SEVERITY: Quantifying the severity of generalized tonic-clonic seizures (GTCS) with connected devices

Institution: Service de Neurologie, CHUV, Lausanne

Objective: GTCS are not all the same, and it is likely that the most severe types of GTCS are associated with higher risks of seizure-related hazard, including SUDEP, and greater impact on patients' quality of life. By bringing together the fields of seizure detection and that of SUDEP, the current project aims at delineating which set of biosensors and related biomarkers would optimally characterize the severity of GTCS and the associated risk of SUDEP. Our goal is not to validate the value of a specific device, or to compare the performance of various devices, but to collect the most informative biosignals from the state-of-the-art CE-marked devices.

Methods: A cohort of 270 patients with active epilepsy, undergoing VEEG monitoring in one of the participating epilepsy centers will be enrolled in this study with the aim to record epileptic seizures for routine clinical. In addition, the patient will be equipped with

- a wristband: The E4 from Empatica, which is a certified CE-marked medical device and measures heart rate (HR), accelerometry (ACC), electrodermal activity (EDA) and skin temperature.
- Surface EMG: biceps surface EMG will be performed using standard surface EMG electrodes used in clinical routine, which signal will be recorded through the VEEG recording system.

We will then evaluate which of the biosignals considered, or any of their combinations, offers the most accurate detection and quantification of our primary indicator of GTCS-severity, i.e. postictal EEG suppression (PGES).

In search of partners: Yes

IRB approval: Approved, CER-VD 2019-00437

Current status: recruitment ongoing

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