



PLR5-640 INTRA-RATER RELIABILITY OF HIP ABDUCTOR ISOMETRIC STRENGTH TESTING IN A STANDING POSITION IN OLDER PERSONS AT RISK OF FALLS

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Background: Weakness of the hip muscles has been shown to be a major factor related to falls in older persons. Maintaining hip muscle strength is thus important to decrease the risk of falls and associated fractures and adverse events. But, to develop an effective muscle strengthening in older persons, a systematic, valid and reliable assessment of strength is necessary. However, the measurement of hip abductor muscle strength in the clinical setting is challenging. A previous study highlighted the feasibility and good intra-rater reliability of a hip abductor strength test in a side-lying position in older people, but the assessment in standing would be more functional and provide better reflection of real life.

Purpose: The aim of this study was to investigate the feasibility and intra-rater reliability of a quick and simple hip abductor strength test in a functional standing position.

Methods: Thirty-two subjects over 65 years of age, including fallers (≥ 1 fall during the last 12 months) and non-fallers were included. Maximum voluntary isometric strength (MVIS) and rate of force generation (RFG) of the hip abductors of the right leg were evaluated in a standing position using a hand-held dynamometer. Two test-sessions were carried out by the same rater. All hip strength values were normalized to participants' weight. Several analyses were carried out: the number of participants that successfully completed the two test-sessions, the time needed to perform the test and, intra-rater reliability for the whole sample and for each group separately. Reliability was determined using the intra-class correlation coefficient ($ICC_{\text{agreement}}$), the standard error of measurement (SEM) and a Bland and Altman analysis (BA).

Results: All recruited persons completed the strength test in standing position, which took a mean 2.47 ± 0.49 minutes for one limb. Intra-rater reliability was higher for MVIS ($ICC=0.98_{[0.95 - 0.99]}$) than RFG ($ICC=0.93_{[0.87 - 0.97]}$) for the entire sample. In the non-fallers, ICC was better for MVIS ($ICC=0.98_{[0.95 - 1.00]}$, $SEM=0.08$ N.kg-1) than RFG parameter ($ICC=0.88_{[0.75 - 0.96]}$, $SEM=1.34$ N.kg-1.s-1). In the fallers sub-group, ICC was $0.94_{[0.89 - 0.98]}$ ($SEM=0.11$ N.kg-1) for MVIS and $0.93_{[0.84 - 0.98]}$ ($SEM=1.12$ N.kg-1.s-1) for RFG. The BA plot showed that the MVIS and RFG values did not differ across test-sessions, showing that no training effect occurred (no systematic effect).

Conclusion(s): The results showed that testing hip strength in a standing position is feasible and rapid. All participants successfully completed the test in less than four minutes. Moreover, intra-rater reliability was good for the total sample as well as for both the faller and non-faller subgroups. Future studies should investigate the diagnostic value of hip abductor strength in standing to discriminate between fallers and non-fallers, and to determine if change in strength following a falls prevention program reduces the risk of falls.

Implications: As testing hip strength in a standing position is feasible, reliable, and better reflects real life situations than strength tests in supine or side-lying positions, we recommend this position for clinical practice for older persons at risk of falls.

Key-Words: Older, Hip abductor, Reliability

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