

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Student: Nikola Melicharová

Supervisor of master thesis: PharmDr. Miroslav Kovařík, Ph.D.

Title of master thesis: Evaluation of muscle strength and endurance of lactating women

This work aims to evaluate the change in the parameters of muscle strength and endurance of the upper and lower limbs in women during breastfeeding. Compare these measured values between the right and left limbs. Another goal is to test the connection between dynamometric parameters and the intake of micronutrients in food supplements.

10 lactating women aged 29-39 took part in the measurement. The women were examined four times. The first examination L1 took place on average 29 ± 5 days postpartum, the second L2 93 ± 29 , the third L3 179 ± 15 , and the last measurement was L4 274 ± 3 days postpartum.

A digital pinch/grip analyzer and digital myometer were used to measure muscle strength and endurance of the upper and lower limbs. We used the BCM – Body Composition Monitor device to measure fat-free mass. Weight was measured for women using a body analysis scale from Tanita.

When evaluating the measured results, we discovered a statistically significant difference between the values of the maximum strength of the left hand measured in the L2 and L3 periods. When measuring L3, there was a decrease in maximum force by approx. 9%. The decrease was evident even after calculating the maximum force on the body surface. In this case, there was a difference of about 7% between the L2 and L3 periods. Furthermore, we encountered a statistically significant difference in the measured values on the left hand for the area under the curve parameter converted to body weight. Between the periods L1 and L4, there was a significant increase in this parameter by about 21%. When comparing individual dynamometric parameters between the right and left limbs, we found a difference between the upper limbs in the L1 period and between the lower limbs in the L3 period. The upper limbs differed significantly in the measured values of area under the curve, the area under the curve converted to weight, lean mass, and body surface area. We measured higher values on the right hand. For the lower limbs, there was a significant difference between the measured values of total and target time expressed in seconds. We measured higher values of these two parameters on the left leg. However, most of the monitored dynamometric parameters did not differ between individual measurement periods. The maximal strength measured in lactating women corresponded to physiological values. Furthermore, we demonstrated the connection between some dynamometric parameters and the intake of calcium, phosphorus, zinc, copper, vitamins A, B1, B6, and D in food supplements.

Key words: muscle strength, muscle endurance, lactating women