研究業績　英文表記

和文	
表題	モバイル脳波技術を用いた注意課題関連脳波信号変動の評価: 実験的研究
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英文	
Title	Assessing attentional task-related electroencephalogram signal variations by using mobile electroencephalogram technology: An experimental study
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Abstract	Background: A better understanding of the network responses of cortical activities during rest and cognitive tasks is necessary. Therefore, in this study, we aimed to evaluate cerebral activities during attentional tasks by using mobile electroencephalography, identifying the types of attentional components and brain waves. Methods: In this experimental study, we enrolled 12 healthy young adults. The attentional tasks comprised parts A and B of the Trail-Making Test (TMT). Nineteen electroencephalography electrodes were placed over various brain regions. The Wilcoxon signed-rank test was used to examine the differences in power levels between the rest and TMT conditions. Results: During TMT part A, the electroencephalography power level of the delta waves was significantly higher in the right frontal, left central, left occipital, left inferior frontal, right mid-temporal, right posterior temporal, and middle parietal areas ($P < .05$) than those during the resting state; that of the alpha waves was significantly lower in the left posterior temporal area ($P = .006$); and that of the high gamma waves was significantly lower in the left parietal ($P = .05$) and left occipital ($P = .002$) areas. During TMT part B, the electroencephalography power level of the beta waves was significantly higher in the right frontal area ($P = .041$) than that during the resting state, and that of the low gamma waves was significantly higher in the left frontal pole, right frontal, and right inferior frontal areas ($P < .05$). During the focused attentional task, the power level of the delta waves increased and that of the alpha waves decreased, and during the alternating attentional task, those of both the beta and gamma waves increased. The delta waves were related to the whole brain, the alpha and high gamma waves to the left posterior lobe, and the beta and low gamma waves to both frontal lobes. Conclusion: These findings contribute to the basic knowledge necessary to develop new attentional assessment methods for clinical situations.
keyword	Attention, EEG, Electroencephalogram, Higher brain function, Neuroimaging, Neurorehabilitation, Neuroscience

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