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Title

Test-Retest Reliability of Electronic Handgrip Dynamometry and Accelerometry Measured Muscle Function in Older Adults

Priority 1 (Research Category)

Musculoskeletal and rheumatology

Presenters

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Abstract

Context: Handgrip strength is a convenient and reliable measure of strength capacity that generalizes to muscle function. Measures of handgrip strength are collected in primary care settings as a vital sign for the prevention of health conditions related to low muscle strength. However, conventional handgrip dynamometers and methods focus exclusively on strength capacity, which is a single aspect of how muscles function. Utilizing new electronic handgrip dynamometer and accelerometer technologies may allow for additional muscle function attributes to be feasibly measured, which in turn, may help elevate prognostic value and specificity for intervention referral. However, before such measures can be considered in clinical settings, their test-retest reliability needs to be established. Objective: We sought to determine the test-retest reliability of electronic handgrip dynamometry and accelerometry measured muscle function in older adults. Study Design and Analysis: We utilized a 2-visit cross-sectional design, wherein participants visited our location twice approximately 1-week apart. Interclass correlation coefficients were used for the analyses. Setting or Dataset: We collected data on n=123 older adults in a laboratory setting. Population Studied: Generally healthy community-dwelling older adults. Intervention/Instrument: Electronic handgrip dynamometers and accelerometers were used to measure each aspect of muscle function. Outcome Measures: Test-retest reliability of strength, asymmetry, submaximal control, rate of force development, bilateral coordination, fatigability, and contractile steadiness as measured with electronic handgrip dynamometry and accelerometry. Results: The intraclass coefficients for each muscle function measurement were moderate-to-excellent: 0.99 for maximal strength, 0.99 for asymmetry, 0.65 for submaximal control, 0.92 for rate of force development, 0.99 for bilateral coordination, 0.94 for fatigability, and 0.78 for contractile steadiness. Conclusions: Measuring additional aspects of muscle function with electronic handgrip dynamometry and accelerometry showed promising test-retest reliability in older adults. Primary care providers and clinical

investigations may consider utilizing these new tools and methods for more comprehensively assessing muscle function.