FEASIBILITY OF KNEE FLEXION/EXTENSION PROPRIOCEPTION ASSESSMENTS IN A CLINICAL SETTING

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Context: Afferent proprioceptive signals from mechanoreceptors have been suggested as playing a vital role in achieving functional joint stability of the knee. Numerous research studies have evaluated the effects of injury, surgery, and rehabilitation on proprioception. Although widely used in the research laboratory setting, proprioception assessments are rarely utilized in a clinical setting. Yet, isokinetic dynamometry that may be available clinically to assess strength might be a modality that can also be used for assessing proprioception. The feasibility of knee flexion/extension proprioception assessments using dynamometry will be evaluated. **Objective:** To assess intrasession and intersession reliability (intraclass correlation coefficient (ICC)) and precision (standard error of measurement (SEM)) of four common modes of proprioception assessment using isokinetic dynamometry. **Design:** Test-retest one week apart. **Settings:** University medical center based biomechanics laboratory. **Patients or Other Participants:** Ten healthy individuals (5 males, 5 females; Age: 24.1±2.1yrs; Ht: 177.0±13.0cm; Wt: 70.7±14.2kg). **Interventions:** The integrity of proprioceptive information obtained through conscious appreciation can be assessed by joint position sense (JPS), threshold to detect passive motion (TTDPM), force sense (FS), and velocity sense (VS). All testing was performed on isokinetic dynamometry. Subjects sat on the dynamometry chair with knee and hip at 90°. JPS was performed actively by subject movement to a target position or passively by subject indication when the target position was reached. During TTDPM, subjects wore a compression boot, blindfold, and headphones playing static noise and signaled when movement direction (flexion or extension) was deduced. For FS, subjects exerted 30% of their peak isometric torque for 5 seconds with visual feedback and then without visual feedback. For VS, the subjects' knees were passively rotated by the dynamometry at 30°/sec, followed by the subject actively reproducing the velocity. The differences between the target and reproduced values were used for all testing. Subjects performed a total of five repetitions for each test. The middle three repetitions were used in the intrasession analysis, and the average of the middle three repetitions between days 1 and 2 were used in the intersession reliability and precision analyses. **Main Outcome Measurements:** Intrasession ICC(3,1), intersession ICC(3,k), and SEM for all tests. **Results:** The intrasession ICC (SEM) was 0.71±0.27 (1.45±0.63°) for JPS, 0.86±0.07 (0.25±0.07°) for

TTDPM, 0.82±0.10 (1.06±0.51Nm) for FS, and 0.69±0.13 (1.21±0.40°/sec) for VS. The intersession ICC (SEM) was 0.36±0.31 (1.56±0.68°) for JPS, 0.80±0.11 (0.26±0.09°) for TTDPM, 0.79±0.18 (0.94±0.68Nm) for FS, and 0.60±0.23 (1.40±0.26°/sec) for VS. **Conclusions:** Intrasession ICC and SEM suggests high feasibility of isokinetic dynamometry for assessing all proprioception tests for a group comparison purpose. But, intersession ICC and SEM suggests that only FS and TTDPM are feasible for an intervention purpose. These results support the inclusion of proprioception assessments in clinical settings. **Word Count:** 446

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