134 - IDENTIFICATION OF LACTATE THRESHOLD IN PARTICIPANTS OF ACTIVITIES AT THE GYM: STEP.

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INTRODUCTION

Thinking about health and quality of life, physical activity plays a key role in achieving acceptable and recommended values to live well. Today, there are countless ways and forms of sport being one of them the workout at the gym, which motivates and causes great interest to its participants, due to the way it is executed.

The concept of Lactate Threshold (LT) has been the subject of countless scientific research since the 1950s with the first findings of Hollmann and Hettinger1. Today the lactate threshold has become one of the most useful tools to determine the physical condition and a safe prescription of physical exercises, allowing a good assessment of the momentary resistance status and as a momentary assessment of gym members we can perform lactate threshold analysis, thus determining the physical condition of practitioners of step2.

Production of lactate is accelerated when the exercise becomes more intense and the muscle cells fail to oxidize the lactate production at normal pace, nor aerobically meet the additional energy demands3.

With the increase in intensity of exercise, the lactic acid is produced from incomplete disintegration of carbohydrates, this occurs within anaerobic glucose system which has the objective to generate energy for re-synthesis of few moles of ATP, so to provide a little more energy for intense activity 4.

During exercise, the lactic acid is oxidized by the heart and neighboring muscle fibers with high oxidative capacity. Once the lactic acid removal cannot be made effectively a large accumulation of lactate produced during intermittent exercise is found, thus creating greater acidity in muscle and may be a cause of muscular fatigue3.

The point where the non-linear increase in blood lactate occurs during exercise is called lactate threshold, or beginning of accumulation of lactate in the blood5.

The region in which the blood lactate shows a systematic increase equal to or above a level 4, 0mmol/L is called the beginning of the accumulation of lactate in the blood, or simply OBLA (onset of blood lactate accumulation) 3.

After the intermittent exercise, a large amount of lactate is found in the blood

and in skeletal muscle and to adequate and fast recovery occurs, it is necessary that the individual continues performing a lower intensity aerobic activity, respecting the exercise that was carried out previously, this way an active recovery occurs, similar to procedures for getting back to back to calmness3, 5.

The activity that will be addressed in this article is the step, a form of aerobic gymnastics adopted in several fitness centers in Brazil, where the body is actively worked with a musical stimulus and sync movements, being that the BPM used to determine the intensity of the activity for advanced students is equal to or exceeding 142bpm.

Step classes can generate a great impact. So, several basic cares must be taken by the students, like gently getting on and off the step, avoiding hyperextension of the knees as well as not projecting your knees to the front above the 90 ° angulations. These precautions are very important in all classes, both for beginners and advanced students.

In a class of 45 minutes of step occurs a burning of about 450kcal, what can be considered as a high-intensity activity in the universe gym exercise. That is why this modality was chosen for the present study6.

Aiming at improving the quality of the gym classes in fitness centers and the theoretical academic basis, we search to find the lactate threshold of gym-goers: Step. For that, it was determined as the objective of this study, identifying the lactate threshold in classes of step in a gym.

METHODOLOGY

POPULATION

For this study, 2 women participants of step classes for at least 6 months aged 30 and 35 were selected. The participants received general guidelines about the study, and after signing the deed of free and informed consent, they participated on the data collections.

INSTRUMENTS

For collecting the lactate, we used strips of lactose Mm Lactate of Roche, pens and needles Accu Cher Softclix Pro from Roche and Roche Accutrend Lactate.

PROCEDURES

For control procedure on the treadmill, the Bruce, Kusumi and Hosmer effort test was selected, where the workload is increased by changing the speed of the treadmill and the level of inclination. In the first stage (1 to 3 minutes) of the test, the individual walked on speed 1, 7mph under a slope of 10%. At the beginning of the second stage (min 4 to 6), the inclination was increased to 2% and the speed to 2,5 mph (67 m/min). On each subsequent stage of the test, the inclination was increased by 2% and the speed by 0.8 or 0.9 mph (21.4 or 24.1 m/min) until the person reaches the lactate threshold7.

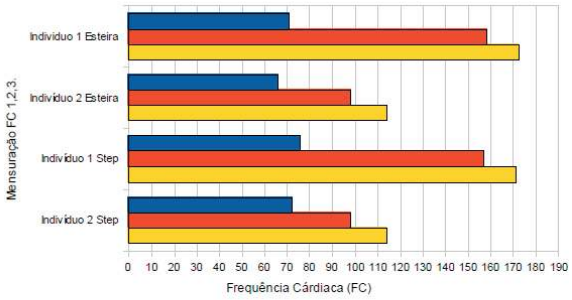
Lactate collections were held at the end of each stage and for control the heart rate was monitored every second, because it was used as a reference to the collection of lactate in the class of step.

In the class of step, we had the lactate threshold heart rate as a basis. When he arrived to that, we collected a drop of blood to measure the lactate quantity present, being that the data were compared with those obtained in the treadmill test.

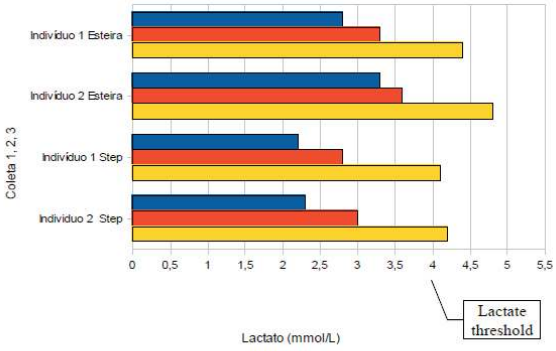
STATISTICS ANALYZIS

After collection, the data was plotted and analyzed through a descriptive comparison and the T test with value of significance $P < 0.05$ between lactate and the heart rate threshold of the treadmill protocol against the step class.

RESULTS



Graphic 1: Heart rate of both individuals during controlled activities.



Graph 2: Lactate threshold of both individuals during controlled activities.

ARGUMENTS

In chart 1, the heart rate was measured both in the treadmill and in step activities. The results of this data show that a large difference between the individual 1 and the individual 2 was found, where the first demonstrated a high heart rate during the collections and the second maintained a low heart rate at all stages.

Chart 2 presents the collections held to find the point of lactate threshold at both activities, being that in the treadmill, the individuals presented higher lactate threshold in first, second and third collection, whereas in step activity the results of lactate were below the control activity.

The first collection of lactate from the individuals practicing step occurred when the individuals were at rest and it showed little difference between both. The second was held as the heart rate found in the control activity, but it happened to be similar in both individuals at three minutes and with little difference to the result collection of lactate. The third and final collection was made for the heart rate control test and presented the same similarity of the second collection, because they happened at eight minutes for both individuals without a significant difference of lactate threshold achieved.

To analyze the significance of this study and the results which were presented we used the T test, where we prove that this study has not had a significant difference between the exercises performed. In individual 1, the T test presented the p value < 0.27 and individual 2 P < 0.18 for lactate values and heart rate values were P < 0.49 for individual 1 and P < 0.45 for individual 2.

Aimed at reaching the point of lactate threshold in step activity which is when the lactate is accumulated into the bloodstream, above the values measured at rest, or even, as being the intensity of the exercise that the concentration of lactate becomes to increase, abruptly 8, 9 The collections just mentioned above were made and demonstrated the point of lactate threshold above 4mmol/L at eight minutes of exercise.

Blood lactate response to exercise has been used to identify aerobic fitness parameters such as lactate threshold (LT), the individual anaerobic threshold, the minimum and maximum phase of stable lactate. These parameters can be used as a

reference to limitation and control of physical training intensities10. Thus, this article demonstrates the point where the lactate threshold occurs in the activity of step, leaving open the opportunity to further studies on this subject.

CONCLUSION

On this research we found the point of the lactate threshold during step classes and control activity. At the control, the lactate threshold was reached in the third stage of the test and the threshold was found in step at eight minutes and didn't show a significant difference between the collections of individuals during these tests.

Regarding the heart rate, we also did not find a significant difference between treadmill and step tests of individuals, but the heart rate of the individual 1 is higher than the individual 2 in all activities.

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IDENTIFICATION OF LACTATE THRESHOLD IN PARTICIPANTS OF ACTIVITIES AT THE GYM: STEP.

ABSTRACT

The aim of this study was finding the point of lactate threshold taking step lessons and for that were selected female individuals practitioners of this activity, where they were subjected to blood tests on a treadmill control activity in a class of step, thus finding the lactate threshold. After, the data collections were analyzed and explained through graphics.

KEYWORDS: Lactate; Lactate Threshold; Heart Rate; Step; Treadmill.

RÉSUMÉ

L'objectif de ce travail est répondre quel le seuil du lactate dans un cours de step. Femmes qui pratiquént cette activité ont été selectioneés , elles ont été soumettre a prélèvements de la sangre dans une activité controle de tapis roulant et aussi dans un cours de step, lesquels ont été trouvées le seuil du lactate. Après lês prélèvements, lês resultáts ont été analisés et expliques par les graphiques.

MOTS-CLÉS: Lactate, Seuil du lactate, Fréquence-cardiaque, Step, Tapis roulant.

RESUMEN

El objetivo de este estudio fue responder cual es el punto del umbral de lactato en aulas de step y para eso fueron seleccionados individuos de sexo femenino practicantes de esa actividad, que fueron sometidos a colectas de sangre en una actividad control de cinta y en un aula de step siendo así encontrado el umbral de lactato. Después de las colectas los datos fueron analizados y explicados a través de gráficos.

PALABRAS CLAVE: Lactato; Umbral de Lactato; Frecuencia Cardíaca; Step; Cinta.

IDENTIFICAÇÃO DO LIMIAR DE LACTATO EM PARTICIPANTES DE ATIVIDADES NA ACADEMIA: STEP.

RESUMO

O objetivo desse estudo foi responder qual ponto do limiar de lactato em aulas de step e pra isso foram selecionados indivíduos do sexo feminino praticantes dessa atividade, onde foram submetidos a coletas de sangue em uma atividade controle de esteira e em uma aula de step sendo assim encontrado o limiar de lactato. Após as coletas os dados foram analisados e explicados através de gráficos.

PALAVRAS CHAVE: Lactato; Limiar de Lactato; Freqüência Cardíaca; Step; Esteira.