

# 00014

## Artificial intelligence system, based on mjn-SERAS algorithm, for early detection of seizures in patients with refractory focal epilepsy: a cross-sectional pilot study

### Seizure forecasting

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### Background

The seizure prediction could help to improve safety, reduce patient anxiety, increase independence and allow acute treatment. Over the past years, the use of artificial intelligence and machine learning algorithm techniques has increased significantly in different health conditions including epilepsy. The main aim of this study is to determine if the artificial intelligence algorithm (developed by MJN Neuroserveis) is able to early detect accurately seizures in previously diagnosed epilepsy patients based on a video-EEG training set.

### Materials & Methods

A retrospective, observational, multicenter study to determine the sensitivity and specificity of the artificial intelligence algorithm. We selected 50 patients from 3 Spanish centers, diagnosed of refractory focal epilepsy, recordings from 3 to 5 days, a minimum of 3 seizures per patient. The algorithm identifies preictal and interictal patterns from EEG data using personalized models for each patient.

## Results & Conclusions

A total of 1,963 hours, with an average per patient of 39.26 hours. The v-EEG monitoring registered 309 epileptic seizures according to the posterior analysis of the epileptologists from each patient. The mjn-SERAS algorithm employed 119 seizures only to train algorithms and 188 seizures were used for the test split. This model showed 10 false negatives and 22 false positives. Specifically, the AI algorithm achieved 94,7% of sensitivity, 92,2% F-Score and a PPV of 91% with 0.55 false-positive detections (FPs)/24 hours in the patient-independent model.

Our model showed a high performance, both in terms of sensitivity and false positive rate. Furthermore, the training of the algorithm and the calculation of new samples have a high computational requirement in specialized cloud servers, but a light computational load in real-time, which allows its implantation in embedded devices for online seizure prediction.

