Since muscle strength declines at a higher rate than muscle mass, an age-related decline in muscle strength/mass ratio (i.e., muscle quality) would be expected. The Barthel Index is considered to be the best activity of daily living (ADL) evaluation scale and may associate with handgrip strength. However, it is unknown whether muscle mass and mass in the forearm associate with the Barthel ADL Index in frail older adults.

PURPOSE: To investigate the relationship between forearm muscle mass, muscle quality, and the ADL level assessed using the Barthel Index in old women attending a day care service.

METHODS: Twenty-four old women aged 71-103 (mean age 88 [SD 8] years) had muscle thickness (MT) measured by ultrasound at the anterior forearm of the dominant hand. MT was measured as the perpendicular distance between the subcutaneous adipose tissue-muscle interface and muscle-bone interface of the ulna (MT-ulna). Handgrip strength (HGS) was also measured for the dominant hand. Muscle quality (MQ) was calculated from the HGS to MT-ulna ratio. The ADL level was assessed using the Barthel Index (10BI) and the highest possible score of the 10BI is 100 (10 items). A select 3 items (3BI) of the 10BI, i.e., dressing, walking, descend/ascend stairs were also scored. Lower extremity function (LEF) was scored by testing balance ability with their eyes closed, walking speed, and sitting up speed from the chair. Pearson correlation coefficients were performed for all variables. Partial correlations of MT and MQ with selected variables adjusted for age were also statistically quantified.

RESULTS: The 10BI was positively correlated with age (r=0.452, p=0.027), MT-ulna (r=0.582, p=0.003), MQ (r=0.552, p=0.001), and LEF (r=-0.747, P<0.001). The 3BI was also correlated with age (r=0.501, p=0.013), MT-ulna (r=0.509, p=0.011), MQ (r=0.526, p=0.008), and LEF (r=-0.737, p<0.001). After adjusting for age, LEF was correlated with both MT-ulna (r=0.468, p=0.032) and MQ (r=0.660, p=0.001). However, the 10BI was only correlated with MT-ulna (r=0.468, p=0.032) and the 3BI was only correlated with MQ (r=0.447, p=0.042).

CONCLUSIONS: Muscle quality in the forearm may be an effective variable for determining leg function and abilities like dressing, walking, and descend/ascend stairs in old women attending a day care service.

181  Board #18  June 1, 9:30 AM - 11:00 AM

Relationship Between Arthritis And Muscular Strength In Older Women With Symptoms Of Sarcopenia

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(No relationships reported)

Hand arthritis and sarcopenia are common health problems in older adults and new sarcopenia guidelines recommend the use of grip strength (GS) to determine weakness. Using GS to identify sarcopenia may present a significant challenge when hard arthritis is present and might not be related to other strength measures. However, this has not been thoroughly investigated in older women classified as sarcopenic or dynapenic.

PURPOSE: To determine if GS is related to other measures of upper and lower body strength and to determine if arthritis status is related to sarcopenia or dynapenia identification status in a sample of older women.

METHODS: Community-dwelling older women (n=25, age=72.3±4.6 years) who were screened to be dynapenic or sarcopenic based on standard criteria were recruited for this cross-sectional analysis. GS was measured using standard techniques and arthritis status was determined based on self-report. Chest press (CP1RM) and leg press (LP1RM) one-repetition maximum tests were done using standardized protocols after familiarization. Spearman correlations were used to compare CP1RM, LP1RM, GS scores and a Fisher’s exact test was used to determine if arthritis status was related to sarcopenia status based on new guidelines.

RESULTS: Mean GS was 16.6 ± 3.7 kg and hand arthritis was present in 10 of the 25 women (40%; GS=16.3 ± 4.8 kg). Seven of the 10 (70%) women with arthritis had low GS (< 20 kg) but no other qualifications for sarcopenia, while 8 of the 15 women without arthritis (53%) had low GS but no other qualifications for sarcopenia. These frequency differences were not statistically significant (p=0.679). In addition, there was not a significant correlation between GS and CP1RM (r=0.07, p =0.75) or LP1RM (r=0.09, p=0.66). However, there was a significant relationship between CP1RM and LP1RM (r=0.74, p<0.001).

CONCLUSIONS: These findings indicate that hand arthritis is not related to other measures of upper or lower body strength and does not affect sarcopenia classification status in this sample of older women. Although the use of GS is an accepted modality by two organizations for measuring strength to help identify older women who have sarcopenia, alternative strength tests should be considered when testing those with hand arthritis.

182  Board #19  June 1, 9:30 AM - 11:00 AM

Regression Equation To Predict Body Fat In Elderly Men Using Body Circumference Measures

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The aging process is associated with increase in subcutaneous fat. This study aims at providing a simple screening tool to help health professionals assess body fat in elderly men. High body fat is a risk factor that reduces quality of life and increases mortality rates.

PURPOSE: The purpose of this study was to develop and validate an equation to estimate body composition in elderly men above 60 years of age using body circumference measures.

METHODS: The sample consisted of 85 male individuals with an average age of 69.55 ± 5.89 from the Vitoria metropolitan area. The group was split into two subgroups: a regression group (n=54) used to develop the equations and a validation group (n=31) used for cross reference. A multiple linear regression was used to develop the equation. Both equations were compared using the Student’s t-test for paired samples. The reliability of the equations was analyzed by the Blant and Altman method.

RESULTS: The regression group had the following descriptive metrics: age 68.59±4.6 yr, body weight 78.5±14.9kg, height 1.68±0.6m; and percent body fat 30.41±6.9%. The validation group had the following descriptive metrics: 71.2±7.5yr, body weight 75.25±11.0kg, 1.65±0.5m; and percent body fat 29.4±7.7%. Body circumferences variables were used to develop equations to predict body fat. Using the stepwise selection criteria, the following equation was developed; % body fat = 17.837 + 0.307 (abdomen) – 1.547 (left forearm) + 0.375 (calf) + 0.252 (body mass). Several parameters validated the strength of the equation: R² = 0.742; r² = 0.76 (meaning that 76% of the dependent variable can be explained by the predicting variables); EPE ≤ 3.5%; and validation of the model based on the partial significance (F) of the subset of variables that showed the strongest effect.

CONCLUSION: It is possible to develop an accurate and specific equation to estimate body fat percent in elderly men using circumference measurements that is easy to use as screening tool by health professionals.