The Clinical Significance of the Single Leg Hop in Qualifying Outcomes after ACL Reconstruction: Normative Study

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Discussion

Subjects

Subjects were matched on age, gender, and height. All subjects were required to have a recent history of anterior cruciate ligament (ACL) reconstruction surgery. The primary outcome measure was the single leg hop for distance (SLHD). Subjects were divided into two groups: the ACL group and the uninjured control group. The ACL group included individuals who had undergone ACL reconstruction surgery within the last 6 months and who had recovered to the point where they could perform full squatting and jumping activities. The uninjured control group consisted of healthy individuals with no history of lower extremity surgery or injury.

Methods

The study was conducted in a single-session laboratory setting. Participants were required to perform a single-leg hop for distance (SLHD) and to complete isokinetic dynamometry tests for hip and knee extensors and flexors. Joint angles and forces were measured using 2 force plates sampled at 1200 Hz and filtered at 50 Hz. Kinematic data were collected using a 3D motion analysis system.

Results

The results demonstrated that the ACL group had significantly lower hop distance compared to the uninjured control group. The hip and knee extensor moments and forces were also lower in the ACL group. There were no significant differences in hip and knee flexor moments and forces between the groups.

Conclusions

The findings of this study suggest that individuals who have undergone ACL reconstruction surgery have long-term strength and kinematic deficits despite meeting clinical thresholds for return to sport. This indicates that while knee joint kinetics and kinematics may return to normal, athletes still exhibit marked deficits in recovery long after surgery.

References


Recent studies have indicated that common clinical outcomes after ACL reconstruction are adequate to meet patient and healthcare expectations, but may fall short of an athlete's expectations. This may be due to the increased demands placed on the knee joint during activities such as jumping.

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The single leg hop for distance (SLHD) is a common clinical outcome measure used to assess the functional capacity of the lower extremity after anterior cruciate ligament (ACL) reconstruction. However, the clinical significance of this measure has not been well-established. A normative study was conducted to determine the expected range of SLHD in healthy individuals and to establish a threshold for return to sport.

The study included 60 healthy individuals aged 18-35 years old. Participants were divided into two groups: a male group (n=30) and a female group (n=30). The SLHD was performed on a single leg, starting from a 90° knee flexion position, with the contralateral leg extended. The distance hopped was measured in centimeters, and the test was repeated three times, with the best attempt recorded.

The results showed that the SLHD distance varied significantly between genders. The mean distance for males was 2.12±0.46m, while the mean distance for females was 1.23±0.32m. The SLHD distance also varied significantly between age groups. The mean distance for individuals aged 18-24 years old was 2.31±0.49m, while the mean distance for individuals aged 25-35 years old was 1.98±0.37m.

The findings of this study suggest that the SLHD is a sensitive measure of lower extremity function and can be used to assess the clinical significance of this outcome measure. The results also highlight the need for gender-specific and age-specific norms for the SLHD distance.

Data Analysis

The data was analyzed using a repeated measures ANOVA. The within-subject factor was gender, and the between-subject factors were age and group. The alpha level was set at 0.05.

Results

There were significant main effects of gender, age, and group on SLHD distance. The post-hoc tests revealed that males had a significantly greater SLHD distance compared to females. The mean difference was 0.89m (95% CI: 0.76-1.02, P<0.001). The mean difference between age groups was also significant, with individuals aged 18-24 years old having a greater SLHD distance compared to those aged 25-35 years old, with a mean difference of 0.33m (95% CI: 0.21-0.45, P<0.001).

The group factor revealed that the ACL group had a significantly lower SLHD distance compared to the uninjured control group. The mean difference was 0.54m (95% CI: 0.42-0.67, P<0.001).

Discussion

The results of this study suggest that the SLHD is a sensitive measure of lower extremity function and can be used to assess the clinical significance of this outcome measure. The findings also highlight the need for gender-specific and age-specific norms for the SLHD distance.

Conclusion

The SLHD is a sensitive measure of lower extremity function and can be used to assess the clinical significance of this outcome measure. The results also highlight the need for gender-specific and age-specific norms for the SLHD distance.