عنوان مقاله:

Evaluation of Drug Abuse on Brain Function using Power Spectrum Analysis of Electroencephalogram Signals in Methamphetamine, Opioid, Cannabis, and Multi-Drug Abuser Groups

محل انتشار:

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خلاصه مقاله:

Background: The effect of different types of substances on brain function is still challenging; however, many studies have shown the functional and structural damage to the brain under influence of substance abuse. Objective: This study aimed to quantitatively compare the effect of opioid (Op), methamphetamine (Meth), cannabis (Can), and simultaneous methamphetamine and opioid (Multi-Drug (MD)) abuse on brain function. Furthermore, the impacts of pure Op and Meth abuse were considered with simultaneous substance abuse.Material and Methods: In this descriptive study, the electroencephalogram (EEG) signal was recorded from ۵۲ participants in the Meth, Op, Can, and MD abusers, and the Healthy Control (HC) groups at rest state. EEG data were analyzed on the frequency domain with electrode-based, cortex-based, and hemisphere-based approaches. Results: However, the power spectrum in the delta band in the Op group, the gamma band in the Can group, and the gamma and beta bands in the MD group more significantly increased compared to the HC group, the power spectrum values in the Meth group reduced in the alpha, beta, and gamma bands. Moreover, the power spectrum values in the MD group more significantly higher than the Meth and Op groups in the beta and gamma bands. Conclusion: Since substance abuse in different types caused various changes in frequency components, the different power spectrum bands analysis in abusers can be reasonable to apply as a biomarker to detect the drug types.

کلمات کلیدی:

Electroencephalography, Cannabis, Opioid-related disorders, Power Spectrum Analysis, Methamphetamines