

Altered Lower Extremity Biomechanical Risk Factor Related to Anterior Cruciate Ligament Injury in Athlete with Functional Ankle Instability

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Abstract : Background: Ankle sprain is one of the most important risk factor of anterior cruciate ligament (ACL) injury. Also, functional ankle instability (FAI) population has alterations in lower extremity sagittal plane biomechanics during landing task. We want to examine whether biomechanical alterations demonstrated by FAI patients are associated with the mechanism of ACL injury during high risk and sport related tasks. Methods: Sixteen basketball player with FAI and 16 non-injured control performed a single-leg cross drop landing. Knee sagittal and frontal (ATSF) was calculated. Independent t-tests, multiple linear regression, and Pearson correlation were used for analysis data. Result: Subject with FAI showed more peak ATFS, posterior ground reaction force (GRF) and less knee flexion, compared to the controls ($P= 0.001$, $P= 0.004$, $P= 0.011$). Knee flexion ($r= -0.824$, $P = 0.011$) and posterior GRF ($r= 0.901$, $P = .001$) were correlated with ATSF; Posterior GRF was factor that most explained the variance in ATSF ($R^2= 0.645$; $P = .001$) in the FAI group. Conclusions: Result of our study showed there is a potential biomechanical relationship between the presence of FAI and risk factors associated with ACL injury mechanism.

Keywords : functional ankle instability, anterior cruciate ligament, biomechanics, risk factor

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