21 - EFFECT OF TRAINING PLIOMETRIC IN SANSHOU PRACTITIONERS

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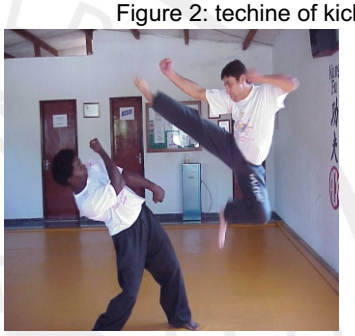
INTRODUCTION

It sanshou it is a combat modality where the muscle power is essential, being necessary the use of specific training that can propitiate an increase in the performance of the practitioners of this modality. By means of the displayed o above, this study it is of great relevance for the physical professors, technician, trainers and athlete of this modality, therefore it has for objective to argue the effect of the pliométric training on the intermediate practitioners of this modality, being verified its application as half of specific neuro-muscle training. For the accomplishment of this study, two groups with 12 individuals had been formed each, being one of the feminine sex in each group. The two groups had been submitted the tests of power of uppers and lowers members, establishing average for the two groups. In the sequence these groups had been subjected the eight weeks of training, being the group submitted to the pliométric training and group B to the resistance training and force with the weight of the proper body. To the ending of the eight weeks, the groups had been submitted to the same tests, establishing new averages and comparing the results, where he was evidenced the superiority of the pliométric training, that besides in such a way increasing the power of how much inferior the upper members, still presented its results in a upper speed that one that other training could present, adding to this its low cost and its easy application.

Figure 1: techine of punch

Figure 2: techine of kick



THE PLIOMETRIC TRAINING

The explosive exercises if have become very popular in the porting way, being faced for the professionals in porting training as an important ally in the search for an improvement in the performance of athlete of diverse porting areas. Such exercises promote things among others a bigger neural activation, improving the reply of the muscle in quality (force) and speed (FLECK and KRAEMER, 1999); (BOMPA, 2002); (USHIDA et al, 2003); (SIMÃO, 2003).

Studied since the decade of 1950 the pliométrico training, also CAE call (cliclo of the allonge and shortening), has its direct performance in mechanical and physiological structures, using to advantage the elastic force of the muscle. The studies of this type of training had disclosed the existence of three elements that act in sinergia during its execution, are they:

a) Contrátil element, that is the actina-miosina maquinário,

b) Elastic elements in series, located in the head of miosina and the tendões,

c) Elastic elements in parallel, being they weaveeed them connective of the esqueléticos estriados muscles (MAZZEO, 2002), (HILL, 1950, apud UGRINOWITH and BARBANT, 1998).

Badillo and Ayestarán (2001), cite three types of explosive force in agreement with the above described elements, are they: Explosive force: on to the contraction element, or either, only the machineruy of contraction; Rubber band-explosive force: on to the contraction that involves the contract machinery and if it adds to the elastic elements in series; e reactive rubber band-explosive Force: this last one adds all the elements (contraction and elastic in series and parallel), being the this last (in the vision of these authors) pliometric contraction par excellence.

This interesting method of training is constituted by a cycle of allonge and shortening (CAE), that it must happen in the lesser interval of time between the phases concentrical and eccentric, where the muscle suffers an daily pay-allonge (or daily pay-stretching) before the concentrical action thus storing elastic potential energy and going off the miotactics consequence (DANTAS, 2003); (FLECK and KRAEMER, 1999, apud BRINK and NERY, 2002).

Despite da complex appearance you gave type of contraction, this is used in natural way nas more diverse tasks do day-by-day, such as to walk, to run, to jump among others, where the elastic potential of muscles wide is explored (SAINT; JANEIRA; MAYAN, 1997); (BARNES, 2003). The physiological mechanism of performance of the pliometric training is the increase of "output" motor, in the movements that are preceded by eccentric contractions, followed immediately for vigorous concentrical actions (VRETAROS, 2003). The functioning of the CAE is understood by the following mechanism: The elastic potential of the muscle is used to advantage when a muscle allonge with generation of simultaneous force occurs. During these muscle actions the production of a negative work exists, where part of its energy mechanics is absorbed and stored as elastic potential energy in the elastic elements in series (FARLEY, 1997, apud UGRINOWITH and BARBANTI, 1998). To if passing of the eccentric phase to the concentrical one, quickly the muscle uses this energy increasing the generation of force in the last phase with a lesser metabolic consuming (KOMI, 1986, apud UGRINOWITH and BARBANTI, 1998). However, in case that the ticket of the eccentric phase to the concentrical one will be slow, the elastic potential energy will be wasted in the heat form, if not transformed into kinetic energy (CAVAGNA, 1977, apud UGRINOWITC and BARBANTI, 1998). It is good for remembering that the allonge (or daily pay-stretching), active the muscle spindle, going off the miotatics consequence (that he will be boarded in the next sub-chapter) that is added to the existing contraction already improving the motor reply.

Studies regarding the efficiency mechanics of the CAE disclose that the mechanical income of the concentrical contraction of the CAE is bigger (about 20%) that that one carried through separately. In other words, to carry through a work (concentrical contraction) little oxygen is consumed during the contraction of the CAE of that in the common concentrical contraction, (CAVAGNA, 1965, 1968). The CAE has been wide used for the cited advantages already, and the fact to bring good results in short period of training, or either, in lesser space of time. A practical circumstance that it demonstrates in simple and

objective way the biggest power of the CAE is the following one: If a man carries through a preceded slew of a daily pay-stretching, its jump is generally superior to the jump that does not use such procedure (ASMUSSEN, 1974 apud BADILLO and AYESTARÁN, 2001). Although it has all this scientific basement still is not known as accurately the CAE provokes the improvements in the muscle power (or explosive force), if this occurs for an improvement of the elasticity of the muscle, or for a neural, on facilitation to the miotactics consequence, (BADILLO and AYESTARÁN, 2001).

The summary of the ideas concerning the pliometric training is the following one:

a) The muscles will contract with more force and speed from a daily pay-stretching;

b) How much lesser time to exist between the daily pay-stretching and the concentrical contraction, stronger and efficient will be the same one;

c) Is of extreme importance a previous and adjusted preparation to the pliometric training;

d) The pliometric training results in: * bigger neural stimulation; * the conscription of the majority, and perhaps of all the motor units and its staple fibres of the requested muscle; * transformation of the muscle work in explosive force, (BOMPA, 2004).

MATERIALS And METHODS

The research was carried through in the Institute of kung fu Chinese of Campos of the Goytacazes, (Institute Lee Siu Loong) interior of the State of Rio De Janeiro. For the accomplishment of the tests the practitioners of intermediate level of the Institute in that date had been used all, being this total of 12 (twelve) young practitioners of sanshou, being 2 (two) of the feminine sort and excessively of the masculine sort, with ages between eighteen and twenty eight years. These twelve practitioners of intermediate level had formed two groups, to know: the group has controlled formed for 6 (six) young e the group has tested formed by others 6 (six), being that each group contained an individual of the feminine sort. The majority of these young practitioners already had some type of experience in competitions. The elements of the research have not practised training with extra overloads in the period of eight weeks in average. All practise it sanshou (kickboxing Chinese) three times per week, and the aerobic work and the exercises located with the weight of the proper body are part of the routine of trainings of these practitioners, being these favorable factors, therefore they can supply security to the work, besides annulling the necessity of a previous work of general, previous conditioning to the tests and to the pliométrico training.

For the accomplishment of this study the following materials had been used: Medicice ball of 3 kilos (mark Goal OlímpicoR), metric trena of three meters with precision of millimeters (GiantR mark), ribbon crepe, chair, rope and chalk. The test consists of mensurar the explosive force of upper and lower members of the practitioners, through it I hurl of medicine ball, and the horizontal jump (JOHNSON and NELSON, 1979 apud DANTAS, 2003). After the accomplishment of the tests, was carried through the statistical treatment (the strategy used statistics was descriptive statistics with application of arithmetic mean and percentages) of the data having found the average of the two groups, which will respectively be called group (group has tested) and group B (control). The group was submitted It to the pliometric training during eight weeks, three times per week with exercises for MMSS and MMII, as commentaries and illustrations below:

•Press of arm with strokes of 4 palms x the 10 20 repetitions;

•Press of arm in step (of step for the ground and the ground for step) 4 x the 10 20 repetitions;

•Stand of hand 4 x of 1 the 2 minutes;

•Spider (displacement with the hands and feet from 4 the seated position) x of 1 the 2 minutes;

•Leg-press with jump 4 x the 20 30 repetitions;

•Leg-press deep with jump 4 x the 20 25 repetitions;

•Jump in depth (40 cm) folloied of double flying kick 5 x 20 repetitions. Better agreement to follow some pliométricos exercises will be displayed some figures demonstrating



Group B (control) was submitted to the training resisted with the weight of the proper body, where the isometric will be used in three different angles in the end of each series (before ninety, to the ninety degrees and after the ninety degrees). After the ending of the eight weeks the tests had been applied again, keeping the same characteristics with the objective to keep the fidedignidade of the same ones.

With the objective to project the training with the maximum effectiveness, the exercises will be period as below:

1ª Week: All the exercises will be carried through according to its lesser amount of repetitions (former press of arm of 10 the 20 repetitions, in the first week only 10 repetitions). Respecting the rest of 1 minute and 30 seconds between the series.

2ª Week: Gradual increase of the repetitions (volume) keeping the same interval between the series (intensity).

3ª Week: It is continued the gradual increase of the repetitions, as the second week.

4ª Week: Identical the second and third week.

5ª Week: It will have a compensation, then, the exercises must be of equal text to the carried through ones in the third week, aiming at to reach the supercompensation.

6ª to 8ª Week: The increase in the amount of the repetitions will continue. This week the repetitions must be superior the reached ones in the fourth week, in case that this number already either the daily pay-established maximum, the increments will have to be taxes in the intensity, or either, the time of rest between the series is diminished of 1 minute and 30 seconds for 1 minute and in the two last weeks of the training this procedure is kept.

RESULTS OF THE TESTS DAILY PAY TRAINING

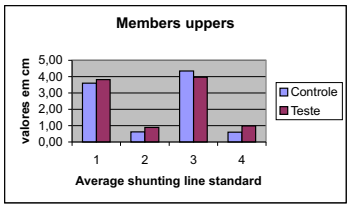
The pictures below demonstrate averages and shunting lines standards of the results of the tests of I hurl of medicine ball and of the horizontal jump, knowing that I hurl it of medicine ball was carried through three times, while the horizontal saint only one attempt. Being thus, below it follows the relation of the results of the tests daily pay and after training:

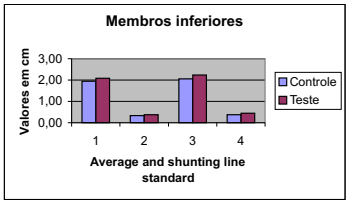
Averages for uppers Members (MMSS)

GROUP	MMSS pay	Desv. Pad.	MMSS after	Desv. Pad.
Control	3,60	0,62	4,35	0,60
Test	3,81	0,89	3,96	0,99

Averages for lowers Members (MMII)

GROUP	MMII Pay	Desv. Pad.	MMII after	Desv. Pad.
Control	1,95	0,33	2,05	0,37
Test	2,09	0,38	2,23	0,44





ANALYSIS OF THE DATA

By means of the data displayed in the previous chapter, it is observed that it did not have significant profit in the power of MMSS from the application of the analyzed training, but only in the MMII such variation was numeric excellent. She is notable who only two individuals of the group had not shown improvement in the MMSS power, in the truth, these had shown to an involution, being they them elements A4 and A5. After the verification of this "fall" of performance, the two elements (A4 and A5), had been questioned on its daily routine, objectifying to find a probable reason for its reduced performance. The two elements had cited one week conturbada in the work environment, having been these professionals of the civil construction. The same ones had told to have been necessary a daily day of 10 the 12 working hours per day, in the week that preceded the re-test. It is possible that this adverse situation has impactuad negative in the results. These results had been: In that it says respect to the MMSS, the group had It a 3,71% improvement, against an improvement of 6,78% for group B. These results suggest little effect positive of the pliometric training, and due to lack of bibliographical material, and to the problem told for the elements A4 and A5, he is dúbio the result in that it refers to to the pliometric training for MMSS.

In that the improvement of 6,46% in the group says respect to the MMII It is indicating positive, however group B showed a 5,14% improvement, that it is a little lesser profit that observed in the group only 1.32% of difference. However it is coherent to remember that in that if relates to the performance any percentage can be a beneficial indicative.

LIMITATIONS OF THE RESEARCH

Diverse variable could not have been controlled, such as the activities extra training, being these, on physical activities to the daily one, between them are domestic work, leisure and tasks. The 0 variable, nutrition and rest after-trainings had also not been controlled. The impossibility to control these 0 variable can have affected in greater or minor instance the results of this research.

CONCLUSIONS and RECOMMENDATIONS

The present work discoursed on the Sanshou (kickiboxing Chinese) and the pliométric training. It was verified and argued the effectiveness of this type of training for the porting modality in question. The research lead this work to the conclusion of that the pliométric training stops the group in question is more effective for MMII, what it corroborates the position of some authors as: Fleck and Kraemer, (1999); Bompa, (2002); among others. However the study it was not favorable to the application of this training for MMSS. The conclusion reached for this study is that the pliométrico training can and must be part of the training of power for intermediate practitioners of Sanshou, being that such training if showed more adequate for the MMII.

All saw is recommendable that other studies can be implemented, aiming at to control other 0 variable and if possible with the use of tests more refined as the electromiografic (BOMPA, 2004), so that if it can better understand the applications, indications, restrictions and results of this fabuloso method of training.

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ABSTRACT

The objective of the study was to investigate two methods of training with the objective to develop the power of lower and upper members in a combat modality where the muscular power is essential, being necessary the use of specific training that can propitiate an increase in the performance of the practitioners of this modality. For the accomplishment of this study, two groups with 06 individuals had been formed each, being one of the feminine sex in each group. The two groups had been submitted the tests of power of superior and lower members (JOHNSON and NELSON, 1979), establishing average for the two groups. In the sequence these groups had been subjected the eight weeks of training, being the group submitted to the pliometric training and group B to the resistance training and force with the weight of the proper body. To the ending of the eight weeks, the groups had been submitted to the same tests, establishing new averages and comparing the results, where he was evidenced the superiority of the pliometric training, that besides in such a way increasing the power of how much lower the upper members, still that one presented its results in a upper speed that other training could present. It was observed estatisticamente that it did not have significant difference between the two methods.

Keywords: Pliometric; Explosive force; Sanshou.

ABSTRAIT

L'objectif de l'étude était d'étudier deux méthodes de formation avec l'objectif pour développer la puissance des membres inférieurs et supérieurs dans une modalité de combat où la puissance musculaire est essentielle, étant nécessaire l'utilisation de la formation spécifique qui peut propitiate une augmentation de l'exécution des praticiens de cette modalité. Pour l'accomplissement de cette étude, deux groupes avec 06 individus avaient été constitués chacun, étant un du sexe féminin dans chaque groupe. Les deux groupes avaient été soumis les essais de la puissance des membres supérieurs et inférieurs (JOHNSON et le NELSON, 1979), établissant la moyenne pour les deux groupes. Dans l'ordre ces groupes avaient été soumis les huit semaines de la formation, étant le groupe soumis à la formation pliometric et le groupe B à la formation de résistance et la force avec le poids du corps approprié. À la fin des huit semaines, les groupes avaient été soumis aux mêmes essais, établissant de nouvelles moyennes et comparant les résultats, où il a été démontré la supériorité de la formation pliometric, qui sans compter que d'une telle manière augmentant la puissance de la façon dont beaucoup inférieur les membres supérieurs, distillateur qu'on a présenté ses résultats dans une vitesse supérieure que l'autre formation pourrait présenter. Il était estatisticamente observé qu'elle n'a pas eu la différence significative entre les deux méthodes.

Mots-clés : Pliometric ; Force explosive ; Sanshou.

EXTRACTO

El objetivo del estudio era investigar dos métodos de entrenamiento con el objetivo para desarrollar la energía de miembros más bajos y superiores en una modalidad del combate donde está esencial la energía muscular, siendo necesaria el uso del entrenamiento específico que puede propitiate un aumento en el funcionamiento de los médicos de esta modalidad. Para la realización de este estudio, habían formado a dos grupos con 06 individuos cada uno, siendo uno del sexo femenino en cada grupo. Habían sometido a los dos grupos las pruebas de la energía de miembros superiores y más bajos (JOHNSON y NELSON, 1979), estableciendo el promedio para los dos grupos. En la secuencia habían sujetado a estos grupos las ocho semanas del entrenamiento, siendo el grupo sometido al entrenamiento pliometric y el grupo B al entrenamiento de la resistencia y fuerza con el peso del cuerpo apropiado. Al conclusión de las ocho semanas, habían sometido a los grupos a las mismas pruebas, estableciendo nuevos promedios y comparando los resultados, donde lo evidenciaron la superioridad del entrenamiento pliometric, que además de tal manera que aumenta la energía de cómo mucho es más bajo los miembros superiores, alambique que uno presentó sus resultados en una velocidad superior que el otro entrenamiento podría presentar. Era estatisticamente observado que no tenía diferencia significativa entre los dos métodos.

Palabras claves: Pliometric; Fuerza explosiva; Sanshou.

RESUMO

O objetivo do estudo foi investigar dois métodos de treinamento com o objetivo de desenvolver a potência de membros inferiores numa modalidade de combate onde a potência muscular é imprescindível, sendo necessária a utilização de treinamentos específicos que possam propiciar um aumento na performance dos praticantes desta modalidade. Para a realização deste estudo, foram formados dois grupos com 06 indivíduos cada, sendo um do sexo feminino em cada grupo. Os dois grupos foram submetidos a testes de potência de membros superiores e inferiores (JOHNSON e NELSON, 1979 apud DANTAS, 2003), estabelecendo médias para os dois grupos. Na seqüência estes grupos foram sujeitados a oito semanas de treinamento, sendo o grupo A submetido ao treinamento pliométrico e o grupo B ao treinamento de resistência e força com o peso do próprio corpo. Ao término das oito semanas, os grupos foram submetidos aos mesmos testes, estabelecendo novas médias e comparando os resultados, onde ficou evidenciado a superioridade do treinamento pliométrico, que além de aumentar a potência tanto dos membros superiores quanto inferiores, ainda apresentou seus resultados em uma velocidade superior aquela que outros treinamento poderiam apresentar. Foi observado estatisticamente que não houve diferença significativa entre os dois métodos.

Palavras chave: Pliometria; Força explosiva; Sanshou.