Analysis of independent components of cognitive event related potentials in a group of ADHD adults.

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doi: 10.1515/prilozi-2016-0004.

Abstract

In the last decade, many studies have tried to define the neural correlates of attention deficit hyperactivity disorder (ADHD). The main aim of this study is the comparison of the ERPs independent components in the four QEEG subtypes in a group of ADHD adults as a basis for defining the corresponding endophenotypes among ADHD population. Sixty-seven adults diagnosed as ADHD according to the DSM-IV criteria and 50 age-matched control subjects participated in the study. The brain activity of the subjects was recorded by 19 channel quantitative electroencephalography (QEEG) system in two neuropsychological tasks (visual and emotional continuous performance tests). The ICA method was applied for separation of the independent ERPs components. The components were associated with distinct psychological operations, such as engagement operations (P3bP component), comparison (vcomTL and vcom TR), motor inhibition (P3supF) and monitoring (P4monCC) operations. The ERPs results point out that there is disturbance in executive functioning in investigated ADHD group obtained by the significantly lower amplitude and longer latency for the engagement (P3bP), motor inhibition (P3supF) and monitoring (P4monCC) components. Particularly, the QEEG subtype IV was with the most significant ERPs differences comparing to the other subtypes. In particular, the most prominent difference in the ERPs independent components for the QEEG subtype IV in comparison to other three subtypes, rise many questions and becomes the subject for future research. This study aims to advance and facilitate the use of neurophysiological procedures (QEEG and ERPs) in clinical practice as objective measures of ADHD for better assessment, subtyping and treatment of ADHD.