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学位論文題名 (注: 学位論文題名が英語の場合は和訳をつけること)

The effect of exercise and desk task on one-leg landing motion
(運動課題および机上課題が片脚着地動作に及ぼす影響について)

学位の種類: 修士 (理学療法学)

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注: 1 ページあたり 1,000 字程度 (英語の場合 300 ワード程度) で、本様式 1~2 ページ (A4 版) 程度とする。

Anterior cruciate ligament (ACL) injury is one of the most frequent sports injuries, and previous studies have shown that fatigue accumulation is a risk factor for sports injuries. The purpose of this study was to inform prevention of ACL injury by investigating how exercise and desk tasks affect trunk and lower limb alignment and ground reaction force (GRF) during one-legged landing movements.

The study subjects comprised 12 men who performed a one-leg landing movement from a 30 cm high platform before and after intervention tasks. Intervention tasks included a lower extremity movement task, a respiratory and circulatory system movement task, and a desk-based task. For the measurement of joint angles and moments and ground reaction force, a three-dimensional motion analysis device and a floor reaction force meter were used.

Statistics were performed using Wilcoxon's signed rank sum test as a multiple comparison test with Bonferroni adjustment to compare the difference in effects.

The results showed that the maximum trunk flexion angle during landing on one leg was significantly lower in the brain fatigue group than in the control group. Brain fatigue may have altered the postural strategy before and after landing, resulting in a decrease in trunk flexion angle. The time to pVGRF was shortened in the leg muscle fatigue group, suggesting that there may be an increased risk of ACL injury.

Time to pVGRF during lower extremity muscle fatigue and trunk flexion angle during brain fatigue, which were altered during the 10-minute task and prior to reaching maximal fatigue, may be more pronounced during such actual sports activities. Thus, the results of this study are important for the prevention of ACL injury.