Single-leg Squat: Interrater Reliability and Sex Differences in Medial Knee Displacement in Collegiate Athletes

Gillian A. McCarren, Regina M. Misuraca, Dalton Nichols, Daniel C. MacLea, Peter J. Lisman. Towson University, Towson, MD

The Single Leg Squat (SLS) is a commonly performed clinical screening tool used to identify faulty lower extremity biomechanics, specifically dynamic knee valgus. Despite this use, few studies have investigated its reliability or examined if sex-differences exist in SLS performance in athletic populations. **PURPOSE:** Determine interrater reliability of the SLS and investigate whether occurrence of medial knee displacement (MKD) differed between male and female collegiate athletes. **METHODS:** Fifty injury-free Division I collegiate athletes completed SLS testing as part of their preparticipation exam, including 25 men (age=18.5±1.7y, height=185.4±8.7cm, mass=98.9±20.9kg) and 25 women (age=18.1±0.7y, height=167.9±7.8cm, mass=65.5±10.5kg). Participants completed 5 consecutive SLSs on each leg while being recorded with a standard video camera from the frontal plane view. Videos were slowed and paused for scoring purposes. Participants were assigned a positive (+) SLS score if the midpoint of the patella moved to the great toe during the SLS in at least 3 of the 5 trials. All trials were scored by 2 members of the research team (GM, RM). Frequency counts were calculated and agreement of the SLS was analyzed with an unweighted kappa statistic. Pearson Chi-square tests were used to evaluate the association between sex and SLS performance. **RESULTS:** The interrater reliability for the right and left-leg SLS scores was 0.762 and 0.634, respectively, which indicated a substantial level of agreement. The overall percent agreement was 85%. More than half (30 of 50; 60%) of all athletes had a (+) SLS test result in at least 1 leg. Although not significant, females were almost twice as likely ($\chi^2=1.33; p=0.248, \text{OR}=1.96, 95\%\text{CI}=0.62-6.19$) to have a (+) SLS score in at least 1 leg in comparison to males. A significant association was found between bilateral MKD and sex; females were roughly 4 times as likely ($\chi^2=5.33; p=0.021, \text{OR}=4.03, 95\%\text{CI}=1.20-13.53$) to have a (+) SLS score on both legs in comparison to males. **CONCLUSION:** The interrater reliability for the MKD component of the SLS demonstrated a substantial level of agreement. Female collegiate athletes displayed a greater occurrence of MKD than male collegiate athletes. Future work will determine if SLS performance is a predictor of injury in collegiate athletes.