197 - RELATION BETWEEN THE CARDIAC FREQUENCY AND THE SUBJECTIVE PERCEPTION OF EFFORT OF HIDROGINÁSTICA PRACTITIONERS.

WILLIAN O'HARA DIAS DA CRUZ SOUZA; JULIANA SOARES
CURSO DE EDUCAÇÃO FÍSICA_ LAFIEX_ CAMPUS AKXE
UNIVERSIDADE ESTÁCIO DE SÁ; RIO DE JANEIRO; RIO DE JANEIRO; BRASIL
willian_oharadcs@yahoo.com.br

INTRODUCTION

The psicofisiologia of the perceived effort is a situated field partially inside of the psicofísica, the scientific field that it deals with the mensuração of the sensorial perceptions. The psicofísica has subcarriers as detention, identification, discrimination and gradual classification, being this last item cited most important for the perceived effort (BORG, 2000). The concept of perceived effort and the construction of the scale of subjective perception of effort (PSE) mean that higher correlations must be gotten with physiological 0 variable that measure the relative intensity of the exercise, and with that do not measure the absolute intensity (Pandolf, 1983; Borg, 1977 apud BORG, 2000). A concept related to the fatigue and the effort is the intensity of the exercise. The intensity of the exercise can receive one meaning physical established in the stimulaton and defined for physical mensurações as force, work and energy, torque, speed etc. Also can be interpreted fisiologicamente, in absolute terms as oxygen consumption (VO2), or for relative values as the cardiac frequency (FC). One another possibility consists of evaluating the intensity of the exercise in terms of determination of indices of subjective intensity, as the perception of the individual. This method directly provides a individualizada measure of the intensity of the exercise. Since the FC is a good measure of relative intensity of the exercise, many carried through studies involving maximum tests and sub-maximums, mainly in rolling and cicloergômetros mats as the test of Wingate, the Cycling Strength Test and the simple of race or walked test have used correlations between PSE, VO2 and FC as evidence of the competing validity. The fact of the PSE to be a individualizada measure of relative tension, and not of absolute tension, makes with that the interest for the correlation of the same one with relative values of the FC grows (BORG, 2000). Segundo Kruel (2003) in relation to the behavior of the FC in the aquatic way, literature is contradictory, therefore while diverse authors affirm that a bradicardia occurs during the immersion, others affirm that a taquicardia occurs, and still exist the ones that tell that alterations do not occur. Being thus, the use of scales of effort perception can be a way adjusted for the control of the intensity in aquatic activities, as the hidroginástica, modality that, according to Aboarrage (2003), each time more occupies space between individuals that look the physical activity to supply lacks related to the health.

OBJECTIVE OF THE STUDY

To investigate and to correlate answers of cardiac frequency and subjective perception of effort of practicing mature women of hidroginástica.

ELECTION OF THE CITIZENS

10 citizens, pparently healthful had been selected for this research, of the feminine sort, with ages between 40 and 60 years, that at least had 3 months of practical of the hidroginástica modality. The weekly frequency of practical was not considered for election of the citizens. The volunteers participated of a program of hidroginástica in an academy of the zone west of the city of Rio De Janeiro.

PROCEDURES OF COLLECTION OF DATA

The data had been collected in a lesson planned for the author of the present study, that is described in Appendix C. The FC was verified with the individuals seated in a chair, after 5 minutes, for attainment of the value in rest; inside of water, the FC rest was surveyed 5 minutes of vertical immersion after, with depth of the water in the line of the appendix xifóide, with monitors of the Polar mark, in such a way to get the difference of the same one in land how much in the half liquid. During the lesson-test, to each 5 minutes the FC of the individuals was verified and requested they who in accordance with attributed to a value to its effort the options offered for the scale of used subjective perception (Attached). The scale of Borg of 15° was chosen for the study. The lesson-test lasted 35 minutes, being applied the same exercises for all the individuals. All the individuals had been submitted to the practical one of the exercises that had been part of the research, before the accomplishment of the lesson-test in itself, as well as already were made familiar to the scale of used Borg.

LIMITATIONS OF THE STUDY

This research can have suffered interferences from some not controlable factors, as: fenótipo and genotype; alterations in the habits of life of the individuals (sleep, professional or daily activity) capable to modify the physiological answers to the exercises and modifications in the psychological state of the citizens, that result in somatic influences.

STATISTICAL TREATMENT

The present study it observed the techniques of the Descriptive Statistics to characterize the observed sample, according to parameters of average and shunting line-standard, a time that the experimental 0 variable are of parametric content. The second part of the analysis statistics consisted of the application of the tests correlates - Inferencial Statistics - in the direction to verify and to test the hypothesis main of the study. For in such a way the protocol of Pearson was used. Considering that the experiment consisted of an evaluation distributed throughout a secular series with each estrato presenting characteristic values of the moment of the comment, the inference of normatização of the data became necessary, in the direction to establish an only referencial that becomes possible to constitute a correlacional analysis between the two used processes. Thus being, one was overcome as value reference to the measures taken in the rest condition index 1 (one) or 100% and the too much values are of the water as, numerical representations guided by this, that is, index (i) = Value Obs (i)/Rep Value is d´água. A consisting time the values you accuse, applied the test of correlation of Pearson, observing a level of significance $p < 0,05$.

PRESENTATION AND QUARREL OF THE RESULTS

The use of tables and figures was adopted in the present study for demonstration of the gotten results. In table 1, the absolute values and normatizados to the PSE (Scale of Borg) indicated by the pupils meet referring.

Tabela 1: Valores absolutos e normatizados da PSE na aula de hidroginástica

Borg	Absoluto	Normatizado
RF_H20	6,0 (0,0)	1,0 (0,0)
RD_H20	6,0 (0,0)	1,0 (0,0)
T5min	11,1 (1,7)	1,9 (0,3)
T10min	11,9 (1,6)	2,0 (0,3)
T15min	12,7 (1,2)	2,1 (0,2)
T20min	13,1 (1,3)	2,2 (0,2)
T25min	13,4 (1,8)	2,2 (0,3)
T30min	13,3 (0,8)	2,2 (0,1)
T35minAl	7,8 (1,9)	1,3 (0,3)

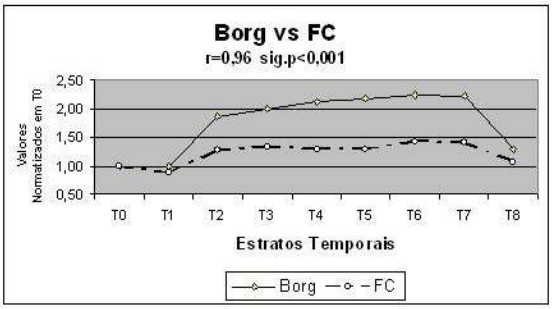
It is verified that the seen results if in its absolute average values, for one n=10, according to changeable of perception of effort of Borg presented an equal average the 6,0 ? 0,0 for the moment is of the water in 6,0 rest and ? 0,0 at the moment inside of the water in rest; verifying increases in the PSE during the lesson. Borg (2000) quotation that value 6 was chosen to initiate the scale therefore would relate to the FC of rest of many adults. As cited for Pollock; Wilmore (1993), degrees 6 and 7 represent rest; therefore, the data gotten in this study go to the meeting of literature. Still, it is verified that it enters 15 and 30 minutes (specific part of the lesson), had been gotten the biggest values of PSE, situated between 12 and 13, approximately, that they correspond to "a short while intense" effort (BORG, 2000). As cited for the ACSM (2003), intensity adjusted for improvement of the cardiorespiratória aptitude expects, as, indices between 12 the 16, when if ? for control of the effort uses Escala de Borg of 15, what it allows to speculate that the intensity of the session of hidroginástica of the present study was adjusted for improvement of this physical quality.

Tabela 2: Valores absolutos e normatizados da freqüência cardíaca na aula de hidroginástica

FC	Absoluto	Normatizado
RF_H20	84,7(7,5)	1,0(0)
RD_H20	73,1(6,8)	0,9(0,1)
T5min	105,8(12,6)	1,3(0,2)
T10min	111,9(14,3)	1,3(0,2)
T15min	108,5(15,2)	1,3(0,2)
T20min	108,7(15,9)	1,3(0,2)
T25min	119,5(15,7)	1,4(0,2)
T30min	118,2(14,1)	1,4(0,2)
T35minAl	89,7(12,2)	1,1(0,1)

Analyzing table above, it is noticed to it reduction of the FC of rest when the individuals are immersed, what it goes to the meeting of the literature, that associates alteration of the FC the determined physical laws, as the hydrostatic pressure and the fluctuation, and other mechanisms, as the consequence of diving (DI MASI; BRAZIL, 2006). Still, one observes bigger values of FC between 25 and 30 minutes, moment soon followed by stimulatons of relaxation, aiming at to reduce the metabolic request, what also it was reached in the present study. Di Masi; Brazil (2006) cites that it is widely accepted that has a bradicardia during the immersion in the half liquid, as much in rest as in exercise, when compared with activities carried through in the terrestrial way. For existing difference in the FC in the half liquid and the terrestrial way, an obstacle becomes the lapsing of the exercise for it, having that to give attention in some points as: To have knowledge that has an alteration in the FC with the immersion and formulas proposals they are for exercises in land and that the existing formulas for the half liquid are not validated cientificamente.

Figura 1: Correlação entre FC e PSE na sessão de hidroginástica



A correlation was found significant enters the indices of PSE and FC in the session of hidroginástica elaborated for this research (r= 0,96), with value of p<0,001. Diverse studies demonstrate the existing correlation between the PSE and the FC (references), however, in the hidroginástica, few searched investigating this phenomenon had been carried through. To sound; Hunter (2000), comparing answers of FC and PSE in intervaladas lessons of hidroginástica, had also found association enters these two ways of control of the intensity. As cited for the ACSM (2003), the intensity of the aeróbicos exercises can be controlled analyzing these two 0 variable, being that indices of 60 70% Fcmax are related the values of PSE of 12 the 13 degrees. Di Masi; Brazil (2006) cites that, due to the alterations of the FC in the half liquid, it is of extreme interest the use of scales of subjective perception of effort, for better control of the intensity and security of the exercise. Segundo Borg (1982 apud POLLOCK; WILMORE, 1993) the PSE and the FC are two parameters that if complement. In the present study, a significant correlation between them was verified, being able itself to infer that it is possible to previously control the intensity of the lessons through the PSE, since the FC presents great variations and some disadvantages for use in the half liquid, as cited.

CONCLUSIONS AND RECOMMENDATIONS

Through the data gotten in this study, it was verified affirmation of the alternative hypothesis, that is, it had correlation (r=0,96) between PSE and FC in the lesson of used hidroginástica. Therefore, for a good monitoração of the intensity of the training in the hidroginástica, the scale of subjective perception of effort, associated or not with other physiological parameters can be used. It must always be remembered that with the immersed body in the half liquid, generally a bradicardia occurs, and the existing formulas for the calculation of a white FC in this environment are not validated cientificamente. For the reason not to have many studies related to the modality of hidroginástica and each day the search for the same one to increase, sends regards that pupils and researchers verify if the results of this study are valid with other methods of training, individuals of another etária band and of the masculine sort.

REFERÊNCIAS

ABOARRAGE, Nino. **Hidro Treinamento.** Revisão Cristina Wollf. 2 ed. Rio de Janeiro: Ed. Shape, 2003.

BATES, A; HANSON, N. **Exercícios Aquáticos Terapêuticos.** São Paulo: Ed. Manole, 1998.

BORG, Gunnar. **Escala de Borg para a Dor e o Esforço Percebido.** Tradução Fernando G. do Nascimento; Revisão Mauro A. Guiselini, Andréa Cozzolino e Maria A. Monteiro. 1.ed. brasileira. São Paulo: Ed. Manole, 2000.

CONSELHO NACIONAL DE SAÚDE. **Diretrizes e normas regulamentadoras de pesquisa envolvendo seres humanos.** Brasília: Ministério da Saúde, 1997.

DELGADO, César; DELGADO, Shirley. **A Prática da Hidroginástica.** Revisão Cristina da Costa Pereira. 2 ed. Rio de Janeiro: Ed. Sprint, 2004.

DI MASI, Fabrízio. **Hidro.** Propriedades Físicas e Aspectos Fisiológicos. Revisão Cristina da Costa Pereira. 2 ed. Rio de Janeiro: Ed. Sprint, 2003.

DI MASI, Fabrízio; BRASIL, Roxana. **A Ciência Aplicada à Hidroginástica.** Rio de Janeiro: Ed. Sprint, 2006.

ERNEST; W. MAGLISCHO. **Nadando Ainda Mais Rápido.** Tradução Fernando G. do Nascimento; Revisão Oscar A. Erichsen. 1 ed. Brasileira. São Paulo: Ed. Manole, 1999.

GARY, J. Balady; et all. **American College of Sports Medicine:** Diretrizes do ACSM para os Testes de Esforço e sua Prescrição. Tradução Giuseppe Taranto. 6. ed. Rio de Janeiro: Ed. Guanabara, 2003.

KRUEL, L.F. Martins. Pesquisa Sobre Treinamento na Água. In: ABOARRAGE, Nino. **Hidro Treinamento.** Rio de Janeiro: Ed. Shape, 2003. p. 175-193.

MARCONI, M. de Andrade; LAKATOS, E. Maria. **Fundamentos da Metodologia Científica.** 5 ed. São Paulo: Ed. Atlas, 2003.

MICHAEL L. POLLOCK; JACK H. WILMORE. **Exercícios na Saúde e na Doença:** Avaliação e Prescrição para Prevenção e Reabilitação. Tradução Maurício L. Rocha. 2 ed. Rio de Janeiro: Ed. Medsi, 1993.

SKINNER, T. Alison; THOMSON, M. Ann. **Duffield:** Exercícios na Água. Tradução Dr. Nelson G. de Oliveira. 3 ed. São Paulo: Ed. Manole, 1985.

SOARES, J. S. ; MONTEIRO, A.G. **Controle da Intensidade na Hidroginástica Utilizando o Interval Training.** Revista Metropolitana de Ciências do Movimento Humano. São Paulo: v.4, n.1, p. 25-30, 2000.

SUSAN, Allen; et all. **Aquatic Exercise Association:** Manual do Profissional de Fitness Aquático. Tradução Beatriz Caldas Cinthya da S. Cezar; Revisão Fabrízio Di Mais e Roxana M. Brasil. Rio de Janeiro: Ed. Shape, 2001.

WILLIAM, D. Mcardle; FRANK, I. Katch; VICTOR, L. Katch. **Fisiologia do Exercício:** Energia, Nutrição e Desempenho Humano. Tradução Giuseppe Taranto. 5. ed. Rio de Janeiro: Ed. Guanabara, 2003.

Endereço: Estrada da Barra de Guaratiba n° 9381
E-mail: willian_oharadcs@yahoo.com.br
Tel.: 2410-8237 / 9312-5558

RELATION BETWEEN THE CARDIAC FREQUENCY AND THE SUBJECTIVE PERCEPTION OF EFFORT OF HIDROGINÁSTICA PRACTITIONERS.

ABSTRACT: The control of the intensity in the aquatic environment, still today, is a question very argued by literature, due to physiology to be different in the exercises carried through in water and land. In the aquatic environment, reduction in heart rate occurs and formulas for the establishment of a target heart rate (HR) are not scientifically validated. Therefore, the objective of this study was to investigate answers of heart rate and perceived exertion in water exercises practitioners. The present research was classified as almost experimental of field in a exploratory concept. 10 women, apparently healthful had been selected for this research, with ages between 40 and 60 years, that at least had 3 months of practical. Using a heart rate monitor (Polar), the HR was verified with the individuals seated in a chair, after 5 minutes, for attainment of the value in rest; inside of water, the HR rest was surveyed 5 minutes of vertical immersion after, with depth of the water in the line of the xiphoid process. Also it was used scale of Borg of 15°. During the class, with total duration of 35 minutes, to each 5 minutes the HR of the individuals was verified and requested they who attributed a value to its effort. For treatment of the data, beyond the descriptive statistics, the test of Pearson was used, to correlate the 0 variable of the study, that had been to impose norms in accordance with the values gotten in the rest condition. The joined results had demonstrated a significant correlation (r=0,96) enter the values of HR and subjective exertion perception (SEP), with level of significance of p<0,01. Thus, it is concluded that the control of the intensity in water exercises classes through the effort perception is possible, practical method and of easy learning on the part of the practitioners. Research with individuals of the masculine sex, other ages and methods of training is recommended, for deepening on this subject. **Word-key:** Subjective exertion perception. Heart rate. Water exercises.

ÉTUDE COMPARATIVE IL ÉCRIT le MODÈLE DE LA VIE et le PROFIL ANTROPOMÉTRICO des TROIS COMMUNAUTÉS INDIGÈNES de la VILLE DE MANACAPURU AM

RESUMÈ

Les auteurs divers de la disent à influence de l'homme puisque l'arrangement viennent fournissant des changements des habitudes indigènes ; comme modèle de la vie, de l'alimentation, et du sedentarismo. (MENEGOLLA, 2006, ARRUDA, 2003, LAIT, 2006). L'objectif de cette étude était de vérifier que le modèle des paramètres de la vie et de quelques antropométricos de trois a situé les communautés indigènes dans la ville de Manacapuru, Amazone, pendant l'opération Amazônia 2006 dans le projet de Rondon. Des statistiques descriptives ont été réalisées la mode pour le modèle de la ligne norme de la vie, de moyenne, de minimum, maximum et de manoeuvre pour l'anthropométrie. Cette étude les sortes avec l'âge entre 28 a eu comme individus témoin 23 des les deux le ± 10 ans. Les résultats avaient montré ce que les études diverses de la littérature ont alerté, la présence de marcante du sedentarismo dans les deux communautés, le manque de soin avec la santé, combien les aspects préventifs appellent l'attention le manque un service de santé pour les Indiens de cette région. Ils présentent le bon rapport dans la communauté et une certaine commande à l'estresse il, l'IMC était entre normal et le poids excessif dans sa majorité, avec un certain degré d'atteinte 1 d'obesidade et un degré 2, dans le pourcentage de gros a eu des valeurs à côté de la moyenne dans la classification, principalement dans les communautés à côté de la ville, Sahu-apé et Guiribé, des trois que la communauté avec un meilleur index de graisse est du Jatuarana, a peut-être eu dans la distance et la difficulté de l'accès la ville, seulement dirigé vers la scie fluvial, l'un ou l'autre un facteur à considérer dans cet aspect. Nous concluons ce indépendant de la proximité de la ville ou pas, la politique de la santé de la région est déficiente pour les communautés, un modèle actif de la vie est lointaine pour faire partie de ses routines aussi bien que des habitudes salubres de l'alimentation, les facteurs qui pourront en mesure à l'acometer par augmentation de risque la santé de la même chose ceux.

ESTUDIO COMPARATIVO INCORPORA EL ESTILO DE LA VIDA Y EL PERFIL ANTROPOMÉTRICO DE TRES COMUNIDADES ABORÍGENES DE LA CIUDAD DE MANACAPURU AM

RESUMEN

Los autores diversos de la la dicen a influencia del hombre puesto que viene el colocar proporcionando cambios en los hábitos aborígenes; como estilo de la vida, de la alimentación, y del sedentarismo. (MENEGOLLA, 2006, ARRUDA, 2003, LECHE, 2006). El objetivo de este estudio era verificar que el estilo de los parámetros de la vida y de algunos antropométricos de tres situó a comunidades aborígenes en la ciudad de Manacapuru, Amazon, durante la operación Amazônia 2006 en el proyecto de Rondon. La estadística descriptiva fue llevada con la manera para el estilo de la línea estándar de la vida, del promedio, del mínimo, máxima y del desvío para la antropometría. Este estudio las clases con edad entre 28 tenía como individuos de la muestra 23 de ambos ± 10 años. Los resultados habían demostrado lo que alertaron los estudios diversos de la literatura, la presencia del marcante del sedentarismo en dos comunidades, la carencia del cuidado con la salud, cuánto los aspectos preventivos llaman la atención la carencia un servicio de la salud para los indios de esta región. Presentan la buena relación en la comunidad y cierto control al estresse, el IMC estaba entre normal y el exceso de peso en su mayoría, con un cierto grado 1 del obesidade que alcanzaba y el grado 2, en el porcentaje de gordo había conseguido valores al lado del promedio en la clasificación, principalmente en las comunidades al lado de la ciudad, Sahu-apé y Guiribé, de los tres que la comunidad con un índice mejor de la grasa está del Jatuarana, quizás que tenía en la distancia y la dificultad del acceso la ciudad, sólo estuvo hecho para la sierra fluvial, cualquier un factor que se considerará en este aspecto. Concluimos esa independiente de la proximidad de la ciudad o no, la política de la salud de la región es deficiente para las comunidades, un estilo activo de la vida es lejana ser parte de sus rutinas así como los hábitos saludables de la alimentación, los factores que podrán al acometer al aumento del riesgo la salud igual unas.

RELAÇÃO ENTRE A FREQÜÊNCIA CARDÍACA E A PERCEPÇÃO SUBJETIVA DE ESFORÇO DE PRATICANTES DE HIDROGINÁSTICA.

RESUMO

Introdução: O controle da intensidade no meio líquido, ainda hoje, é uma questão muito discutida pela literatura, devido à fisiologia ser diferente nos exercícios realizados em água e terra. No meio líquido ocorre uma bradicardia e as fórmulas existentes para o cálculo de uma freqüência cardíaca (FC) alvo não são validadas cientificamente. Objetivo: Investigar respostas de FC e percepção subjetiva de esforço em praticantes de hidroginástica. Metodologia: O estudo se apresenta de forma quase experimental exploratório. Foram selecionados para pesquisa 10 sujeitos, aparentemente saudáveis, do gênero feminino, com idades entre 40 e 60 anos, com no mínimo 3 meses de prática. Utilizando-se um monitor da marca Polar, a FC foi verificada com os indivíduos sentados, após 5 minutos, para obtenção do valor em repouso; dentro d'água, a FC repouso foi aferida após 5 minutos de imersão vertical, com profundidade da água na linha do apêndice xifóide. Também utilizou-se a escala de Borg de 15. Durante a aula, com duração total de 35 minutos, a cada 5 minutos foi verificada a FC dos indivíduos e solicitado a eles que atribuíssem um valor ao seu esforço. Para tratamento dos dados, além da estatística descritiva, utilizou-se o teste de Pearson, para correlacionar as variáveis do estudo, que foram normatizadas de acordo com os valores obtidos na condição de repouso. Resultados: Os resultados encontrados demonstraram uma correlação significativa (r=0,96) entre os valores de FC e percepção subjetiva de esforço (PSE), com nível de significância de p<0,01. Conclusões: O estudo mostrou ser possível o controle da intensidade em aulas de hidroginástica através da percepção de esforço, método prático e de fácil aprendizagem por parte dos alunos. Pesquisas com indivíduos do sexo masculino, outras faixas etárias e métodos de treinamento são recomendados, para aprofundamento sobre este assunto.

Palavras-chave: Percepção subjetiva de esforço. Freqüência cardíaca. Hidroginástica.