

Variability in surface electromyography of right arm biceps brachii muscles between male adolescent, vicenarian and tricenarian with distinct electrode placement

Abstract

The aim of this paper was to verify and measure the variability in surface electromyography (sEMG) of upper arm biceps brachii muscle during isometric contraction. Nine healthy right arm dominated males from three age-groups (adolescents, vicenarian, and tricenarian) were selected for the study. Electrodes were placed horizontally on three individual locations of the subjects' biceps brachii muscle, i.e., on the muscle belly of the biceps brachii, and on the upper and lower portion of the muscle belly. Average EMG (mean), standard deviation (SD), and coefficient of variations (CV, %) were calculated to verify the consistency of the different age groups' muscle activities. Moreover, EMG mean values were analyzed with two-way repeated measures analysis of variances (ANOVA) to monitor significant intra- and inter-muscle coordination. An online, three-channel connected and touch-proof wireless sensor was used to record the EMG signal. The results revealed muscle variability and consistency as well as the significant superiority on the biceps brachii muscle. This findings attempt to fulfill the gaps left by previous experiments based on EMG variability, subject's age variation, electrode placement, muscle contractions, etc. and to identify areas for further researche in the fields of rehabilitation, sports, and other biomedical concerns.

Keywords — Age, biceps brachii, electrode, EMG, variability, wireless sensor