Abstract

Title: Analysis of electromyographic activity of selected muscles in exercises on selected balance surfaces.

Objective: The objective of this dissertation was to document, compare and analyze electromyographic activity of m. gluteus maximus et medius, of m. erector spinae at the level L3 and of m. quadriceps vagus medialis et lateralis in exercises on selected unstable surfaces – on a cylindrical board and in balance sandals.

Methods: The work was elaborated as a pilot study. Surface electromyography was used for objectification. The researched group consisted of 7 volunteers (5 women and 2 men), who had no serious injuries and surgeries in their anamnesis and none of them did any sports for a long period. Electromyographic activity of the above mentioned muscles was compared when doing two clearly defined exercises (stand on one lower extremity and hovering/gait on the spot) in balancing sandals and on a cylindrical board in sagittal plane.

Results: The results only confirmed two hypotheses out of five ones. Namely it was the hypothesis no. 2 that the lowest activity of m. gluteus maximus was reached while doing exercise no. 3 – hovering/gait on the spot on a cylindrical board and the hypothesis no. 3 that the highest activity of m. erector spinae was reached while doing exercise no. 4 – hovering/gait on the spot in balancing sandals. The results did not confirm the next three hypotheses. The activity of m. gluteus medius was high while doing exercises no. 1 and 2 that means while standing on one lover extremity both on a cylindrical board and in balancing sandals. The highest electrical activity of m. quadriceps vastus medialis et lateralis was reached while doing exercises no. 4 and 3.

Keywords: Electromyography, electromyographic analysis, cylindrical board, balancing sandals, m. gluteus maximus et medius, m. erector spinae, m. vastus medialis et lateralis.