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Reliability and Utility of a Lumbopelvic-Hip Complex Stability Assessment in Individuals with Patellofemoral Pain

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OBJECTIVE

Lumbopelvic-hip complex (LPHC) stability is related to altered movement patterns that are present in individuals with PFP. Current studies measuring LPHC function in PFP primarily assess endurance and not stability. A test of isolated LPHC stability, the Seated Trunk Control Test (STCT) was recently developed and test-retest reliability for the STCT has been shown to be excellent in a healthy population. To improve the clinical usefulness of the STCT, we aimed to establish test-retest reliability for individuals with PFP. We hypothesized the STCT would show good-to-excellent reliability. We also compared STCT performance between healthy individuals and those with PFP. We hypothesized those with PFP would have lower TTE and greater NE.

DESIGN and SETTING

Cross-sectional, laboratory study.

PARTICIPANTS

We matched eleven individuals with PFP (10 females; age=22.3±4.3; BMI=23.9±3.2) with eleven healthy controls (10 females; age=22.1±1.3, BMI=23.8±3.6) based on sex and BMI. Participants in the PFP group reported atraumatic patellar pain lasting more than 3 months and current symptoms in line with the consensus recommendation for PFP diagnosis.

INTERVENTION

Participants completed the STCT on 3 separate occasions within 2 weeks. For the STCT, participants sat on a wobble board placed on a step adjusted to a height allowing their feet to slightly touch the ground when

seated. We instructed them to balance on the board, place their arms across their chest, lift their feet slightly off the ground, and close their eyes. Data was collected in two, 30 second test trials. We allowed three practice trials on day 1 only. Uncrossing arms, opening eyes, feet touching the ground, and an edge of the wobble board touching down counted as errors.

MAIN OUTCOME MEASURES

Performance was measured as time to first error (TTE) and number of errors (NE) averaged between test trials. Intraclass correlation coefficients (ICC) with 95% confidence intervals (CI) assessed test-retest reliability utilizing a two-way mixed-effects model with single rater (ICC[3,1]). The Mann-Whitney U Test compared performance measures between groups, $p < 0.05$.

RESULTS

The STCT exhibited good reliability for TTE (ICC=0.818, CI=0.512-0.946) and NE (ICC=0.860, CI=0.621-0.958) in the PFP group. TTE was not different between groups ($p > .05$). Individuals with PFP completed the STCT with greater NE than the healthy individuals on all occasions, with significant differences on days 2 and 3 (Table 1).

CONCLUSION

The STCT is a simple and reliable test that clinicians can use to evaluate LPHC stability in those with PFP. Individuals with PFP perform the STCT with greater NE compared to pain free individuals, suggesting that PFP is related to decreased LPHC stability. Further research could evaluate the differences in strategies

used to complete the STCT between injured and healthy controls.

KEY WORDS: *Patellofemoral Pain, Stability, Assessment*

	Time to first error (seconds) Median (SE)			Number of errors (Median (SE))		
	Healthy	PFP	p-value	Healthy	PFP	p-value
Day 1	30(4.0)	14.9(3.3)	0.438	0(0.3)	1.5(0.9)	0.116
Day 2	7.6(3.5)	7.4(3.0)	0.606	0.5(0.7)	4.0(1.0)	0.047
Day 3	30(3.9)	5.9(3.8)	0.076	0(0.4)	2.0(0.9)	0.047

Table 1. Group difference in performance on the seated trunk control test. Significant difference bold.