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A NEW CLINICAL MUSCLE FUNCTION TEST FOR ASSESSMENT OF HIP EXTERNAL ROTATION STRENGTH: AUGUSTSSON STRENGTH TEST

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ABSTRACT

Introduction: Dynamic clinical tests of hip strength applicable on patients, non–athletes and athletes alike, are lacking. The aim of this study was therefore to develop and evaluate the reliability of a dynamic muscle function test of hip external rotation strength, using a novel device. A second aim was to determine if gender differences exist in absolute and relative hip strength using the new test.

Methods: Fifty–three healthy sport science students (34 women and 19 men) were tested for hip external rotation strength using a device that consisted of a strap connected in series with an elastic resistance band loop, and a measuring tape connected in parallel with the elastic resistance band. The test was carried out with the subject side lying, positioned in 45° of hip flexion and the knees flexed to 90° with the device firmly fastened proximally across the knees. The subject then exerted maximal concentric hip external rotation force against the device thereby extending the elastic resistance band. The displacement achieved by the subject was documented by the tape measure and the corresponding force production was calculated. Both right and left hip strength was measured. Fifteen of the subjects were tested on repeated occasions to evaluate test–retest reliability.

Results: No significant test–retest differences were observed. Intra–class correlation coefficients ranged 0.93–0.94 and coefficients of variation 2.76–4.60%. In absolute values, men were significantly stronger in hip external rotation than women (right side 13.2 vs 11.0 kg, $p = 0.001$, left side 13.2 vs 11.5 kg, $p = 0.002$). There were no significant differences in hip external rotation strength normalized for body weight (BW) between men and women (right side 0.17 kg/BW vs 0.17 kg/BW, $p = 0.675$, left side 0.17 kg/BW vs 0.18 kg/BW, $p = 0.156$).

Conclusions: The new muscle function test showed high reliability and thus could be useful for measuring dynamic hip external rotation strength in patients, non–athletes and athletes. The test is practical and easy to perform in any setting and could therefore provide additional information to the common clinical hip examination, in the rehabilitation or research setting, as well as when conducting on–the–field testing in sports.

Level of evidence: 3

Keywords: Dynamic test, hip external rotation, muscle strength, reliability

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