

Abstract

Title: EMGs of Back Muscles in Relation with Different Settings of the Straps of Backpacks

Objectives: The aim of this study is to compare the electrical activity of chosen muscles during the gait with student backpack and during the different types of placing the backpack on the back in the vertical plane. The second aim is to find what is the best type of the backpack placement on the back based on the electrical activity.

Methods: This thesis is an analytical-experimental research. In the theoretical part, there is a review of available sources relating to existing studies about load carriage, especially backpack carrying. It is preferentially about school type of backpacks, the recommended load limit, the way of placing a backpack on the back and the way of placing a load in the backpack. In the experimental part, there are methods used during experiment. The surface electromyography was chosen as an experimental method. M. trapezius pars descendens, m. erector spinae and m. rectus abdominis were chosen for recording the EMG signal. The data were recorded during the gait with the backpack of 10% of proband's weight and during 3 different types of backpack placement. The upper type of placement was placed with the centre of the backpack in the level of seventh thoracic vertebra (T7), the middle type of placement was placed in the level of the twelfth thoracic vertebra (T12) and the low type of placement was placed in the level of the third lumbar vertebra (L3).

Results: The result of this study is that the electrical activity of chosen muscles is different among the types of the backpack placement. In the low type of placement, there is the lowest electrical activity of m. trapezius pars descendens. There is also the asymmetry of electrical activity of m. rectus abdominis and m. erector spinae especially in the upper and low type of placement. According to that, the middle type of backpack placement was chosen as the best one, though it would be better to do one more research with the larger group of probands.

Keywords: EMG, backpacks, load carriage