

## **Abstract**

**Title:** The effect of initial position in ankle joints on the muscle activity of the quadriceps femoris during reverse Nordic Hamstring Exercise measured using surface electromyography

**Objectives:** The aim of this study is to compare the effect of a different initial position of ankle joints on the muscular activity of the m. quadriceps femoris during performing rNHE, which can be recorded by surface electromyography.

**Methods:** Two variants of the initial position of the ankle joint were performed during the rNHE exercise. The first variant was performed with dorsal flexion in the ankle joint and the second variant was performed with plantar flexion of the ankle joint. Overall 33 probands were selected for this research. The selection was intentional due to the nature of the study and its participants represented a healthy population. Each variant of the rNHE was performed 3 times, the duration of one repetition was 3 s, the angular velocity was  $30^\circ / \text{s}$ . Muscle activity of the rectus femoris, lateral vastus muscle and medial vastus muscle was measured using surface electromyography.

**Results:** The results demonstrate the effect of a change in the initial position of the ankle joint on the muscle activity of the quadriceps femoris muscle during the reverse Nordic Hamstring Exercise. We recorded an increase of average muscle activity in the position with plantar flexion of the ankle joint in all measured parts of the quadriceps femoris muscle by at least 48,55 % and increase of the maximum muscle activity of the quadriceps femoris muscle by at least 46,37 % (both at the significance level of  $p \text{ value} = 0,05$ ) compared to the rNHE version with dorsal flexion of the ankle joint.

**Key words:** surface electromyography, reverse Nordic Hamstring Exercise, m. quadriceps femoris, eccentric muscle contraction