

## Identification of Risk Factors for Re-Injury After Anterior Cruciate Ligament Reconstruction

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### Summary:

Factors that can determine an ACL re-injury after return to sport

### Abstract:

The decision of whether an athlete is ready to return to sport (RTS) after anterior cruciate ligament reconstruction (ACLR) is very critical and hides the real risk for an ACL re-injury. Interestingly, and to our surprise, no studies have ever been performed to identify risk factors for re-injuries after RTS. Therefore, the purpose of this study is to identify which factors determine an ACL re-injury after RTS.

133 athletes met the inclusive criteria of this study. Subjects had to be national athletes registered to a professional sports club in Qatar. All patients underwent an ACL reconstruction, were treated and discharged from rehabilitation department of Aspetar, Orthopaedic and Sports Medicine Hospital after completing their discharge tests. (Biodex test at 60, 180 and 300 deg/sec, running T-test and 3hop tests, single hop, triple hop and triple crossover hop). Their medical files were examined, demographic and anthropometric data was recorded as well as all the discharge tests' results. All the injuries occurred after returning to sport were also recorded.

From the 133 subjects, 23 had an ACL re-injury after RTS. Statistical analyses (Cox-regression model) between those who had an ipsilateral ACL injury and those who did not, showed a likelihood for ipsilateral injury to those who had a significant higher quadriceps' strength at 60deg/sec ( $p=0.001$ ) and a higher bilateral difference on peak torque of the quadriceps at 60deg/sec ( $p=0.039$ ), with the injured leg presenting the lowest strength. Cox regression analysis also identified a lower quadriceps' strength of the injured leg at 300deg/sec ( $p=0.013$ ) as another risk factor for an ACL re-injury. Finally, statistical analysis showed that those, who completed their rehabilitation and fulfilled all the discharge criteria had significantly less chances ( $p=0.025$ ) to sustain a future ACL re-injury after RTS. Results from the running T-test and the different hop tests did not influence the likelihood for an ACL re-injury.

The results of this study showed that increased quadriceps strength at lower speeds (60deg/sec) and a higher strength deficit between quadriceps at this speed with injured leg being weaker can be considered as risk factors for an ACL re-injury after return to sport. In addition, decreased explosive strength at 300 deg/sec is also identified to increase the likelihood of ACL re-injury. Moreover, failure to complete postoperative rehabilitation significantly increases the risk for an ACL re-injury.

It was concluded that running T-test, and the different hop test values were not able to determine whether somebody is at higher risk to have an ACL re-injury after RTS. Based upon these results, clinicians should emphasize more on increasing the explosive strength and decreasing the strength deficit between the two legs before allowing athletes to return to sports participation. By taking this into account, and making sure that the athletes fulfill all the discharge criteria before RTS, the risk of ACL re-injury can be decreased.