عنوان مقاله:

?Does Muscle Fatigue Alter EEG Bands of Brain Hemispheres

محل انتشار:

مجله فیزیک و مهندسی پزشکی, دوره 10, شماره 2 (سال: 1399)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Sh Taghizadeh - *PhD, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran*

S Pirouzi - *PhD, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran*

A Zamani - *PhD, Department of Medical Physics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran*

A Motealleh - *PhD, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran*

Z Bagheri - *PhD, Department of Biostatistics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran*

خلاصه مقاله:

Background: Muscle fatigue has been known to influence brain activity, but very little is known about how cortical centers respond to muscle fatigue.Objective: This study was conducted to investigate the effects of muscle contraction and fatigue induced by two different percents of maximal voluntary contraction (MVC) on Electroencephalography (EEG) signals.Material and Methods: In this quasi-experimental study, EEG signals were recorded from twenty-one healthy human subjects during three phases (rest, pre fatigue and post fatigue) contraction of Adductor pollicis muscle (APM) at ۳۰% and ۷۰% MVC. The mean powers of EEG bands (alpha, beta and gamma) were computed offline in the frequency domain.Results: None of the three phases with each percent of MVC revealed significant differences for all bands (p>۰.۰۵). Comparison of two hemispheres showed that right hemisphere gamma band activity was enhanced during pre-fatigue state at ۳۰% MVC (p= ۰.۰۴۲) and post-fatigue state at ۷۰% MVC (p= ۰.۰۲۸). Right hemisphere beta band activity also increased prominently at ۷۰% MVC in post-fatigue condition (p = ۰.۰۳۰).Conclusion: These results suggest muscle contraction and fatigue at ۳۰% and ۷۰% MVC have no significant effect on EEG activity, but the trends of beta and gamma band activities are almost similar in each percent of ۳۰% and ۷۰% MVC. Right brain hemisphere shows more activity than left hemisphere in beta and gamma rhythm after fatigue state at ۷۰% MVC.

کلمات کلیدی:

Electroencephalography (EEG), Maximal Voluntary Contraction (MVC), Alpha Band, Beta Band, Gamma Band, Muscle fatigue, Muscle Contraction