176 - THE INFLUENCE OF TRAINING OF FORCE IN QUADRICEPS MUSCLE TO WALK THE ELDERLY

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INTRODUCTION

It is known that the rates epidemiological related to aging are growing worldwide. It is indeed remarkable that the number of elderly is increasing in all states of Brazil, in Alagoas is no different, according to data obtained by the State Health Secretary of Alagoas - SESAU-AL (2006), the percentage of elderly is 8.5 % Of the population, which shows the large number of individuals this age in our state. Estimates for the United Nations Fund for Population show that in 2050, life expectancy in developing countries ¬ involved will be approximately 87.5 years for men and 92.5 years for women (compared with 70.6 and 78, 4 years in 1998), whereas in developing countries, will be of 82 years for men and 86 for women, representing 21 years to more than today, which is 62.1 and 65.2 years respectively. (DIAS, 2006).

As human beings age, their muscle mass decreases, becoming more fragile and creates instability, loss of functional capacity, partial or complete loss of independence (difficulty in performing the tasks of day-to-day) and, most importantly, increased risk of falls, a major cause of accidents in old age (LAMBERTUCCI, 2005).

In elderly patients, there is some reduction in the number of motor units (approximately 47%). For Barbosa (2007), the lowest total muscle size, loss of quantity and quality of contractile proteins, gradual loss of motoneurons, and physical inactivity are also factors related to the decline in muscle strength, started around 50 years.

According Raso (2000) in recent years, has also been ranked the localized muscular endurance and muscular strength (in addition to body composition, cardiorespiratory endurance and flexibility) and physical components related to health, and then, especially after half of this decade both have been prioritized in training programs, especially for the elderly, where the American College of Sports Medicine categorizes the muscular strength as the key variable of physical fitness linked to health to be stimulated during the aging process.

In a study by Fiatarone (1990), about the effects of exercise therapy in elderly subjects, were recruited in December elderly, with an average age of 90 years who were undergoing a program of muscle strengthening high-intensity, for 8 weeks, with in the first week were used 50% of maximum resistance (MR) and in subsequent weeks 80% of MRI. The protocol included concentric and eccentric exercises performed in 3 sets of 8 repetitions, 3 times a week. There was an average increase of 174% in the strength of quadriceps, after the 8 weeks of training, which was due both to hypertrophy of the muscle on the improvement of neural recruitment.

The two best-known parameters for the control and limitation of exercise are the muscular strength of test repetition maximum (RM), which aims to measure the maximum number of repetitions that an individual can play with a certain overload and test load (1 -RM) in which the individual must perform a single repetition with the maximum possible weight (RASO, 2000).

For Castro (2000), the speed of movement is considered as the single parameter that best represents the performance of the same. From the second half of the sixth decade of life, begins to experience a decline in the speed of the march, a reduction of the length of the step and cadence, and disturbance of coordination between the upper and lower limbs.

The quadriceps is formed by four bodies muscle, the femoral rectus, the medial wide, the wide side and wide intermediate, is a large and powerful muscle. It is known that a quadriceps with impaired function favors the instability of the knee, the same stability that is needed to activities such as walking and climbing stairs.

The physiotherapy treatment most often occurs in 10 sessions, the elderly often have difficulties in their motion that impossible to achieve certain functional activities, such as AVD'se the AIVD's. In the School of Physiotherapy of UNCISAL, the senior reaches of care and left most of the time without strengthening the muscles used during the march.

That is why this study is the need to know if in 10 sessions of treatment of gerontological rehabilitation can be achieved sufficient strength in quadriceps muscle that manages to influence the march of the elderly.

METHOD

This work is a case study that the second Padua (1994), is a way to collect data, preserving the unitary character of the "object" to be studied. The case study can not be considered a methodological feature that performs the analysis of the object of the search throughout its unity, but it is an attempt to cover the most important features of the subject that is searching.

SUBJECT

Study participants were three women older with an average age of 65 years, were established as a criterion for inclusion in the study, the elderly of both sexes, with more than 60 years of age without cognitive impairment, neurological, without compromising large rheumatology, orthopedic prevent them ramble and not make use of auxiliaries for the march as canes, crutches and walkers.

PROCEDURES

Initially for the participants were informed of all search procedures, and test protocols that would be used, but also the purpose of the study. It was subsequently read and signed the Statement of Free and Informed Consent (FICT).

Participants in the study went through an evaluation of the quadriceps muscle to verify the strength of this muscle. The test of muscle strength is done with the elderly sitting in a chair, calls for him to extend his leg while the evaluator causes a resistance with the hand against the motion. If the individual can not overcome the resistance it is calling for withdrawal to the individual to perform the movement once more, if the individual still unable to perform the movement he places himself in the lateral position (DL), to avoid action the severity, and to apply again the resistance against the range of motion.

It was conducted after a test of physical performance (TPF), which investigated the ADL's the motion regarding the individuals involved in the search. The test consists of tasks for assessing the speed of implementation of them, where the marking of time was turned into points. This instrument has been modified to Rebellato (2004) and validated by the Research

Ethics Committee of the UNCISAL.

Then there was the maximum load for extension of knees, as the test of 1-RM (one repetition maximum) in the extensor chair. As a way of preparation, was allowed to run a series of measured five to ten repetitions of the exercise without overload, with only the weight of the chair arm extension. Then, it is the test, which involved a maximum of six attempts, with an interval of 2 minutes between them. Subjects were discouraged from performing the Valsalva maneuver and should inspire before you perform the movement, expires during the positive phase (concentric) and inspire again when the weight is returning to the starting position (eccentric), the second protocol suggested by (FARINATTI, 2004).

After this step, the protocol was performed resistance training during the December meetings. The load used for the training protocol was 50% of the outcome of 1-RM as the protocol used by (RASO; Matsuda, 2001). The protocol was as follows: the first two sessions were done with load of 50% of the 1-RM, and held two rounds of 10 to 12 repetitions. The two sessions following an additional 2 pounds in the cargo being kept the number of sets and repetitions. In the 5th, 6th and 7th sessions the cargo was kept being raised to three the number of runs, while the number of repetitions. The last three sessions there was an increase of over two kilos in charge while the number of three series and the number of repetitions.

The protocol was carried out 2 times during the week without it occurs is no lack of volunteers. It was used in the study chair a unilateral extension and washers, 2, 3, 4 and 5 pounds.

At the end of the sessions was used again the physical performance test for obtaining data.

TABLE 1

Physical Performance Test (TPF) - Schedule scores

ACTIVITY / TASK	PERFORMANCE TEST OF PHYSICS		
	TIMES (s)	STANDINGS	POINTS
1. Take a bit on the floor		**d 2 s = 4 points** **2,5 a 4 s = 3** **4,5 a 6 s = 2** **> 6 s = 1** Unable **= 0**	
2. Rotate 360ÿ		discontinuous steps **= 0** Continuous steps **= 2** Insecure **= 0** Safe **= 2**	
3. Walking 15.2 meters		**d 15 s = 4 points** **15,5 a 20 s = 3** **20,5 a 25 s = 2** **> 25 s = 1** **Unable = 0**	
4. Up one step from ladder		**d 5 s = 4 points** **5,5 a 10 s = 3** **10,5 a 15 s = 2** **> 15 s = 1** **Unable= 0**	
5. Climbing stairs	Number of steps - ascent and descent (maximum 4)		

Total score (maximum 20)

RESULTS

Results of T.P.F. by activity before and after the protocol-building (in points)

TABLE 2

Voluntary	**Activity 1**	
	Before	After
1	3	4
2	3	4
3	3	4

You can check in the table above that for the first activity, before the protocol-building, the three volunteers took more than 2.5 seconds and less than 4 seconds to perform the movement, gaining 3 points (the conversion of the second test). After strengthening the three performed the same motion in less than 2 seconds, thereby increasing by 25% the efficiency of motion.

TABLE 3

Voluntary	**Activity 2**	
	Before	After
1	4	4
2	2	4
3	4	4

Table 3, the volunteers 1 and 3 won the maximum score in the realization of activity before the building, then repeating the same scores therefore not have any gain. Already a voluntary 2, had 2 points as before and 4 after taking a 50% gain in efficiency in the movement.

TABLE 4

Voluntary	**Activity 3**	
	Before	After
1	3	3
2	3	4
3	3	4

Analyzing the data in table 4, we note that the three volunteers had 3 points before the strengthening of the quadriceps muscle and only a voluntary 1 maintained that score then, did not gain any. The voluntary 2 and 3 had a gain of 25% efficiency in the movement.

TABLE 5

Voluntary	**Activity 4**	
	Before	After
1	3	4
2	4	4
3	4	4

Table 5, the volunteers 2 and 3 gained maximum score in the conduct of activities before the building, then repeating the same scores therefore not have any gain. Already a voluntary 1, returned 3 as scores before and 4 after taking a 25% gain in

efficiency of motion.

TABLE 6

Voluntary	Activity 5	
	Before	After
1	3	4
2	4	4
3	4	4

In analyzing the table 6, we see that the volunteers 2 and 3 gained maximum score in the conduct of activities before the building, then repeating the same scores therefore not have any gain. Already a voluntary 1, returned 3 as scores before and 4 after taking a 25% gain in efficiency of motion.

Results of the total points of T.P.F. before and after the protocol-building

TABLE 7

Voluntary	Total points	
	Before	After
1	16	19
2	18	20
3	19	20

We note in Table 7 that the voluntary 1 before strengthening returned 16 points in total and then rose to 19, thus getting 15% gain in efficiency in his movements. The voluntary 2 earned 18 points before and rose to 20 (maximum score of the test), thus obtaining a 10% gain in efficiency of their movements. The voluntary 3 returned 19 points before and 20 after the building, getting a 5% gain in efficiency of the movements that have been made.

FINAL CONSIDERATIONS

Strength is the ability that has the muscle to generate tension and with that win a certain resistance. To strengthen the quadriceps muscle are giving greater stability and security to the elderly to perform their duties in a more independent. It was because in some activities held there was a gain of up to 50% efficiency in the movement in a particular task and in general managed to improve by 15% in the march and consequently the functional capacity of the elderly. When comparing the before and after it became clear strengthening of the gain in efficiency in making the move. This becomes even more clear to look at the score made before and after the voluntary 1. It is results that strengthening the quadriceps directly influences the movement of the elderly and it is possible to achieve a gain of strength in elderly people during a treatment of physical rehabilitation in 10 sessions. We also believe it is only possible with dedication, diligence and trust between therapist and patient. At the end of the study were asked to volunteer if they felt improvement on their march and the three reported feeling more secure and confident in the performance of some ADL's after the strengthening of the quadriceps muscle. All volunteers in the study showed improvement in speed of walking, climbing stairs and perform daily tasks, reaching back its "independence".

This study was a clinical trial and had no desire to be a decisive and comprehensive study on the subject, but through it we can see that you can add the sessions of physiotherapy for the elderly a little more muscle-building to improve quality of life among the elderly. This study opens up new possibilities in the field of rehabilitation and training of strength in the elderly in short periods of time.

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THE INFLUENCE OF TRAINING OF FORCE IN QUADRICEPS MUSCLE TO WALK THE ELDERLY

ABSTRACT

A key aspect to reducing the mobility and the consequent decline in functional ability of elderly people is the commitment of the march. The lack of walking or even walking difficult precarious in the main activities of daily living (ADL's) of the elderly. This study aimed at strengthening the main check whether quadriceps muscle during 10 sessions, directly influence the movement of the elderly. The research is characterized as a case study, which were selected 3 elderly who are in physiotherapy treatment at the University of Alabama Health Sciences (UNCISAL). After clarification and the signing of the Term of Free and Informed Consent (FICT), was found the strength, the motion related to AVD'se measured the load to strengthen the quadriceps. It was found that there was a general gain in all the study volunteers for the efficient implementation of some activities, with gains of up to 50% on an isolated activity. All volunteers showed improvement in speed of walking, climbing stairs and carry terefas daily. It was concluded that strengthening the quadriceps directly influences the movement of the elderly by making it more independent in carrying out some everyday tasks.

Keywords: Strength, March, Elderly.

L'INFLUENCE DE LA FORMATION DE FORCE DANS MUSCLE QUADRICEPS À PIED LES PERSONNES ÂGÉES

RÉSUMÉ

Un aspect essentiel à la réduction de la mobilité et de la baisse de la capacité fonctionnelle des personnes âgées est l'engagement de l'mars. L'absence de marche à pied ou même difficile précaire dans les principales activités de la vie quotidienne (ADL's) des personnes âgées. Cette étude vise à renforcer les principaux vérifier si le muscle quadriceps au cours de 10 séances, une influence directe sur le mouvement des personnes âgées. La recherche est caractérisée comme une étude de cas, qui ont été sélectionné 3 personnes âgées qui sont en traitement de physiothérapie à l'Université de l'Alabama des sciences de la santé (UNCISAL). Après clarification et la signature de la durée du consentement libre et éclairé (FICT), a été trouvé la force, la motion liés à AVD'se mesuré la charge de renforcer le quadriceps. Il a été constaté qu'il y avait une gain de tous les volontaires pour la mise en œuvre efficace de certaines activités, avec des gains pouvant aller jusqu'à 50% sur une activité isolée. Tous les bénévoles ont montré l'amélioration de la vitesse de marche à pied, monter les escaliers et porter terefas quotidien. Il a été conclu que le renforcement du quadriceps influe directement sur le mouvement des personnes âgées en les rendant plus indépendants dans l'accomplissement de certaines tâches quotidiennes.

Mots-clés: Résistance, Mars, personnes âgées.

LA INFLUENCIA DE ENTRENAMIENTO DE LA FUERZA EN MÚSCULO CUADRICEPS A CAMINAR PERSONAS DE LA TERCERA EDAD

RESUMEN

Un aspecto clave para la reducción de la movilidad y la consiguiente disminución de la capacidad funcional de las personas de edad es el compromiso de la marcha. La falta de pie o incluso caminando difícil precaria en las principales actividades de la vida diaria (ADL'S) de las personas de edad avanzada. Este estudio tiene como objetivo principal el fortalecimiento de comprobar si el músculo cuadriceps durante 10 períodos de sesiones, influyen directamente en la circulación de las personas de edad avanzada. La investigación se caracteriza como un estudio de caso, que fueron seleccionados 3 ancianos que se encuentran en tratamiento de fisioterapia en la Universidad de Alabama en Ciencias de la Salud (UNCISAL). Después de la aclaración y la firma del plazo de consentimiento libre e informado (FICT), fue encontrado la fuerza, la moción relacionada con AVD'se mide la carga para fortalecer el cuadriceps. Se constató que hubo una ganancia general en todos los voluntarios de estudio para la aplicación eficaz de algunas actividades, con ganancias de hasta un 50% sobre una actividad aislada. Todos los voluntarios mostró mejora en la velocidad de caminar, subir escaleras y llevar terefas diario. Se llegó a la conclusión de que el fortalecimiento de los cuádriceps influye directamente en la circulación de las personas de edad avanzada por lo que hace más independiente en la realización de algunas tareas cotidianas.

Palabras clave: Resistencia, de marzo, de edad avanzada.

A INFLUÊNCIA DO TREINAMENTO DE FORÇA NO MÚSCULO QUADRÍCEPS PARA A MARCHA DO IDOSO

RESUMO

Um dos principais aspectos para a diminuição da mobilidade e conseqüente diminuição da capacidade funcional dos idosos é o comprometimento da marcha. A falta de deambulação ou mesmo a deambulação precária dificulta nas principais Atividades da Vida Diária (AVD's) dos idosos. Este estudo tem como objetivo principal verificar se fortalecendo o músculo quadríceps durante 10 sessões, influenciará diretamente na marcha do idoso. A pesquisa se caracteriza como um estudo de caso, onde foram selecionados 3 idosas que encontram-se em tratamento fisioterápico na Universidade de Ciências da Saúde Alagoas (UNCISAL). Após o esclarecimento e a assinatura do Termo de Consentimento Livre e Esclarecido (TCLE), foi verificada a força, a marcha relacionada as AVD's e mensurado a carga para fortalecimento do quadríceps. Foi verificado que houve um ganho geral em todas as voluntárias do estudo em relação a eficiência na execução de algumas atividades, tendo ganhos de até 50% em uma atividade isolada. Todas as voluntárias apresentaram melhora na velocidade de andar, subir escadas e realizar terefas cotidianas. Concluiu-se que o fortalecimento do quadríceps influencia diretamente na marcha do idoso tornando-o mais independente na realização de algumas tarefas diárias.

Palavras-chave: Força, Marcha, Idoso.