EEG Classification during Scene Free-Viewing for Schizophrenia Detection

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Currently, the diagnosis of schizophrenia is made solely based on interviews and behavioral observations by a trained psychiatrist. Technologies such as electroencephalography (EEG) are used for differential diagnosis and not to support the psychiatrist's positive diagnosis. Here, we show the potential of EEG recordings as biomarkers of the schizophrenia syndrome. We recorded EEG while schizophrenia patients freely viewed natural scenes, and we analyzed the average EEG activity locked to the image onset. We found significant differences between patients and healthy controls in occipital areas approximately 500 ms after image onset. These differences were used to train a classifier to discriminate the schizophrenia patients from the controls. The best classifier had 81% sensitivity for the detection of patients and specificity of 59% for the detection of controls, with an overall accuracy of 71%. These results indicate that EEG signals from a free-viewing paradigm discriminate patients from healthy controls and have the potential to become a tool for the psychiatrist to support the positive diagnosis of schizophrenia.