DE CRISE D'ANGOISSE PAROXYSTIQUE (L'ATTAQUE DE PANIQUE) : LA REPONSE A L'ENTRAINEMENT AEROBIC.

LE RESUME

La composition corporelle et les niveaux de cholestérol des individus qui ont de crise d'angoisse paroxystique (L'Attaque de Panique) ont été evalués avant et après d'un programme d'entraînement aerobic (marcher/courir) et comparés à un groupe contrôle (n=12) qui a pris sa routine normale. Les niveaux de cholestérol total, la lipoprotéine de bas densité (LDL) et la masse corporelle du groupe d'entraînement ont eu une réduction expressive en rélation au groupe contrôle. La pourcentage de la grasse du groupe contrôle a augmenté et la pourcentage de masse maigre a réduit trop statistiquement. L'entraînement aerobic appliqué aux individus qui prennent cette crise a été efficace pour la réduction du cholestérol total, de la lipoprotéine LDL et de la masse corporelle. Il a été bien toléré et peut être utilisé comme un important instrument d'assistance au traitement des individus qui prennent la crise de angoisse paroxystique et aussi les niveaux hauts de cholestérol et de masse corporelle.

COMPOSICIÓN CORPORAL Y COLESTEROL DE INDIVIDUOS CON TRASTORNO DE PÁNICO: RESPUESTA AL ENTRENAMIENTO FÍSICO AEROBIO

RESUMEN

La composición corporal (pletismografía) y los niveles de colesterol de individuos con trastorno de pánico (n=15), fueron evaluados antes y después de un programa de entrenamiento físico aerobio (andar/ correr) y comparados a un grupo control (n=12) que mantuvieron su rutina normal. Los niveles de colesterol total, lipoproteína de baja densidad (LDL) y la masa corporal del grupo de entrenamiento fueron significativamente reducidos con relación al grupo control. Hubo un aumento del porcentaje de grasa del grupo control y una disminución, con diferencia estadística significativa, del porcentaje de masa delgada. El entrenamiento físico aerobio aplicado a individuos con trastorno de pánico fue efectivo en la reducción del colesterol total, de la lipoproteína LDL y en la masa corporal, fue bien tolerado y puede ser un importante instrumento auxiliar en el tratamiento de individuos con trastorno de pánico que también presentan niveles elevados de colesterol y de masa corporal.

COMPOSIÇÃO CORPORAL E COLESTEROL DE INDIVÍDUOS COM TRANSTORNO DO PÂNICO: RESPOSTA AO TREINAMENTO FÍSICO AERÓBIO

RESUMO

A composição corporal (pletismografia) e os níveis de colesterol de indivíduos com transtorno do pânico (n=15), foram avaliados antes e depois de um programa de treinamento físico aeróbio (andar/correr) e comparados com um grupo controle (n=12) que mantiveram sua rotina normal. Os níveis de colesterol total, lipoproteína de baixa densidade (LDL) e a massa corporal do grupo de treinamento foram significativamente reduzidos em relação ao grupo controle. A porcentagem de gordura do grupo controle aumentou, e a porcentagem de massa magra diminuiu com diferença estatística significativa. O treinamento físico aeróbio aplicado em indivíduos com transtorno do pânico foi efetivo na redução do colesterol total, da lipoproteína LDL e na massa corporal, foi bem tolerado e pode ser um importante instrumento auxiliar no tratamento de indivíduos com transtorno do pânico que também apresentam níveis elevados de colesterol e de massa corporal.