

## **Assessment of gait symmetry improvements in national athletes after anterior cruciate ligament reconstruction during rehabilitation**

### **ABSTRACT**

This study aimed to quantify changes in gait parameters and their symmetries among athletes with anterior cruciate ligament (ACL) reconstructions during a rehabilitation program. Twenty-two national players with ACL reconstructions and 15 healthy athletes were recruited. The gait data were collected between postoperative weeks 4-5, 8-9 and 12-13 using a three-dimensional motion analysis system. The spatio-temporal gait parameters and symmetry indexes (SIs) were evaluated for the patients and the control group. One-way and repeated-measures multivariate analysis of variance were used to analyse the data. The results demonstrated significant differences among spatio-temporal ( $P < 0.001$ ) and SIs ( $P = 0.007$ ) of patients for Test 1 and the control group. Repeated measure analysis revealed significant changes in the linear combinations of spatio-temporal gait variables ( $P = 0.002$ ) and SIs ( $P = 0.043$ ) over time. The injured limb's step length, cadence and weight acceptance time presented significant improvement across time ( $P < 0.001$ ). Moreover, the SI of the stance time was reduced significantly by 46.48% ( $P = 0.004$ ) among SI parameters. After three months, no significant differences were found between patients and healthy controls for the measured gait components ( $P > 0.05$ ). The rehabilitation program allowed national athletes to restore symmetry in spatio-temporal gait parameters toward the control group's range 12-13 weeks post-reconstruction.

**Keyword:** Gait analysis; Symmetry; Anterior cruciate ligament; Reconstruction; Spatio-temporal