09 - EFFECTS OF A PROGRAM FOR 8 WEEKS OF STRENGTH TRAINING ON BLOOD PRESSURE LEVELS IN REST OF ELDERLY IN NON-PHARMACOLOGICAL TREATMENT.

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INTRODUCTION

Resulting in a progressive increase in blood pressure (V GUIDELINES BRAZILIAN HYPERTENSION, 2006). Such changes may influence the cardiovascular responses to strength training. Interestingly, even in young and middle-aged, the effects of resistance training on cardiovascular function are controversial (Braith, 2006) and (Williams et al. 2007).

According Zaslavsky, (2002), aging is associated with a number of changes that culminate in the significant increase of diseases of the cardiovascular system. Among the most notable changes that accompany aging , highlight the increase in blood pressure as a result of structural and functional changes in the heart and vessels, as well as changes in the autonomic nervous system (Cheitlin, 2003) and (Singh et al. 2006).

Fleg, (1986) and Nobrega et al. (1999) argue that with aging, the aorta and the arterial tree suffer reduced distensibility of elastic structures making it more rigid. These changes increase the systolic blood pressure, the heart that leads to overload resulting in collagen deposition and thickening of the walls of the left ventricle, also increasing stiffness heart(NOBREGA et al. 1999) and (LAKATTA AND LEVY, 2003).

Evaluating the effects of resistance training on blood pressure, a meta-analysis performed by initial Kelley and Kelley (2000), which included 11 studies were observed reduction of -2 and -4 % in systolic and diastolic blood pressure, respectively. These results suggest that resistance training may also have a hypotensive effect in the elderly. However, the magnitude of change in blood pressure was different between studies, suggesting that factors related to the characteristics of the population studied and / or conducted training protocol may have influenced this magnitude.

Considering the population examined, the studies cited involved normotensive, hypertensive and/or diabetic. In hypertensive population of 6 studies involving these individuals, 4 observed a reduction in blood pressure (CASTANEDA et al. 2002) and (Stewart et al. 2005) and (TERRA et al. 2008) and (Thomas et al. 2005). However, it is important to note that in 3 of the 4 studies that showed drop in blood pressure, the sample also included normotensive.

The mechanisms responsible for blood pressure response after strength training are still unclear, both in young and middle-aged individuals and in the elderly. However, some mechanisms which relate to the regulation of blood pressure have been studied.

Regarding the effects of resistance training on cardiac structure, studies have not shown changes in mass, wall thickness or the size of the ventricular chamber (Hagerman et al. 2000) and (HAYKOWSKY et al. 2000) it is possible that the training has not withstood significant cardiac structural repercussions in the elderly, but its effect on cardiac function is still controversial. Some studies have shown maintenance of systolic function (HAYKOWSKY et al. 2000) and cardiac output (CONONIE et al. 1991) and (Anton et al. 2006) after a period of strength training. However, (CONONIE et al. 1991) noted that the maintenance of cardiac output occurred due to the reduced stroke volume is compensated by increased heart rate, which suggests that the RT has a negative effect on heart function.

The same studies Cononie et al. (1991) and Anton et al. (2006) observed that maintenance of cardiac output after resistance training also found maintenance of peripheral vascular resistance, which explains the conservation of blood pressure levels. However, although the total vascular resistance does not change with training, Anton et al. (2006) found increased flow and vascular conductance in the lower limbs, suggesting that strength training may have important peripheral effects.

OBJECTIVE

The present study aimed to investigate the effects of an eight-week program of strength training on resting blood pressure levels in the elderly under non-pharmacological treatment.

METHODOLOGY

Location, type of study, Ethical Aspects.

Data collection occurred in the school gym, Faculty of Biomedical Sciences Cacoal, practice site exercise program used in the study. The research was a cross-sectional quantitative approach, field procedure and pre-experimental feature.

The survey was conducted after approval by the Ethics Committee of the Faculty of Biomedical Sciences Cacoal - FACIMED. The approval met the recommendations by current standards, as recommended by its resolutions 196/96 and 251/97.

STUDY SAMPLE

Were used as sample for the study, all elderly women who fitted the profile of the inclusion criteria. Thus, the sample consisted of 21 elderly women with a mean age of 62.8 years.

PROTOCOLS

As materials, were used to measure blood pressure; aneroid sphygmomanometer Tycos periodically tested and calibrated, and stethoscope Rapaport, Marshall brand, serving both directions of SBH (2006). Data were collected: age, and systolic and diastolic.

The weight training program was run for 8 consecutive weeks, including three weekly sessions that were held on alternate days.

The prescription of the training program followed the order alternating segment request seeking the largest muscles or muscle groups. 7 The proposed exercises were performed in the following order: horizontal leg-press, barbell curls (biceps), leg curl , triceps triceps in the season the appliance Cross-Over, calf on the device itself, Pectoralis major and the Flying Back in Pulley.

Before the start of the program itself, it was shown how it should be performed each year in their machines, even

informing the proper care, the muscles required on each machine the possible injuries that could occur if the implementation does not occur correctly and consequently the best approach to implementing and clarifying the objectives of each exercise.

All exercises were performed in two sets of 10 repetitions maximum (RM) in the first two weeks (induction period). (Rodrigues, 1998). After the adjustment period, during the 6 weeks following the participants began to perform 3 sets of 10 repetitions, with the beginning of all training sessions participants performed a walk between 10 and 15 minutes looking for a general warming and performed a series 15 repetitions with approximately 50% load on all machines required in order to increase the specific heat in order to support the physiological and neural responses to subsequent efforts.

The rest interval between sets was set for 60-90 seconds reaching a maximum interval of 120 seconds between exercises. While execution speed of movement was not controlled, the subjects were instructed to perform each movement in 1 to 2 seconds in both the concentric phase as in the eccentric phase.

Both the initial loads and the periodic adjustments of loads used in different exercises were established based on the results obtained by applying weight tests for maximum repetitions, ranging from 55 % to 65%, as recommended by (RODRIGUES, 1998).

The subjects were instructed to training loads were adjusted whenever the upper limit prescribed repetitions for each exercise was achieved in all grades, in order to preserve the initial intensity.

STATISTICAL ANALYSIS

Data were analyzed by BioEst. version 5.0. Statistical procedures corresponded to the paired t test to analyze differences between pre-and post-tests to the same sample. We also used the delta percentage (Δ%) to determine the percentage differences of the variables in relation to pre-and post-test.

Formula for calculating the delta percentage:

$$\Delta\% = \frac{\text{(Value at the moment of interest - value at the initial)}}{\text{Absolute value at the initial}} .100\%$$

PRESENTATION AND DISCUSSION OF RESULTS

Table 1 shows the physiological variables in relation to systolic blood pressure (SBP) and diastolic blood pressure (DBP) at rest before and after a strength training program. Was observed by the paired t test that both SBP and DBP showed statistically significant at a significance level of $p \leq 0.05$, indicating that the training for the group in question contributed significantly to the reduction of blood pressure, and also using the delta method both SBP and DBP decreased their mean values over the pre-test, which is an important behavior for greater efficiency and control of the heart Blood Pressure.

Table1. Comparison of physiological variables (SBP and DBP) before and after the training program.

Variable	Pre-test (n=21)	Post-test (n=21)	Value-p	Δ%
	Average±SD	Average±SD		
Systolic Blood Pressure (mmHg)	88,81±8,79	84,23±5,31	0,0056*	-5,16
Diastolic Blood Pressure (mmHg)	133,10±14,01	125,95±8,75	0,0061*	-5,37

*p ≤ 0,05

Source: Own author (2012).

The above results corroborate with 6 studies involving elderly normotensive individuals, conducted by Simons and Andel (2006), Delmonico et al. (2005), Sallinen et al, (2005), Taaffe et al. (2007) Tsutsumi et al. (1997) whose whom found drop in blood pressure.

Suggesting that strength training is effective in reducing blood pressure in normotensive elderly. Similarly, another recent research Cornelissen and Fagard (2005) 9 studies included randomized controlled, and there drop -3.2 mmHg and -3.5 mmHg in systolic and diastolic blood pressure, respectively, after resistance training.

The reduction in resting blood pressure after strength training was observed in 10 studies (Simons and ANDEL. 2006) and (CASTANEDA et al. 2002), is also important to note that no study has shown that strength training can increase blood pressure, even in normotensive or in hypertensive patients. Delmonico et al. (2005) state that, in general, studies involving exercise intensity as classically used to develop muscular endurance, ie low intensity (50 to 65% of 1 MR - 15 MR) found in blood pressure both decrease systolic and diastolic blood pressure.

CONCLUSION

The results of this study showed that the proposed objectives, confirmed the hypothesis that the eight-week program of strength training, effectively reduce significantly both systolic as diastolic blood pressure. It is hoped that this study can cooperate to actions idealization project deployments for prevention of hypertension with the help of strength training.

From the data presented, we suggest the need for further studies involving exercises power, using different methodologies and larger sample groups because, although the resistance training is recommended for elderly and there are some hints that he may have a hypotensive effect chronic, no parallel disputes on this subject, showing that an open field investigations.

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EFFECTS OF A PROGRAM FOR 8 WEEKS OF STRENGTH TRAINING ON BLOOD PRESSURE LEVELS IN REST OF ELDERLY IN NON-PHARMACOLOGICAL TREATMENT.

ABSTRACT

This research aimed to investigate the effects of an eight-week program of strength training on resting blood pressure levels in the elderly under non-pharmacological treatment. Took part in the survey, elderly aged over 60 years. The sample consisted of 21 elderly women with a mean age of 62.8 years. The research was a cross-sectional quantitative approach, field procedure and pre-experimental feature. Data were analyzed by BioEst, version 5.0. Statistical procedures corresponded to the paired t test to analyze differences between pre-and post-tests to the same sample. We also used the delta percentage (Δ%) to determine the percentage differences of the variables in relation to pre-and post-test. The results showed statistically significant data at a significance level of $p \leq 0.05$, indicating that the training for the group in question contributed significantly to the reduction of blood pressure, and also using the delta method both arterial systolic pressure and diastolic blood Pressure decreased their average values over the pre-test, which is an important behavior for increased cardiac output and blood pressure control. From the data presented, we suggest the need for further studies involving exercises power using different methodologies and larger sample groups because, although the strength training is recommended for elderly and there are some hints that he may have chronic hypotensive effect, no parallel disputes on this subject, which shows that this is still an open field to research.

KEYWORDS: Strength Training, Blood Pressure, Elderly.

EFFETS D'UN PROGRAMME PENDANT 8 SEMAINES D'ENTRAINEMENT EN FORCE SUR LES NIVEAUX DE PRESSION ARTERIELLE AU REPOS DU PERSONNES ÂGÉES DANS TRAITEMENT NON PHARMACOLOGIQUE.

RÉSUMÉ

Cette recherche visait à étudier les effets d'un programme de huit semaines d'entraînement en force sur les niveaux de pression artérielle au repos chez les personnes âgées sous traitement non pharmacologique. Ont pris part à l'enquête, les personnes âgées de plus de 60 ans. L'échantillon se composait de 21 femmes âgées avec un âge moyen de 62,8 années. La recherche a été une approche quantitative transversale, la procédure sur le terrain et fonction de pré-expérimentale. Les données ont été analysées par BioEst, version 5.0. Les méthodes statistiques correspondaient au test t apparié pour analyser les

différences entre les pré- et post-tests pour le même échantillon. Nous avons également utilisé le pourcentage delta (Δ%) pour déterminer les différences de pourcentage des variables par rapport aux pré-et post-test. Les résultats ont montré des données statistiquement significatives à un niveau de signification de $p \leq 0,05$, ce qui indique que la formation pour le groupe en question a contribué de manière significative à la réduction de la pression artérielle, et également en utilisant la méthode delta fois pression artérielle systolique et pression artérielle diastolique ont diminué leur valeurs moyennes sur la pré-test, qui est un comportement important pour un débit cardiaque accru et de contrôle de la pression artérielle. Selon les données présentées, nous suggérons la nécessité de nouvelles études impliquant des exercices de musculation à l'aide de différentes méthodologies et les grands groupes de l'échantillon, pour que la formation de force est recommandée pour les personnes âgées et il ya quelques trucs qu'il peut avoir un effet hypotenseur chronique, aucun différend parallèles sur ce sujet, ce qui montre que c'est encore un champ ouvert à la recherche.

MOTS-CLÉS: D'entraînement en Force, La Pression Artérielle, Personnes Âgées,

EFECTOS DE UN PROGRAMA PARA 8 SEMANAS DE ENTRENAMIENTO DE FUERZA EN LOS NIVELES DE PRESIÓN ARTERIAL EN RESTO MAYOR EN TRATAMIENTO NO FARMACOLÓGICO.

RESUMEN

Esta investigación tuvo como objetivo investigar los efectos de un programa de ocho semanas de entrenamiento de fuerza en los niveles de presión arterial en reposo de los ancianos en tratamiento no farmacológico Tomó parte en la encuesta, los ancianos mayores de 60 años. La muestra estuvo conformada por 21 mujeres de edad avanzada con una edad media de 62,8 años. La investigación fue un enfoque cuantitativo transversal, procedimiento campo y cuentan con pre-experimental. Los datos fueron analizados por BioEst, versión 5.0. Los procedimientos estadísticos se correspondían con la prueba t para muestras apareadas para analizar las diferencias entre pre y post-test a la misma muestra. También se utilizó el porcentaje delta (Δ%) para determinar las diferencias porcentuales de las variables en relación con pre y post-test. Los resultados mostraron datos estadísticamente significativos a un nivel de significación de $p \leq 0,05$, lo que indica que la formación del grupo de que se trate contribuyó de manera significativa a la reducción de la presión arterial, así como en el delta de la la presión arterial sistólica y la presión arterial diastólica disminuyeron su valores medios obtenidos durante el pre-test, que es un comportamiento importante para el aumento del gasto cardíaco y la presión arterial. A partir de los datos presentados, se sugiere la necesidad de realizar más estudios con ejercicios de fuerza con diferentes metodologías y los grupos de muestra más grandes, ya que, aunque se recomienda el entrenamiento de fuerza para ancianos y hay algunos indicios de que puede tener un efecto hipotensor crónico, hay disputas paralelas sobre este tema, lo que demuestra que esto sigue siendo un campo abierto a la investigación.

PALABRAS CLAVE: Entrenamiento de Fuerza, Presión Arterial, Ancianos.

EFEITOS DE UM PROGRAMA DE 8 SEMANAS DE TREINAMENTO RESISTIDO SOBRE OS NÍVEIS PRESSÓRICOS EM REPOUSO DE IDOSAS SOB TRATAMENTO NÃO FARMACOLÓGICO.

RESUMO

Esta pesquisa teve como objetivo Investigar os efeitos de um programa de oito semanas de treinamento resistido sobre os níveis pressóricos em repouso de idosas sob tratamento não farmacológico. Fizeram parte da pesquisa, idosas com idade igual ou superior a 60 anos. A amostra foi constituída por 21 idosas, com idade média de 62,8 anos. A pesquisa foi do tipo transversal com abordagem quantitativa, procedimento de campo e com característica pré-experimental. Os dados foram analisados pelo programa BioEst, versão 5.0. Os procedimentos estatísticos corresponderam ao teste t pareado para analisar as diferenças entre o pré e pós-testes para uma mesma amostra. Também foi utilizado o delta percentual (Δ%) para determinar as diferenças percentuais das variáveis em relação ao pré e pós-teste. Os resultados obtidos demonstraram dados estatisticamente significativos ao nível de significância de $p \leq 0,05$, indicando que o treinamento para o grupo em questão, contribuiu significativamente para a redução da Pressão Arterial, e também pelo método delta tanto a pressão arterial sistólica quanto a pressão arterial diastólica diminuíram seus valores médios em relação ao pré-teste, sendo este um comportamento importante para uma maior eficiência cardíaca e controle da pressão arterial. A partir dos dados expostos, sugere-se a necessidade de outros estudos que envolvam exercícios resistidos utilizando metodologias diferentes e grupos amostrais maiores, pois, embora o treinamento resistido esteja sendo aconselhado para idosos e haja algumas alusões de que ele possa ter efeito hipotensor crônico, há paralelamente contestações sobre este assunto, o que evidencia que este ainda é um campo aberto a investigações.

PALAVRAS-CHAVE: Treinamento Resistido, Pressão Arterial, Idosos.