Automatic Detection of Childhood Absence Epilepsy Seizures: Toward a Monitoring Device

Automatic detections of paroxysms in patients with childhood absence epilepsy have been neglected for several years. We acquire reliable detections using only a single-channel brainwave monitor, allowing for unobtrusive monitoring of antiepileptic drug effects. Ultimately, we seek to obtain optimal long-term prognoses, balancing antiepileptic effects and side effects. The electroencephalographic appearance of paroxysms in childhood absence epilepsy is fairly homogeneous, making it feasible to develop patient-independent automatic detection. We implemented a state-of-the-art algorithm to investigate the performance of paroxysm detection. Using only a single scalp electroencephalogram channel from 20 patients with a total of 125 paroxysms >2 seconds, 97.2% of paroxysms could be detected with no false detections. This result leads us to recommend further investigations of tiny, one-channel electroencephalogram systems in an ambulatory setting.

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