58 - CORRELATION BETWEEN STRENGTH AND HOLD PALM PERFORMANCE TEST TIMED UP AND GO IN ELDERLY INSTITUTIONALIZED

MARCOS ALEXANDRO MÜLLER;
DIOGO FANFA BORDIN;
JULIANO RODRIGUES ADOLFO;
MIRIAM BEATRIZ FROEMMING
Universidade de Santa Cruz do Sul, Santa Cruz do Sul, Rio Grande do Sul, Brasil
marcosfisio74@gmail.com

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INTRODUCTION

In recent decades, the world population scenario has been characterized by population aging. As a contribution to this phenomenon, Brazil has experienced one of the fastest growing elderly population. Besides the increase in the number of elderly, there has been significant increase in the life expectancy of the population. This, it was around 33.7 years in 1950/1955, went to 50.99 in 1990, 66.25 in 1995 reached 71.7 years in 2004 and 73.5 years in 2010 (ALENCAR et al 2012).

According to data from the last census, conducted ten years ago, the number of seniors was 14.5 million (8% of the total population). Today, Brazil has 18 million people over 60 years of age, which already represents 12% of the population. The participation of the band with more than 65 years increased from 5.9% in 2000 to 7.4% in 2010 (IBGE, 2010).

Old age must be understood in all its breadth and completeness, since it is a universal biological phenomenon with psychological and social consequences of the most diverse. Like every human situation, aging has an existential dimension, which changes the person's relationship with time, causing changes in its relations with the world and with its own history (WEISS et al, 2010).

Among the main issues related to the aging process are related to the predisposition to situations of disability, mortality and increased risk to vulnerable situations (PERRACINI, 2011).

Aging produces a progressive loss of functional abilities of the organism, and these changes ultimately limit the ability of the elderly to perform their usual activities. The picture that emerges from this set is the inability, adopting the posture of dependence, giving rise to feelings of worthlessness and loneliness that leads to the gradual loss of affective and social relations. Thus, population aging translates into greater burden of disease and disability, reflecting the increased demand for health care of the elderly services (HEREDIA et al, 2005).

One of the major problems of the human aging process is associated with loss of functional capacity, making the total or partially dependent elderly and affecting their autonomy and quality of life. Thus, functional capacity emerges as an ideal for the elderly can live independently and autonomously, being able to perform physical and mental activities necessary for maintaining its basic value activities, such as bathing; dress up; personal hygiene; transfer itself; feed themselves; maintain continence; prepare meals; have the financial control etc. (ALENCAR et al, 2008).

Have been established associations between measures of muscle mass and function, level of physical activity and functional mobility of elderly, demonstrating that slow walking speed and low grip strength can identify elderly people with decreased muscle strength and power of members lower, limitations, and functional decline (GARCIA et al, 2011).

In view of the above, the purpose of this study was to correlate the handgrip strength and performance in the TUG test in the institutionalized elderly.

METHODOLOGY

This research was designed as an exploratory quantitative, observational cohort study (GOLDIM, 2000), being previously approved by the Ethics Committee in Research of the University of Santa Cruz do Sul (UNISC).

The sample for this study consisted of patients of both genders, residents in a long-stay institution philanthropic, located in the city of Santa Cruz do Sul - RS.

Inclusion criteria were seniors who agreed to participate and signed the consent form. Those who had cognitive impairment, presence of fractures recent (past three months), presence of lower limb pain that prevented ambulation, orthopedic diseases and / or advanced reumatologias, severe cardiopulmonary disease and those who did not agree to participate were excluded from the study in research.

For data collection a structured interview composed of personal data (age and gender) and anthropometric (height, weight, BMI) and length of institutionalization These data were obtained by consulting the records of the elderly was used. Tests Palm Gripping Force (PPF) and performance testing in Timed Up And Go Test were also used.

STRENGTH OF HOLD PALM

The PPF was assessed by Dynamometer analog Bulb (Saehan Corporation, Korea). The test of grip strength (FPP) aims palma strength of the individual. The evaluation of the FPP is through the realization of maximum voluntary contraction handgrip, the dominant and non-dominant side of the research subjects (CHAGAS et al, 2010).

To measure the strength elderly volunteer was instructed to sit in a chair with 43 cm, with your back straight and your feet on the ground, He stood with his shoulder in a neutral position, elbow flexed to 90 °, forearm and wrist position neutral. The average of three measurements on each side as score value was used. The measurements were performed alternately between the dominant hand and non-dominant hand. The test result is expressed in kg / force (kgf).

TIME GET UP AND GO

This test quantifies functional mobility in seconds by the time the individual performs the task of getting up from a chair with height of 46 cm, walk three meters as fast as possible without running, turn around, come back and sit with back against the chair (DUKE et al, 2013). The elderly are allowed to use a walker routine and are instructed not to use your arms to get up. The test is performed without physical assistance. The time to complete the task is measured with a stopwatch. The time starts at the command 'go' and ends when the back of the subject is positioned against the backrest of the chair after sitting. Normally the test is performed twice. Shorter times indicate better performance (GOUVÊA et al, 2013; HERMAN et al, 2011).

Both tests were explained and demonstrated by the researcher before the meeting and conducted in an environment free movement of people and paved and flat terrain. Time to time the performance of the volunteer in Test Time Up And Go digital stopwatch was used (Polar ®).

A tabulation of the data was performed using Excel for Windows software (v. 2013). Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS v 20.0). To analyze the data normality the Shapiro-Wilk test was used. To compare the proportion of genera was used by the Chi-square test, all comparisons were performed using Student t test. Since the correlations between the TUG test and FPP dominant and non-dominant hand were performed using Pearson's parametric test. For statistical significance adopted was $p < 0.05$.

RESULTS AND DISCUSSION

The study sample consisted of 20 seniors, 3 excluded for failing to complete the TUG test, with an average age of 69.87 ± 9.11 years. The characteristics and the presence of co-morbidities are displayed in Table 1, the Hypertension evidencing how prevalent disease among the elderly.

Comorbidities	n (%)
SAH	16 (94,1)
Diabetes Mellitus	2 (11,7)
Sequelae AVE	1 (5,8)
Musculoskeletal disorders	1 (5,8)

Table 1: Main co-morbidities found in the sample.

The sample showed homogeneous distribution in virtually all variables, except the PPF only in non-dominant hand, such data were analyzed to detect whether men or women could shift the correlation analysis (Table 2).

It can be observed that men had a lower mean age of women. And with respect to BMI, was found in the mean BMI of women who translates a value above normal weight. The body mass index (BMI), strongly associated with the rate of fat, reflecting the decline in physical fitness on functional limitations (ARROYO, 2007; MACIEL et al, 2011).

The female is identified as a condition of the most vulnerable to institutionalization, because besides women live longer than men, experience a higher probability of being widowed early, going to live alone, since they have difficulties to get married again. Also, have a lower educational level, and consequently, lower social status, tending to disadvantageous economic conditions. This raises a concern, considering that when they get older, they develop special and greater risk of dependency needs, requiring financial resources for health care and better quality of life (MACIEL et al, 2011).

Regarding the evaluation of FPP, studies show that gender differences in neuromuscular activation, changes in muscle temperature induced by hormones, differences in blood flow due to changes in mechanical compression on muscle size and the use of substrates dependent on the size muscle has been suggested as potential mechanisms that lead women to have a decreased muscle strength as well as lower resistance to fatigue (OLIVEIRA, 2009). FPP being an indicator of functionality, its loss in the clinical area can be indicative sign of loss of lean body mass in elderly pricipalmente bedridden, hospitalized or in long-stay institutions (PERRACINI, 2011).

Regarding performance on the TUG test, men had longer durations than women, but without statistical significance but lower performance featuring the TUG test in relation to women, but without significant differences, as well as a shorter duration of institutionalization (Table 2). By taking the test within 10 seconds is considered normal mobility, translating independent seniors; between 11-20 seconds is expected for frail elderly or disabled and partial independence; above 20 seconds indicates significant deficit of physical mobility, and above 14 seconds are prone to falls (GOUVÊA et al, 2013). The sample therefore has a frail elderly or disabled and partial independence profile because varying between 11-20 seconds and still, men have a propensity to falls.

Variables	Grupos		p-value
	Men (n= 9)	Women (n= 8)	
Male (%)	53	47	0,29
Anthropometric characteristics			
Age (years)	64 ± 3,1	73,7 ± 12,1	0,14
Weight (Kg)	63,5 ± 10,9	69,7 ± 20,4	0,43
Height (m)	1,61 ± 0,1	1,59 ± 0,1	0,81
BMI (kg / cm2)	24,6 ± 4,5	26,8 ± 3,1	0,25
Institutionalization of time (years)	4 ± 3,8	6,3 ± 5,1	0,35
Dynamometry			
Dominant Hand	18 ± 5,9	14,7 ± 5,9	0,27
Non-dominant hand	17,6 ± 6,7	10,4 ± 5,6	0,02
Time Up and Go Test			
Average of three times	14 ± 5,9	11,2 ± 2,4	0,21

Table 2: Comparison of variables between genders.

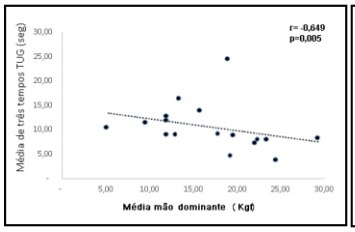
It is uncertain that the decline in muscle strength in the elderly is attributed solely to a decrease in muscle mass. It is also reported that in addition to the progressive loss of mass, structural changes arise musculoskeletal that negatively influence muscle function (DEY et al, 2009).

The weakness of the institutionalized elderly is associated with their functional losses, dependence on caregivers, physical inactivity and acceleration of physiological aging (REBELATTO, 2007).

Is associated with reduced gait speed of elderly people with decreased control of body balance and loss of muscle strength in the lower limbs (ABREU, 2008).

A study of institutionalized elderly, it was found that with advancing age decreased the performance of the elderly on the TUG test, as well as diminished grip strength; men, regardless of age, showed better performance in all tests and better muscle strength (MURILLO et al, 2007; SANTOS et al, 2007). In the present study showed a higher handgrip strength in men and increased gait speed in women.

The most relevant data found in the study was the negative correlation between the average statistical power TUG test variables x FPP dominant hand and TUG x FPP non-dominant hand test, indicating that the muscle grip strength can be tied directly to performance functional legs (Figures 1 and 2).



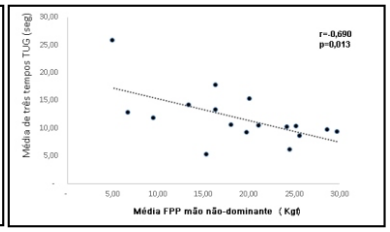


Figure 1. Correlation between TUG and FPP dominant hand.
Figure 2. Correlation between TUG and FPP non-dominant hand

The reductions in strength and muscle power in the elderly may contribute to changes in gait related to aging (CHAGAS et al, 2010) process. Studies demonstrate an important role of loss of muscle quantity and quality decline in the performance of daily tasks, demonstrating reduction in running speed (CHAGAS et al, 2010).

Grip strength is directly proportional to age until about age 30, when begins a gradual and progressive reduction in strength, becoming clinically more noticeable after 60 years. In a study by this author, this relationship was also found, but with weak degree of correlation, which may be explained by the small age range of the sample (61-92 years) and the small sample size relative to other studies that analyzed much larger for individuals in different age groups samples (CRISPIM, 2013).

The TUG test is a widely used tool to assess balance and some functional tasks by means of clinical assessment of mobility and the risk of falls (Berg et al, 1992; Whitney et al, 2004; cited WITTER et al, 2010). The clinical potential of the TUG test is the sequencing of several basic functional skills, such as getting up and sitting down transitions, transitions that require balance, how to turn, and walk straight (MERCANT et al, 2014; SANTANA et al, 2012).

Studies of hand strength in elderly depict an inverse correlation with age and directly with functional decline in the elderly (D'OLIVEIRA, 2010).

One limitation of the study was the fact that no one can have homogenized the co-morbidities of patients, and a fairly low sample number for statistical correlation, which still allowed important findings. Another item that can highlight concerns the instrument used to assess the FPP, since most current references cite the dynamometer Jamar® as best device for this evaluation due to its better grip (HEREDIA et al, 2005).

CONCLUSION

Through this study we can conclude that studies linking variables related to motor disorders in aging are fundamental to the advancement of scientific evidence to enable a more precise guide preventive and rehabilitative physical therapy actions. To contribute to science, are benefiting increasingly elderly population. This is reflected in our study with respect to the main finding, if the negative correlation between the average power and TUG FPP (in both hands) variables, and wherein the evaluation of a test FPP simple, easy and some cheap form an instrument that can guide the evaluation and monitoring of institutionalized patients or even in other conditions, pathological or not.

It is suggested the extension of the study, both the issue of sample size as in the analysis of other variables such as balance, proprioception, cognitive status and related to the aging process.

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Rua Marechal Floriano, 796 – Bairro: Centro
CEP: 95800-000. Venâncio Aires – RS – Brasil.

CORRELATION BETWEEN STRENGTH AND HOLD PALM PERFORMANCE TEST TIMED UP AND GO IN ELDERLY INSTITUTIONALIZED

ABSTRACT

Introduction: Aging produces a progressive loss of functional abilities of the body, particularly the decline of motor skills, which result in loss of independence and autonomy, greatly reducing the quality of life for seniors. Objectives: To study the correlation between handgrip strength (FPP) and performance on the Timed Up Go test (TUG) in institutionalized elderly. Methodology: A quantitative, exploratory observational study group. Sample of elderly residents in long-stay institution, where variables, gender, weight, height, BMI, and FPP TUG test were evaluated, looking for a possible correlation between the functional performance by TUG and FPP. Results: 20 participants (9 men and 11 women) were evaluated, with a mean age 69.87 ± 9.11 years. Outcomes between men and women did not differ variables analyzed, except the PPF in non-dominant hand, where women had lower values. The main finding was the presence of a negative correlation of average statistical power between the variables in x FPP TUG test of non-dominant hand (r = -o, 690; p = 0.013) and dominant hand (r = -0.649; p = 0.005). Women in the study had longer institutionalization (6.3 ± 5.1 years) compared to men (4 ± 3,8anos). Conclusion: Studies related variables related to motor disorders in aging are fundamental to the advancement of scientific evidence to enable a more precise guide preventive and rehabilitative physical therapy actions. To contribute to science, are benefiting increasingly elderly population.

KEYWORDS: Elderly; Handgrip strength; Performance on the test Timed Up and Go.

LIEN ENTRE LA FORCE ET MAINTIEN PALMAIRE PERFORMANCE TEST CHRONOMÉTRÉ LEVER ET ALLER CHEZ LES PERSONNES ÂGÉES EN INSTITUTION

RÉSUMÉ

Introduction: le vieillissement entraîne une perte progressive des capacités fonctionnelles du corps, en particulier la baisse de la motricité, qui se traduisent par la perte de l'indépendance et de l'autonomie, ce qui réduit considérablement la qualité de vie des aînés. Objectifs: étudier la corrélation entre la force de préhension (FPP) et la performance sur le test Timed Up Go (TUG) en personnes âgées institutionnalisées. Méthodologie: Un groupe quantitative, exploratoire d'observation étude. Échantillon de personnes âgées en institution de long séjour, où les variables, le sexe, le poids, la hauteur, le test TUG IMC, et FPP ont été évalués, à la recherche d'une possible corrélation entre la performance fonctionnelle par TUG et FPP. Résultats: 20 participants (9 hommes et 11 femmes) ont été évalués, avec un âge moyen 69,87 ± 9,11 ans. Résultats entre les hommes et les femmes ne diffèrent pas des variables analysées, à l'exception du PPF en main non dominante, où les femmes avaient des valeurs inférieures. La principale conclusion était la présence d'une corrélation négative entre la puissance moyenne statistique entre les variables x essai FPP TUG de la main non dominante (r = -O, 690; p = 0,013) et de la main dominante (r = -0,649; p = 0,005). Les femmes de l'étude avaient plus institutionnalisation (6,3 ± 5,1 ans) que chez les hommes (4 ± 3,8anos). Conclusion: Les études variables liées à des troubles moteurs dans le vieillissement liés sont essentiels à l'avancement de preuves scientifiques pour permettre à un guide plus précis préventive et de réadaptation actions de physiothérapie. Pour contribuer à la science, profitent de plus en plus la population des personnes âgées.

MOTS-CLÉS: Seniors; La force de préhension; La performance de l'equipe de test Timed Up and Go.

CORRELACIÓN ENTRE LA FUERZA Y LA PRUEBA DE RENDIMIENTO PALMAR RETENER TIMED UP AND GO EN ANCIANOS INSTITUCIONALIZADOS

RESUMEN

Introducción: El envejecimiento produce una pérdida progresiva de las capacidades funcionales del cuerpo, en especial la disminución de las habilidades motoras, que se traducen en la pérdida de la independencia y la autonomía, reduciendo en gran medida la calidad de vida para las personas mayores. Objetivos: Estudiar la correlación entre la fuerza de prensión (FPP) y el rendimiento en la prueba Timed Up Go (TUG) en ancianos institucionalizados. Metodología: A, grupo de estudio observacional exploratorio cuantitativo. Muestra de ancianos residentes en instituciones de larga estancia, donde las variables, el sexo, el peso, la talla, se evaluaron prueba TUG IMC, y FPP, en busca de una posible correlación entre el desempeño funcional de TUG y FPP. Resultados: 20 participantes (9 hombres y 11 mujeres) fueron evaluados, con una edad media 69,87 ± 9,11 años. Los resultados entre hombres y mujeres no difieren variables analizadas, excepto la FPP en la mano no dominante, donde las mujeres tenían valores más bajos. El hallazgo principal fue la presencia de una correlación negativa de la potencia estadística media entre las variables en x prueba TUG FPP de la mano no dominante (r = -o, 690; p = 0,013) y la mano dominante (r = -0,649; p = 0,005). Las mujeres en el estudio tenían institucionalización más largo (6,3 ± 5,1 años) que en los hombres (4 ± 3,8anos). Conclusión: Los estudios variables relacionadas con los trastornos motores en el envejecimiento relacionados son fundamentales para el avance de la evidencia científica para permitir una guía más precisa las acciones de prevención y rehabilitación de terapia física. Para contribuir a la ciencia, se están beneficiando población cada vez más envejecida.

PALABRAS CLAVE: Personas mayores; La fuerza de prensión; El rendimento en el prueba Timed Up and Go.

CORRELAÇÃO ENTRE FORÇA DE PREENSÃO PALMAR E DESEMPENHO NO TESTE TIMED UP AND GO EM IDOSOS INSTITUCIONALIZADOS

RESUMO

Introdução: O envelhecimento produz uma perda progressiva das aptidões funcionais do organismo, principalmente pelo declínio das habilidades motoras, que resultam na perda da independência e da autonomia, reduzindo muito a qualidade de vida dos idosos. Objetivos: Pesquisar a correlação entre a força de preensão palmar (FPP) e o desempenho no teste Timed Up Go (TUG) em idosos institucionalizados. Metodologia: Estudo quantitativo, observacional exploratório de grupo. Amostra constituída por idosos residentes em Instituição de Longa Permanência, onde foram avaliados as variáveis, gênero, peso, altura, IMC, teste TUG e FPP, buscando uma possível correlação entre o desempenho funcional pelo TUG e FPP. Resultados: Foram avaliados 20 idosos (9 homens e 11 mulheres), com média de idade 69,87 ± 9,11 anos. Os resultados entre homens e mulheres não se diferenciaram quanto as variáveis analisadas, com exceção da FPP em mão não-dominante, onde mulheres apresentaram menores valores. O principal achado foi a presença de correlação negativa de poder estatístico médio entre as variáveis no Teste TUG x FPP de mão não-dominante (r=-o,690; p=0,013) e mão dominante (r=-0,649; p=0,005). As mulheres do estudo apresentaram maior tempo de institucionalização (6,3 ± 5,1 anos) em relação aos homens (4 ± 3,8anos). Conclusão: Estudos relacionando variáveis referentes às alterações motoras no envelhecimento são fundamentais para o avanço de evidências científicas que possibilitem nortear com maior precisão ações fisioterapêuticas preventivas e reabilitadoras. Ao contribuírem para a ciência, estarão beneficiando cada vez mais a população idosa.

PALAVRAS-CHAVE: Idosos; Força de Preensão Palmar; desempenho no teste Timed Up and Go.