ABSTRACT

**Background:** Evaluation of hip muscle function is considered an important part of the examination and treatment of physically active subjects with hip and groin pain. However, methods to reliably measure explosive hip muscle strength are lacking.

**Hypothesis/purpose:** The purpose was to investigate the reliability of a clinically available set-up using a fixated handheld dynamometer to test isometric peak force and rate of force development of the hip abductors, adductors, flexors, and extensors.

**Methods:** Seventeen subjects (males: 9, females: 8, mean aged 25.4 (+/- 4.2) y, with mean body mass of 73.9 (+/- 15.2) kg, and mean height 174.2 (+/- 12.4) cm) were included. One experienced tester performed all measures in a randomized order. Three trials of isometric peak force and early- (0-100 ms) and late-phase (0-200 ms) rate of force development for the hip abductors, adductors, flexors, and extensors were obtained using a fixated handheld dynamometer. The trial with the highest value for each measure was used for analysis. Test-retest sessions were separated by 30 minutes of rest.

**Results:** No systematic between-session bias were observed for any of the measures. The relative intra-tester reliability (ICC$_{2,1}$) for peak force, 0-100 ms rate of force development, and 0-200 ms rate of force development ranged from 0.93-0.96, 0.82-0.93, and 0.85-0.92, respectively, corresponding to good reliability for all force measures.

**Conclusion:** The present study shows that assessment of isometric hip muscle peak force, including early- (0-100 ms) and late-phase (0-200 ms) rate of force development using a fixated handheld dynamometer have good intra-tester reliability for testing of the hip abductors, adductors, flexors and extensors. Thus, in clinical research settings where an isokinetic dynamometer may not always be readily accessible, the present test procedure can be used as a feasible alternative to reliably provide objective of hip muscle function relevant for rehabilitation of patients with hip and groin pain.

**Level of evidence:** Level 3, Reliability study

**Key words:** groin, handheld dynamometer, neuromuscular function, reproducibility, movement system