

Seras-EEG trial: technical correlation between conventional EEG recording and the mjn-SERAS device for subsequent analysis by an artificial intelligence-based system for seizure early detection.

G Torres-Gaona¹, R López¹, D Blázquez², X Raurich², J Valls², L Munsó², B Coscolluela², A Trejo³, A Gómez-Ibáñez⁴

¹Corachan Clinic, Neurosciences, Barcelona, Spain, ²MJN neuroserveis, Blanes, Spain, ³Synaptia Health Projects, Barcelona, Spain, ⁴Clínica Universitaria de Navarra, Neurology, Pamplona, Spain

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Purpose: mjn-SERAS is an earpiece shaped as a hearing-aid device, which continuously records the electrical brain activity. It uses an algorithmn artificial intelligence (AI)-based system for early detection of seizures. Seras-EEG trial study the correlation between conventional EEG records and mjn-SERAS to identify preictal and interictal segments in drug-resistant epilepsy patients.

Method: We studied a group of 16 patients with drug-resistant focal epilepsy and 14 controls. Both groups used mjn-SERAS, that records two channels in the external auditory canal and simultaneously performed EEG 24-channel recordings using the 10-20 system. Subsequently we extracted data from channels F8-T4 or F7-T3, according to the laterality of the epileptic focus. We analyzed the average correlation (AC) between the two types of records, with and without artefact removal, filtered records (FR), comparing inter-subject and subjects recordings (SR), as well between ictal and interictal periods in epilepsy patients.

Results: We obtained an AC of 88,2% (CI95% 86.6 - 89.8) in no FR; 90,2% (CI95% 89.0 - 91.4) in FR and 90,1% (CI95% 88.1 - 92.1) in SR. In cases group, an AC of 89,3% (CI95% 87.6 - 91.0) in FR and 89,5% (CI95% 86.6 - 92.4) in SR; controls results included 91,1% (CI95% 89.2 - 93.0) in FR and 90,7% (CI95% 88.3 - 93.1) in SR. Results distributed by ictal periods with AC of 88,0% (CI95% 83.3 - 92.7) and interictal periods of 89,4% (CI95% 87.6 - 91.3). The results support an adequate correlation between the information recorded with both methods.

Conclusion: Seras-EEG trial provides technical support for use of the mjn-SERAS to record EEG signal compared to the gold standard. A prospective, multicentre, pilot clinical trial is currently in progress to evaluate the mjn-SERAS in real life to anticipate seizures and describe improvements in different areas of personal development of epilepsy patients. **Acknowledgment:** International multidisciplinary consortium funded by EIT

Keyword 1: Ictal

Keyword 2: Interictal

Keyword 3: artificial intelligence

Keyword 4: Earpiece

Keyword 5: EEG correlation

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