Simple, Accurate In-Office Tool Predicts Athletes at High-risk for ACL Injury

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Previously, determining athletes at high-risk for ACL (anterior cruciate ligament) injuries required expensive and complex laboratory-based motion analysis systems, such as those used in creating video games. But a new study presented today at the American Orthopaedic Society for Sports Medicine's (AOSSM) Annual Meeting, offers physicians a low-cost, in-office, tool to help identify athletes at increased risk.

"ACL injuries are devastating to athletes, and the risk factor for female athletes is much higher," said Greg Myer, sports biomechanist at the Cincinnati Children's Hospital. "In an earlier study, we used motion analysis systems to measure and calculate torques on ligaments which accurately predicted which athletes are high-risk, but this method was expensive, labor intensive and required sophisticated equipment. So in this study, we looked for a low-cost, in office, simpler method to predict which athletes are high-risk."

Unfortunately, women are two to eight times more likely to injure their ACL than men, according to recent studies. Researchers believe this may be due to differences in hormone levels on ligament strength and stiffness, neuromuscular control and fatigue, lower limb biomechanics, ligament strength, as well as a difference in neuromuscular control in women when landing jumps (women appear to have less hip and knee flexion or bending and land more knock kneed than men.)

The good news, according to Myer, is that those athletes who have the higher risk factors of increased knee torques or load are those who also benefit the most from the remedy of neuromuscular training in jumping, posture and building landing strength.

The simpler, lower-cost measure to predict high-risk athletes for ACL injury provides the next critical step to bridge the gap between expensive in-laboratory identification of injury and identification of these injuries in the doctor's office. The simplified method, which can be done in the doctor's office combines measuring the tibia or shin bone with a standard measuring tape and an athlete's weight in combination with motions of the knee during landing captured with standard camcorders. These simple factors can quickly identify young females who demonstrate a primary risk for ACL injury. The in-office method strongly correlated to the expensive laboratory method with variables that ranged from 0.87 to 0.98.

"This method may be used as a training camp protocol in partnership with team clinicians or set up and run in the athletic training setting," said Myer. "Current evidence indicates that athletes identified as high-risk for ACL injury using this approach are more responsive to neuromuscular training aimed at reducing this risk factor. This tool can also be used to get high-risk athletes into appropriate interventions to further reduce their potential of injury risk which may increase both the efficacy and efficiency of future interventions aimed to prevent ACL injury in female athletes."

Provided by American Orthopaedic Society for Sports Medicine

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