Author's response to reviews

Title: Validity and inter-rater reliability of an observational clinical test of assessing medio-lateral knee motion during a single-limb mini squat

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Dear Editor,

We hereby submit our paper "Validity and inter-rater reliability of an observational clinical test of assessing medio-lateral knee motion during a single-limb mini squat" for consideration regarding publication in BMC Musculoskeletal Disorders. The study has not been published before and the manuscript is not under consideration in any other journal. It is an international collaborative study between clinical and biomechanical researchers at four different Universities; Sweden, Australia, Canada, and Denmark.

Muscle function may influence the risk of knee injury and outcomes following injury. Measures of muscle strength and hop performance are usually employed to assess muscle function. However, the quality of movement, such as the medio-lateral knee motion may also be important.

The aim of our study was to validate an observational clinical test of assessing the medio-lateral knee motion, using a three-dimensional (3-D) motion analysis system. In addition, the inter-rater reliability was evaluated.

Twenty-five non-injured participants were included. Visual analysis of the medio-lateral knee motion, scored as knee-over-foot or knee-medial-to-foot by two raters, and 3-D kinematic data were collected simultaneously during a single-limb mini squat. Frontal plane 2-D peak tibial, thigh, and knee varus-valgus angles, and 3-D peak hip internal-external rotation, and knee varus-valgus angles were calculated.

We found that the medio-lateral knee motion assessed by visual inspection during the single-limb mini squat was valid in 2-D, showing a medially placed tibia and thigh, and knee valgus in individuals with a knee-medial-to-foot position (n=10) compared to those with a knee-over-foot position (n=15). The actual movement, in 3-D, was mainly exhibited as increased internal hip rotation. The
inter-rater reliability of the observational clinical test was high. Our results suggest that the single-limb mini squat test provides a valid and reliable clinical method to delineate between those with knee-over-foot and knee-medial to-foot positioning during a single limb mini-squat. The test is feasible and easy to administer in the clinical setting and in research to address lower extremity movement quality.

Sincerely,

Eva Ageberg, PhD