Extended seizure detection algorithm for intracranial EEG recordings

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Pharmaco-resistance temporal epilepsy. An analysis in 33 neurosurgical patients

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Objective: Analysis of clinical manifestations, critical, intercritical and intraoperative EEG monitoring in temporal epilepsy's patients with medical treatment resistance successfully controlled surgically.
Methods: Retrospective analysis, 33 patients. In statistical average terms, the age was 36 years, with 9 monthly seizures, 22 years of disease's course and 3 antiepileptic polytherapy treatment. The average of days of revenue was 6.42 days, on video EEG Unit Care for Intensive Electroencephalography Monitoring. The record fulfilled by means of surface electrodes placed according to 10 20 International System with additional electrodes based on 10-10 System adapted ones for record of the temporal basal region and sphenoidal ones. In 12 patients, subdural electrodes were necessary.
Results: On critical clinical analysis, 158 seizures were recorded of which, the most frequent type was focal complex. Speaking on percentages, 82 of patients presented aura (36.1 gastric). The level of conscienceaccents disorder appeared in almost 100 (94.3), being more precocious than the automatisms in the majority of the sample. For automatisms, the most frequent and precocious was the oromandibular. On having analyzed our information we meet a low percentage of distonyc contralateral position that it might turn explained by the criterion used to consider as such to the sign. On bioelectrical analysis: Intercritical: epileptiform activity 87.9. Sharp wave 93.1. Increase with sleepness 97. Polyspikes in dream 21.2. Bilateral activity 21.2. Critical activity: more precocious EEG activity 69.1. Type beginning: levelling 46, rhythmic slow activity 41.7. Focal 48.9 (posterior lateral temporary 16.5, frontotemporal 15.1).
Conclusions: Detailed knowledge of clinical and electrical manifestations of temporal lobe epilepsies would allow a precocious diagnosis and a reduction on accessing time of these patients to surgical treatment in case of farmacological resistence.

P24-8
Connectivity characterization of mesial temporal epileptic seizures us-

and perform adequate signal preprocessing such as linear detrending of each subsegment.
Support: CInAPCe-FAPESP.

P24-9
Extended seizure detection algorithm for intracranial EEG recordings

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Objective: We implemented and tested an existing seizure detection algorithm for scalp EEG (sEEG) with the purpose of improving it to intracranial EEG (iEEG) recordings.
Method: iEEG was obtained from 16 patients with focal epilepsy undergoing work up for resective epilepsy surgery. Each patient had 4 or 5 recorded seizures and 24 hours of non-ictal data were used for evaluation. Data from three electrodes placed at the ictal focus were used for the analysis. A wavelet based feature extraction algorithm delivered input to a support vector machine (SVM) classifier for distinction between ictal and non-ictal iEEG. We compare our results to a method published by Shoeb in 2004. While the original method on sEEG was optimal with the use of only four subbands in the wavelet analysis, we found that better seizure detection could be made if all subbands were used for iEEG.
Results: When using the original implementation a sensitivity of 92.8% and a false positive ratio (FPR) of 0.93/h were obtained. Our extension of the algorithm rendered a 95.9% sensitivity and only 0.65 false detections per hour.
Conclusion: Better seizure detection can be performed when the higher frequencies in the iEEG were included in the feature extraction. Our future work will concentrate on development of a method for identification of the most prominent nodes in the wavelet packets analysis for optimization of an automatic seizure detection algorithm.

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