208 - THE COMPETING TRAINING IN WATER, AND ITS EFFECT IN WOMEN HYPERTENSION

MARCOS VALÉRIO SOARES NASCIMENTO
RAFAEL MODÉ LUNA
Universidade de Brasília – Brasília – DF – BRASIL
mr_labor@yahoo.com.br

INTRODUCTION

The prevalence of the arterial hypertension (HA) essential is raised in the world. In developed countries as the United States, about 35% of the population they are hypertensions, predominant in the black race and women. In the Brazilian population they is esteem that in accordance with the region, evidences percentages between 22,3% up to 44% of hypertensions (33). However, in Brazil about 50% it has knowledge of the illness, 40.5% of regular treatments and 10.4% only appeal to the treatment in fact.

The essential HA is an illness chronic, multifactorial, and characterized for the raised tensional levels, considered one of the main factors of risk of cardiovascular morbidity and mortality. Its high social cost is responsible for about 40% of the cases of precocious retirement and absenteeism in the work, considering mainly the productive phase of the Brazilian women. Therefore, the reductions of the weight excess, dietary practical of sodium restriction and of regular physical activity are basic to control arterial pressure, and It can normalize the levels of arterial pressure (SIMÃO and FLECK, 2007). Studies involving 217 patients of both the sexes, with age varying of 35 the 83 years, showed that the adhesion of the pharmacological measures, amongst which the practical one of physical exercise, promoted sensible effect in the reduction of the levels of arterial pressure (FERREIRA et al, 1999).

Physical Exercises and Arterial Hypertension: The treatment of the arterial pressure by programmed physical exercises (endurance and resisted) has been recommended. Some studies had verified that the physical training contributes positively in the reduction of the arterial pressure of hypertension people. Between these, it was verified that the physical training significantly reduce the arterial pressure on rest, on average of 10mmhg, as much of systolic pressure as diastolic, in the cases of light HA. However, the mechanisms of hypertension action of the arterial pressure physical after-training, are related the hemodynamics, humoral and neural factors (NEGRÃO et al., 2001).

Hydrogimnastic: physical exercise carried in liquid environment, turns able according to the objective, modifications in flexibility, muscular strength and located muscular resistance in programs of physical conditioning (ABOARRAGE 2008). They are specific aquatic exercises, centered in the exploitation of the resistance of the water as overload, with or without the additional use of devices (KRASEVEC and GRIMES, 1999). According to Ide and Lopes (2008), in accordance with the employed methodology (strength, resistance of strength or power), certain adaptations are more powerful than others, associating such adaptative effect to the trained biomotor capacity. For this modality, the orientation of the manual of the AEA (2002), is that, the temperature of the water must vary between 27 to 32 degrees (ABOARRAGE, 2008). However, the lapsing of physical exercises for hypertensions, must be attempted against for the type, intensity, frequency and duration of the systemize physical training (SIMÃO and FLECK, 2007).

Competing training: according to Guedes (2008), the competing training is the association of the training of endurance with the resisted training inside a program of physical conditioning, and this combination can happen inside the alternating form (resisted and endurance) of a session, or in alternating days of training.

Studies verify that the training of endurance can cause damages to the strength profits, power and muscular hypertrophies Bell et al. (2000); Hennessy and Watson (1994); Kraemer et al. 1995 cited for Guedes (2008). Other studies suggest that damages do not occur when the training of endurance is associated with the training of strength and muscular hypertrophy, when compared to training of strength separately (ABERNETHY and QUIGLEY, (1993); GRANELE and BLESSING, (2000); McCARTHY et al. (2002); WOOD et al. (2001)). According to Delagardelle et al. (2002), the competing training promotes superior comparative profits to the training of endurance in the improvement of the hemodynamic and profit (increase) of strength in cardiac people (pag 156, 157).

The Brazilian Society of Cardiology recommends that the hypertensions people initiate programs of regular physical exercise, since submitted previous clinical evaluation. The exercises must be on moderate intensity, three to six times per week, in sessions of 30 to 60 minutes of duration, accomplished with cardiac frequency between 60% and 80% of the maximun or enter 50% e70% of the maximum consumption of oxygen (IV Brazilian Lines of Direction of Hypertension, 2002).

METHODOLOGY

Study of case

The sample was composed by 2 (two) adult hypertension women (period 1), public officers, as voluntary participation in the study. Both not practicing of programmed physical exercises, guided by a doctor the regular practical of physical exercises.

The research last five months, when the volunteers, initially they had to present the professors, laboratorial exams to show the clinical situation. Later, they had been submitted to tests of physical evaluation. In the beginning, they had been four volunteers, three women and a man, all adults. For this study, just 2 (two) women had accomplish all the procedures until the end of the research.

Before the beginning of the training in water, the exams (laboratorial) had also been evaluated by a doctor, hired to follow the entire process. Daily, with the person in the seated position, after 5min she was submitted to measure of the PA, to evaluate her participation or not in the training. To participate of the daily trainings, it had been considered 170mmgh/PAS and 100mmgh/PAD maximum limits, and 90mmgh/PAS and 65mmgh/PAD minimum, otherwise, the medical orientation was to remain seated until reach the safe tensional limits. To evaluate the effort sensation, they used the scale of Borg. In the end of each training, the volunteers leaving from the swimming pool was conditioned to the FC levels of equal or lesser than 95bpm. Finally, it was not possible to measure the PA of the volunteers in the end of the training, because they had to return to the work.

Clinical examinations carried through before and after training: lipid profile, physical evaluation Tests carried through before and after training: anthropometric (weight and height), test of located muscular resistance (abdominal repetition in 1 minute); test to seat and to reach (bank of Wells); hand pressure, dynamometry of inferior members (back and leg dynamometer);

index of corporal mass (IMC%).

The cardiac frequency in rest and training was controlled by a frequencymetrer of polar mark of the S610i line, with transmission of data by infra-red ray, and individual use. The FC of training was determined by formula age - 220 adapted of KARVONER et col., 1957 cited for GUEDES and GUEDES (1995). The physical training (TF) occurred in a swimming pool (in slope form) of 25m discovered, in a temperature of the water between 27°C 31°C, and with depth of 1m 1.70cm of depth.

The competing training occurred in alternating days (endurance and resisted), five days in the week on Monday to Friday, in the half-day schedule.

Limitation of the method: considering the profile of the volunteers, the results can have been influenced for external, ambient factors, motivation, age, sex and everything that if can correlate with the final result.

TRAINING ENDURANCE[1]							
Frequency (sessions)	Control of the FC in water	Dynamic heating	Series	Repetitions	Pause	Relaxation	Time of Trainings
3 xs week	5'	5'	3 a 5	20 - 25	30 – 40s **ativa**	15'	75'
RESISTED TRAINING[2]							
2xs WEEK	5'	5'	2 a 4	6 - 20	1' a 1 e 30	15'	70

RESULTS

The gotten results correspond to the data of two women, both with 45 years old, that it searched to observe diverse variable before, to the during and in the end of the competing training carried through in water. The presented anthropometrics data in table 1 verify that the adopted methodology of training, can have contributed to the reduction of the corporal mass of both. For this, a lesser corporal mass minimizes the cardiovascular risk and improves the quality of life of the volunteers. However, the profit of the lean mass (table 1), can have influenced for top the results of the IMC, contributing for a lesser cardiac frequency of trainings and after-training.

The considered measures are the beginning and the end of the study. It is observed that both had gotten a weight reduction and, consequently in the IMC.

	A		% IMC	B		% IMC
Dado	início	fim		início	fim	
Peso	90	86		83	78	
Estatura	1,62			1,55		
IMC	34,29	32,77	- 4,4%	34,55	32,47	- 6,0%

In table 2, we verify the increase of the conferred muscular strength in the inferior, superior members and abdominal. In this case, such profits can be attributed to the used methodology. However, the liquid environment can have positively favored the accomplishment of the exercises (resisted and of endurance), once that, the verified profit of muscular mass, preserves the skeletal-muscle system, and the increment of the muscular strength promotes a lesser daily overload to the heart, for reduction of the cardiac debit, consequently, FC and PA. A greater input sanguine circulating during the training; lesser cardiac debit and lesser FC of trainings and rest, can produce hypotensor effect in according with adopted training. In this case, the improvement of the resistance of the central musculature exerts particular function in regards to stabilization of the position and Core, what it would facilitate the accomplishment of efforts of the daily life.

The improvement of the flexibility conferred in table 2, of weak (before exercise) to regulate (after exercise), makes possible greater amplitude of voluntary movement in the main joints, making possible, the execution of exercises of bigger intensity, as well as, minimizing the risk of joint injuries. The results of the bank test had been conferred of positive effect for the classification proposal for Wells in 1952 in the test to seat and to reach (Table 2).

The table below brings the results of the physical capacities at the beginning and in the end of the training. The two volunteers had gotten positive results in all the measures. The graphical one helps to illustrate the results.

Table 2: Results of the antropometrics data

	A		% IMC	B		% IMC
Data	Beginning	End		Beginning	End	
Weight	90	86		83	78	
Stature	1,62			1,55		
IMC	34,29	32,77	- 4,4%	34,55	32,47	- 6,0%

In table 3, it was verified a reduction of 20% in the glicemia of jejum in the volunteer A, and 22% for the voluntary B. Perhaps, physical exercise increased by a balanced diet (hipocaloric), can have prompt a reduction glicemy levels; cholesterol; LDL; VLDL and of triglycerides. It was also verified an increase of 26,1% of HDL for the volunteer A is 4,1% for the voluntary B. These results allow inferring that the benefits promoted for the competing training in water, have positively assisted in the reduction of the cardiovascular events in the volunteers, having conquered better quality of life.

The table below brings the results of the metabolic data at the beginning and in the end of the training. The lipid profile of the volunteers was modified in all the measures, what it can be attributed to the programmed physical exercise. Such modifications reduce the sprouting of cardiovascular events, and improve the quality of life of the volunteers.

Table 3: Results of the lipid profile

	A			B		
Data	Beginning	End	%	Beginning	ENd	%
Glicemia	100	80	-20,0%	86	77	-10,5%
Colesterol	225	219	-2,7%	157	152	-3,2%
HDL	46	58	26,1%	49	51	4,1%
LDL	145	129	-11,0%	89	80	-10,1%
VLDL	44	32	-27,3%	21	19	-9,5%
TG	169	162	-4,1%	94	92	-2,1%

CONCLUSION

The verified positive alterations demonstrate that the TC was efficient in the tested variable, mainly when associates with the improvement of the health and quality of life of the volunteers.

In summary, it can be said that during a period of exercise, the human body suffers cardiovascular and respiratory adaptations in order to take care of to the increased demands of active muscles e, to the measure that these adaptations are repeated, occurs modifications in these muscles, allowing that the organism improves its performance. They corroborate for these results Wilmore and Costill (2003) when telling that physiological and metabolic processes enter in action, improving the distribution of oxygen for tissue in activity. Negrão et al. (2001) they confirm when saying that the mechanisms that guide the pressures fall after physical training are related to hemodynamics factors, humeral and neural.

We conclude that the modifications of the lipid profile; IMC and of the physical capacities, they evidenced the increase of the muscular mass of the volunteers, justifies its importance of the physical exercise in the reduction of the cardiovascular risk and the improvement in the quality of life of the volunteers. In this in case that, the TC in water can have positively contributed for reduction of corporal weight, of the reduction of the taxes of cholesterol-T, TG, LDL, and increase of the HDL. Finally, the physical exercise promoted quality of life and health of the volunteers.

REFERÊNCIAS

ABOARRAGE, A. M**. Treinamento de força na água** – uma estratégia de observação e abordagem pedagógica. 2 ed. São Paulo: Phorte Editora, 2008.

FERREIRA, K. V. S.; MELO, A. M. C. A.; SOBRAL FILHO, D. C.; ARRUDA, I. K. G.; DINIZ, A. S.; TOSCANO, C. H. H. **Impacto das modificações no estilo de vida no controle da hipertensão**. Arq Bras Cardiol 1999;73(Supl IV):110.

GUEDES JUNIOR, Dilmar Pinto. **Musculação**: estética e saúde feminina. .... São Paulo: Phorte, 2008. 311 p.

GUEDES, D.P.; GUEDES, J.E.R.P. **Exercício físico na promoção da saúde**. Londrina: Midiograf, 1995. 138 p.

IDE, Bernardo Neme; LOPES, Charles Ricardo. **Fundamentos do treinamento de força** - Potência e Hipertrofia nos Esportes. São Paulo: Phorte Ed., 2008.

IV Diretrizes Brasileiras de Hipertensão 2002; cap. 5:13-14 – SBC.

KRASEVEC, J. A.; GRIMES, D. C. **Hidroginástica**. São Paulo: Hemus; 1990.

NEGRÃO, C.E.; RONDON, M. U.P. B.; KUNIYOSH, F. H.S.; LIMA, E. G. Aspectos do treinamento físico na prevenção da hipertensão arterial. Revista Hipertensão, 2001;4. Disponível em URL: http//www.sbh.org.br/revista/2001_2001_V4. Acesso em 11maio 2003

SIMÃO, Roberto; FLECK, Steven. **Força - Princípios metodológicos para o treinamento**. São Paulo: Phorte Ed., 2007.

WILMORE J. H.; COSTILL, D. L.. **Controle cardiovascular durante o exercício**. In: Fisiologia do esporte e do exercício. 2a ed. São Paulo: Manole, 2003.

ABSTRACT

Essential the Arterial Hypertension is an illness chronic, multifactorial, and characterized for the raised tensional levels, considered one of the main factors of risk of cardiovascular morbidity and mortality. The treatment of the PA by means of the programmed physical exercises (endurance and resisted) has been recommended. Some studies had verified that the physical training contributes positively in the reduction of the arterial pressure of hypertension individuals. The hydro gymnastics as carried through physical exercise in half liquid, in accordance with makes possible the objective, modifications in flexibility, muscular force and located muscular resistance in programs of physical conditioning. The competing training is the association of the training of endurance with the resisted training inside of a program of physical conditioning, and this combination can occur inside of alternating form of a session, or in alternating days of training. Study of case with composed sample for two adult women hypertension (period of training 1), public officers and voluntary in the study. The research had duration of five months, where the volunteers had initially presented the laboratorial professors, examinations and later, the tests of physical evaluation had been submitted. Before the beginning of the training in water, the clinical examinations had been evaluated by a doctor, who followed the process. Considering the profile of the volunteers, the results can have been influenced for external, ambient factors, motivation, age, sex and everything that if can correlate with the final result. The verified positive alterations demonstrate that the TC was efficient in the tested 0 variable, mainly when associates with the improvement of the health and quality of life. In this in case that, the TC in water can have positively contributed for reduction of corporal weight, the reduction of the taxes of cholesterol-t, TG, LDL, and the increase of the HDL. Finally, the physical exercise promoted quality of life and health of the volunteers.

KEYWORD: hypertension - competing training – women.

RÉSUMÉ

La hypertension artérielle essentielle est une maladie chronique, une multifatorial, caractérisée par les élevés niveaux de tension, considérée un des principaux facteurs de risque de morbité et de mortalité cardiovasculaires. Le traitement du PA au moyen des exercices physiques programmés (endurance et résistée) a été recommandé. Plusieurs études ont vérifié que la formation physique contribue positivement dans la diminution de la pression artérielle de personnes à des hipertensos. La hidroginástica je mange exercice physique réalisé dans demi liquide, rend possible conformément à l'objectif, à modifications dans la flexibilité, à force musculaire et à résistance musculaire localisée dans des programmes de conditionnement physique. La formation simultanément est l'association de la formation d'endurance avec la formation résistée à l'intérieur d'un programme de conditionnement physique, et cette combinaison peut se produire de forme alternative à l'intérieur d'une session, ou des jours alternatifs de formation. Étude de cas ave c échantillon composé par deux femmes adultes hipertensas (stage 1), fonctionnaires publiques et volontaires dans l'étude. La recherche a eu durée de cinq mois, où les volontaires, initialement ont présenté les enseignants, les examens en laboratoire et ultérieurement, ils ont été soumis à des essais d'évaluation physique. Avant le début de la formation dans eau, les examens cliniques ont été évalués par un médecin, qui a accompagné le processus. En considérant le profil des volontaires, les résultats peuvent avoir été influencés par des facteurs externes, environnementaux, de la motivation, de l'âge, du sexe et tout qui se peut se corréler avec le résultat final. Les modifications positives vérifiées démontrent que TC a été efficace dans les variables expérimentées, principalement quand associées avec l'amélioration de la santé et de la qualité de vie. Dans ce cas, TC dans eau peut avoir contribué positivement à réduction de poids corporel, de la réduction des taux de colesterol-T, TG, LDL, et de augmentation de HDL. Finalement, l'exercice physique a promu qualité de vie et santé des volontaires.

PALAVRAS-CHAVE : hipertensão - formation simultanément - femmes

RESUMEN

La Hipertensión arterial esencial es una enfermedad crónica, multifactorial, caracterizada para los niveles levantados del tensional, considerada uno de los factores principales del riesgo del morbididad cardiovascular y mortalidad. El tratamiento del PA por medio de los ejercicios físicos programados (resistencia y resistido) se ha recomendado. Algunos estudios habían verificado que el entrenamiento físico contribuye positivamente en la reducción de la presión arterial de los individuos de los hipertensos. El hidrogimnasia según lo llevado con ejercicio físico en medio líquido, de acuerdo con las marcas posibles el objetivo, modificaciones en flexibilidad, fuerza muscular y resistencia muscular localizada en programas del acondicionamiento físico. El entrenamiento competente es la asociación del entrenamiento de la resistencia con el entrenamiento resistido dentro de un programa del acondicionamiento físico, y esta combinación puede ocurrir dentro de forma que se alterna de una sesión, o en días que se alternan del entrenamiento. Estudio del caso con la muestra compuesta para dos hipertensas de las mujeres del adulto (período del entrenamiento 1), los oficiales y el voluntario públicos en el estudio. La investigación tenía duración de cinco meses, donde los voluntarios, había presentado inicialmente a profesores de los laboratoriales, examinaciones y más adelante, las pruebas de la evaluación física habían sido sometidas. Antes del principio del entrenamiento en agua, las examinaciones clínicas habían sido evaluadas por un doctor, que acompañó el proceso. En vista del perfil de los voluntarios, los resultados se pueden haber influenciado para los factores, la motivación, la edad, el sexo y todo externos, ambiente que si puede correlacionar con el resultado final. Las alteraciones positivas verificadas demuestran que el TC fuera eficiente en las 0 variables probada, principalmente cuando los asociados con la mejora de la salud y de la calidad de la vida. En esto en caso de que eso, el TC en agua pueda haber contribuido positivamente para la reducción del peso corporal, de la reducción de los impuestos del colesterol-t, del TG, de LDL, y del aumento del HDL. Finalmente, el ejercicio físico promovió la calidad de la vida y la salud de los voluntarios.

PALABRA-LLAVE: hipertensión - entrenamiento competente - mujeres

RESUMO

A Hipertensão Arterial essencial é uma doença crônica, multifatorial, caracterizada pelos elevados níveis tensionais, considerada um dos principais fatores de risco de morbidade e mortalidade cardiovasculares. O tratamento da PA por meio dos exercícios físicos programados (endurance e resistido) tem sido recomendado. Vários estudos verificaram que o treinamento físico contribui positivamente na diminuição da pressão arterial de indivíduos hipertensos. A hidroginástica como exercício físico realizado em meio líquido, possibilita de acordo com o objetivo, modificações na flexibilidade, força muscular e resistência muscular localizada em programas de condicionamento físico. O treinamento concorrente é a associação do treinamento de endurance com o treinamento resistido dentro de um programa de condicionamento físico, e essa combinação pode ocorrer de forma alternada dentro de uma sessão, ou em dias alternados de treinamento. Estudo de caso com amostra composta por duas mulheres adultas hipertensas (estágio 1), funcionárias públicas e voluntárias no estudo. A pesquisa teve duração de cinco meses, onde as voluntárias, inicialmente apresentaram aos professores, exames laboratoriais e posteriormente, foram submetidas a testes de avaliação física. Antes do inicio do treinamento em água, os exames clínicos foram avaliados por uma médica, que acompanhou o processo. Considerando o perfil das voluntárias, os resultados podem ter sido influenciados por fatores externos, ambientais, motivação, idade, sexo e tudo que se pode correlacionar com o resultado final. As alterações positivas verificadas demonstram que o TC foi eficiente nas variáveis testadas, principalmente quando associadas com a melhoria da saúde e qualidade de vida. Nesse caso, o TC em água pode ter contribuído positivamente para redução de peso corporal, da redução das taxas de colesterol-T, TG, LDL, e aumento do HDL. Por fim, o exercício físico promoveu qualidade de vida e saúde das voluntárias.

PALAVRAS-CHAVE: hipertensão – treinamento concorrente - mulheres