23 - COMPARISON OF INCREASE IN MUSCLE STRENGTH TRAINING INDVÍDUOS THAT TWO AND THREE TIMES A WEEK, AFTER 16 SESSIONS OF STRENGTH TRAINING.

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INTRODUCTION

Strength training is becoming increasingly popular and this popularity can be attributed to the benefits associated with their practice, including: improving the quality of life and health (Bird et al, 2005; HASS et al, 2001; ACSM , 2003), reduced risk of chronic diseases (HASS et al, 2001), improvement of activities of daily living (SUETTA et al, 2004; Mazzeo and TANAKA, 2001; ACSM, 2003) and treatment of various diseases that dispenses medication use (ACSM, 2003; Mazzeo and Tanaka, 2001). Furthermore, when the exercise prescription is based on the literature, can be practiced by young people, adults and special populations (Mazzeo and TANAKA, 2001; ACSM, 2003; Munn et al, 2005; KRAEMER and Ratamess, 2004; HASS et al, 2001), which also contributes to its popularity. Much of practitioners conducts programs of strength training, aiming to improve the aesthetics, ie, reduce percentage of body fat and increase muscle mass (KRAEMER and Ratamess, 2004).

It is effective for increasing strength, hypertrophy, muscular power and muscular endurance, but depending on the objectives and the differences of each individual prescribing patterns may vary, so give it the name of methodological variables of strength training (ACSM, 2002). A professional attitude and especially as to the expected results of this work, end up being influenced by the way is prepared as a training and control of several variables. Besides life situations of professional practice, these controls are also used in scientific environment to make comparisons between training methods and / or the effect of this on variables such as body composition, thus providing effective parameters in prescribing training loads. Among the variables, highlight the frequency of training (number of times per week) and training load (FLECK and KRAEMER, 1999). These variables were chosen because they represent a reality commonly experienced by many professionals: tailor a routine of physical activity to people who have little time to dispose of this, and that way you can have a control loads during training for students able to get the expected result.

Significant increase in muscle strength occurs due to adaptations aoexercício. During strength training for response to stimuli that occurs, the muscles respond by neural action. The neural adaptation becomes predominant during the initial phases of strength training (Moritani; DeVries, 1979), in which the intermediate and advanced phases of strength training, become the priority muscular adaptations, ie, hypertrophic factors (Moritani ; DeVries, 1979), reducing the neural action in relation to the start of training. In general, these changes occur by the increase in total muscle activation, increase in firing rate and synchronization of motor units, or by reducing the co-activation of antagonistic muscles during exercise (Hakkinen et al, 1998; KOMI, 1986; NARICI et al, 1989), which also leads to an increased training load, mainly due to factors increase the coordination of movements, which directly influences the methodology applied for that moment should be an adjustment in the training load .

According to the positioning of the ACMS (2002) based on a series of reviews of scientific studies, it is reported that strength gains are more relevant during the early stages than in the intermediate and advanced phases of strength training, and some authors conclude that this increase occurs within a 4-8 week training, allowing larger adjustments in training load (O'Bryant et al 1988; Hickson et al, 1994).

Commonly, it is stated that the training loads are adjusted whenever the preset upper limit of repetitions for each exercise was reached in all grades, in order to preserve the initial intensity. This is based on results obtained by applying weight tests (Rodrigues, 1985).

For untrained individuals, weekly frequency recommended by the ACSM (2002) is two to three times per week, and the frequency of three times per week is enough for there to be a significant increase in strength and increase in load progression. Furthermore, studies using the frequency of twice a week, and diverse populations such as children, women and elderly, also show growth strength training in a few weeks (ACMS, 2002; KRAEMER and Ratamess, 2004; BERNHARDT, 2001) . Thus, it is believed that investigations that are able to control these variables in individuals of the same sex, untrained and with similar levels of physical fitness, can promote understanding of the effectiveness of strength training programs and possible behavioral differences between individuals practicing Training two or three times per week in a short time in response to those conditions. Therefore, the objective of this study was to compare the increase in muscle strength in individuals who train two or three times a week, after 16 sessions of strength training.

METHODOLOGY

The study population consisted of 10 male subjects were divided into two groups: Group 1 (G2X) that exercise performed twice per week, the second group (G3X) in which trained three times a week, both with the same training volume Weekly. In order to meet the criteria for inclusion in the study, all participants have the following characteristics: a) did not perform strength training for at least one year before the start of the study, b) did not perform any other type of regular physical activity during the study c) showed no functional limitation for strength training or the performance of the tests involved in the study, d) did not use any type of nutritional supplementation. Exclusion criteria were: a) individuals who, after the test are considered statistical outliers for strength testing and b) less than 80% attendance to the training program. The load was determined from the test 10RM (repetition maximum) in the bench press and leg press exercises. The training program for all groups (G2x and G3X) was in the following order: bench press, leg press, pull, leg extension, development, leg curl, biceps, abdominal and triceps. The G2x held three series with moderate (8 to 12 repetitions) in each year group and G3X two series with the same intensity group G2x with both the load found in the 10RM test. During the sessions, participants were verbally encouraged to perform all sets to concentric failure, and the same definitions of full range of motion used during the 10RM tests will be used to define a repeat as successful. The training load was increased when the individual was able to perform more than the prescribed number of repetitions (12 repetitions) in two training sessions in all sets of each exercise. Before each training session, participants performed a specific warm-up, consisting of 10 repetitions with

approximately 50% of the load used in the first year of the training session. Data were described with measures of central tendency and dispersion (mean and standard deviation). Normality was checked by Shapiro Wilk. For comparison of MS and MI between different weekly frequencies in the pre and post applied a test t-student for dependent samples. However, the post between the two frequencies for MS and MI was applied a T-student test for independent samples. The α level was 0.05. All analyzes were done using SPSS 14.0 for Windows ®. The evolution of the periods between training was verified by size effect proposed by Rhea (2004).

RESULTS

The behavior of increased muscle strength for upper and lower limbs in the pre and post 16 training sessions between the groups is presented in Table 1. Significant difference in the pre and post training in relation to the increase in muscle strength, except for the lower limb in training frequency of three times a week.

Table 1 - Behavior of increased muscular strength in relation to weekly training (2 and 3 times per week) in the pre and post for upper and lower limbs. Mean and standard deviation.

Frequency		Upper limb	p	Lower limb	p
2x	Pré	49,35±21,21	0,02	426,78±103,99	0,006
	Pós	57,88±18,22		528,14±66,95	
Effect Size		0,40 (trivial)		0,97 (small)	
3x	Pré	33,68±13,66	0,01	480,13±164,43	0,09
	Pós	45,01±15,34		550,15±88,05	
Effect Size		0,83 (small)		0,43 (trivial)	

There was no significant difference when comparing the post between the frequencies (2x and 3x) for the upper limb (p = 0.341) and lower (0.555).

DISCUSSION

The progressive increase of the load, in untrained individuals in the early stages of TF, is due to neural adaptations, as well as literature already points (Moritani; DeVries, 1979). This was expected as was pointed out in the above results. Strength training has distinct stages. Occur early in training neural adaptations essential for strength gains, but without adequate increase in muscle mass. Increases in increased load and strength in a short period of time are already found in the literature (Hunter, 1985; LEMMER et al, 2000; Staron et al, 1994; WILMORE, 1974). Dias et al (2005) compared men and women for eight weeks of training using force (TF) at the frequency of three times a week. Despite the difference between the genders, the increase in strength was evident in both sexes, when used a short time. Hunter (1985) found a 11.9% increase in strength in men over a period of 10 weeks with TF. Wilmore (1974) reported increases of 28.6% in men exercise bench press at the same time. There could be even more significant changes during the 16 sessions in increasing the strength of this study. It was seen that there was a change in the lower limbs of individuals who trained three times when comparing the pre and post workout, probably due to the short time of the study. Similar situations were clearly outlined in a study by Coutts et al (2007) where he advocates the importance of testing and load controls for achieving the objectives. It should be emphasized that the progressive strength training is essentially necessary to develop improvements in the synchronization of motor units, therefore, better activation of motoneurons, so that if there is an increase in strength (Carroll et al, 2001). Regarding the relationship between frequency of training, Holly et al (2003) noted that there was no difference compared groups who train three times a week to only two groups who trained. This study was conducted with children (males) and lasted for eight weeks. They also highlight the increased load and strength, and similar to our study.

But stressed that comparisons between groups are little influenced by the duration of the study. In the aforementioned study in which Dias et al (2005) compares an increase of power between men and women, women showed greater strength development, the authors state that for women, the strength increase could be significant even with the decrease the weekly frequency. Therefore, it is supposed that, if an increase of both sexes, results in increasing strength for men, even lower than women, it would be too, if they would train at a lower frequency.

Trancoso and Farinatti (2002) found excellent results using frequencies in small weeks old, stating that the results obtained are sufficient for the improvements that TF offers. Although this study reported that the results can be compared to younger populations.

Harris et al (2003) found no differences in the results of a study which compared the levels of increased load and training intensity in older individuals who train two, three or four times per week. The most prominent study done with the concern of investigating the influence of the variable 'weekly' gain in muscle strength in older adults was conducted by Taaffe et al (1999), in which the authors evaluated 53 subjects, divided into groups that trained a once per week, twice, three times and the latter being the control. It was seen that there was no difference between groups, and the study was conducted over a period of 24 weeks.

CONCLUSION

The results of this study indicated that there were no changes in the progression load in individuals who use the TF at a frequency of twice weekly compared to those who train three times. We assume that a decrease in the weekly frequency, due to the fact experienced by many students can bring the same beneficial results as compared training with higher frequencies. We believe that the short duration of the study and the sample size were factors that may have contributed to results, thus, suggest that more studies be conducted with larger numbers of subjects and prolonged training period.

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COMPARISON OF INCREASE IN MUSCLE STRENGTH TRAINING INDVÍDUOS THAT TWO AND THREE TIMES A WEEK, AFTER 16 SESSIONS OF STRENGTH TRAINING.

ABSTRACT

Strength training is now seen as an important means to achieve significant gains in strength. It is known that various benefits can be achieved with training, but it is seen that many do not have the time to practice guided by the minimum current literature. Using the justification that some individuals could decrease the weekly practice sessions, the objectives of the present study was to was to increase the strength in individuals who train two or three times a week, after 16 sessions of strength training. For this study, 10 subjects were evaluated males untrained divided into two groups: Group 1 (G2X) that exercise performed twice per week, the second group (G3X) in which trained three times a week, both with the same weekly training volume. Tests were applied to define and load the subjects followed a training program. The exercises were chosen bench press, leg press, pull, leg extension, development, leg curl, biceps, abdominal and triceps. The evaluation was done only in bench press and leg press

exercises. Describing data with measures of central tendency and dispersion, it was seen that there were no changes between groups. It was concluded that probably there was no differences between those who train only twice per week and who train three times. Thus we assume that there might be a fitness training, using short training frequencies to achieve the same results in higher frequencies.

KEYWORDS: strength training, untrained individuals, Weekly frequency.

COMPARAISON DE L'AUGMENTATION DE LA FORMATION LA FORCE MUSCULAIRE INDVÍDUOS QUE DEUX ET TROIS FOIS PAR SEMAINE, APRES 16 SEANCES DE MUSCULATION

RÉSUMÉ

La musculation est désormais considérée comme un moyen important de réaliser des gains significatifs en force. Il est notoire que les avantages divers peuvent être réalisés avec la formation, mais on voit que beaucoup n'ont pas le temps de pratiquer inspiré par la documentation minimale actuelle. Utilisation de la justification que certaines personnes pourraient diminuer les séances d'entraînement hebdomadaires, les objectifs de la présente étude était de était d'augmenter la résistance chez les personnes qui s'entraînent deux ou trois fois par semaine, après 16 séances de musculation. Pour cette étude, 10 sujets ont été évalués hommes non entraînés divisés en deux groupes: Groupe 1 (G2X) que l'exercice effectué deux fois par semaine, le deuxième groupe (G3X) dans laquelle formé trois fois par semaine, à la fois avec le même volume d'entraînement hebdomadaire. Des tests ont été appliquées pour définir et charger les sujets ont suivi un programme de formation. Les exercices ont été choisis bench press, presse jambes, traction, extension des jambes, le développement, la flexion des jambes, biceps, triceps et abdominale. L'évaluation a été faite uniquement en développé couché et exercices presse jambes. Description des données avec des mesures de tendance centrale et de dispersion, on a vu qu'il n'y avait pas de changements entre les groupes. Il a été conclu que, probablement, il n'y avait pas de différences entre ceux qui s'entraînent que deux fois par semaine et qui s'entraînent trois fois. Ainsi, nous supposons qu'il pourrait y avoir une formation de remise en forme, utilisant des fréquences formation de courte durée pour atteindre les mêmes résultats dans des fréquences plus élevées.

MOTS-CLÉS entrenamiento de la fuerza, les individus entrenados à eux, il frecuencia hebdomadaire.

COMPARACIÓN DE AUMENTO EN EL ENTRENAMIENTO MUSCULAR QUE LA FUERZA INDVÍDUOS DOS Y TRES VECES POR SEMANA, DESPUÉS DE 16 SESIONES DE ENTRENAMIENTO DE FUERZA.

RESUMEN

El entrenamiento de fuerza es visto ahora como un medio importante para lograr avances significativos en la fuerza. Se sabe que diversos beneficios se puede lograr con el entrenamiento, pero se ha visto que muchos no tienen el tiempo para practicar guiado por la literatura actual mínimo. Con la justificación de que algunos individuos podrían disminuir las sesiones de entrenamientos semanales, los objetivos del presente estudio fue era aumentar la fuerza en individuos que entrenan dos o tres veces por semana, después de 16 sesiones de entrenamiento de fuerza. Para este estudio, 10 sujetos fueron evaluados hombres desentrenados divididos en dos grupos: Grupo 1 (G2X) que el ejercicio realizado dos veces por semana, el segundo grupo (G3X) en la que entrenado tres veces a la semana, ambos con la misma el volumen de entrenamiento semanal. Las pruebas se aplicaron a definir y cargar los sujetos siguieron un programa de entrenamiento. Los ejercicios fueron elegidos press de banca, press de piernas, pull, extensión de piernas, desarrollo, curl de piernas, bíceps, tríceps y abdominales. La evaluación fue realizada solamente en press de banca y prensa de piernas ejercicios. Descripción de datos con medidas de tendencia central y dispersión, se observó que no hubo cambios entre los grupos. Se concluyó que, probablemente, no hubo diferencias entre los que entrenan dos veces por semana y que entrenan tres veces. Así, suponemos que puede haber un entrenamiento físico, utilizando frecuencias de formación de corta duración para lograr los mismos resultados en las frecuencias más altas.

PALABRAS CLAVE: entrenamiento de la fuerza, los individuos no entrenados, la frecuencia semanal.

COMPARAÇÃO DO AUMENTO DE FORÇA MUSCULAR EM INDVÍDUOS QUE TREINAM DUAS E TRÊS VEZES POR SEMANA, APÓS 16 SESSÕES DE TREINAMENTO DE FORÇA.

RESUMO

O treinamento de força hoje é visto como um importante meio para se obter ganhos significativos de força. Já se sabe que diversos benefícios podem ser alcançados com o treinamento, porém vê-se que muitos não dispõem de tempo para a prática mínima orientada pela atual literatura. Utilizando a justificativa que alguns indivíduos poderiam diminuir as sessões de treinos semanais, o objetivos do presente estudo foi o de foi o aumento da força em indivíduos que treinam duas e três vezes por semana, após 16 sessões de treinamento de força. Para este estudo, foram avaliados 10 sujeitos do sexo masculino, destreinados, divididos em dois grupos: Grupo 1 (G2X) que realizou exercício duas vezes por semana, o segundo grupo (G3X) no qual treinou três vezes por semana, ambos com o mesmo volume de treinamento semanal. Foram aplicados os testes para definição de carga e os indivíduos seguiram um programa de treinamento. Os exercícios escolhidos foram supino, leg press, puxada, cadeira extensora, desenvolvimento, cadeira flexora, rosca bíceps, abdominal e rosca tríceps. A avaliação foi feita somente nos exercícios supino e leg press. Descrevendo os dados com valores de tendência central e dispersão, foi visto que não houve alterações entre os grupos. Concluiu-se que provavelmente não existiu diferenças entre aqueles que treinam somente duas vezes por semana e os que treinam três vezes. Supomos que com isso, possa haver uma adequação do treinamento, utilizando curtas frequências de treino a fim de alcançar os mesmo resultados de frequências maiores.

PALAVRA- CHAVE: Treinamento de força, Indivíduos destreinados, Frequência semanal.