

# ACUTE EFFECT OF LOW-INTENSITY ECCENTRIC EXERCISE ON ANGLE OF PEAK TORQUE IN SUBJECTS WITH DECREASED HAMSTRING FLEXIBILITY

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## ABSTRACT

**Background:** Decreased hamstring flexibility and the angle of peak torque (APT) occurring at a shorter muscle length are considered risk factors for hamstring strain injury. Subjects with decreased hamstring flexibility have an APT that occurs at a shorter muscle length; hence, the susceptibility to hamstring strain injury could be associated with the APT occurring at a shorter muscle length. Low-intensity eccentric exercise (ECC-Ex) may reduce hamstring strain injury risk in the subjects with decreased hamstring flexibility by allowing the APT to occur at a longer muscle length. However, the acute effect of low-intensity ECC-Ex on the subjects with decreased hamstring flexibility has not been established.

**Hypothesis/Purpose:** The purpose of this study was to investigate the acute effect of low-intensity ECC-Ex on the peak torque, APT, and hip flexion angle in the subjects with decreased hamstring flexibility. The authors hypothesized that low-intensity ECC-Ex would shift the APT, allowing it to occur at a longer muscle length with a minimum decrease of peak torque and hip flexion angle in the subjects with decreased hamstring flexibility.

**Study design:** Case-control study

**Methods:** Twelve male college students were categorized into normal group [n = 6 (12 legs)] and decreased hamstring flexibility group [n = 6 (12 legs)] based on the median value of the baseline hip flexion angle (i.e., 80.8°) measured by passive straight leg raise test. Peak torque and APT during maximal voluntary eccentric knee flexion (via isokinetic dynamometer) and hip flexion angle were evaluated before and after the low-intensity ECC-Ex in both groups.

**Results:** Low-intensity ECC-Ex shifted the APT, causing it to occur at a longer muscle length in the decreased hamstring flexibility group. Low-intensity ECC-Ex increased the hip flexion angle and did not change the peak torque in both groups.

**Conclusion:** The results of the present study demonstrated that low-intensity ECC-Ex shifts the APT to occur at a longer muscle length and increases the hip flexion angle without a decrease in peak torque in the subjects with the decreased hamstring flexibility.

**Level of Evidence:** 3b

**Keywords:** Angle of peak torque, flexibility, hamstring strain injury, low-intensity eccentric exercise

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