

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