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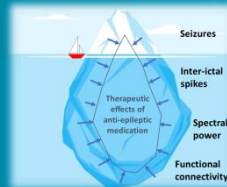
Rationale: In clinical practice, the choice of antiseizure drug (ASD) is often not guided by efficacy considerations but rather by ease of use and side effect profile related to the specific patient. An EEG biomarker that allows assessing whether or not a patient will respond to a specific ASD, without the need for waiting for the next seizure, would allow to decide more quickly how to continue therapy.

Method: Compare the performance of clinical information and extracted interictal EEG features to predict treatment response to levetiracetam.

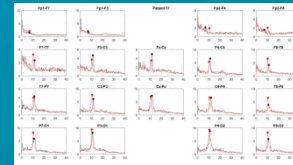
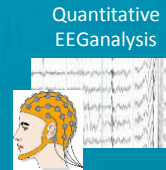
74 patients after a first seizure included



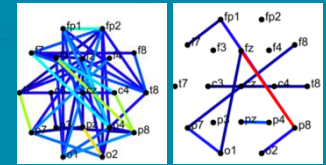
Clinical information + seizure diary is tip of the iceberg



What lies underneath the iceberg?



EEG spectral analysis



Functional connectivity

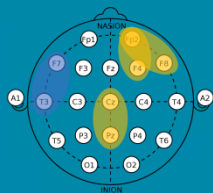
Results: EEG derived features allow to predict treatment efficacy of levetiracetam, while clinical information does not.

Clinical information



error rate: 46%

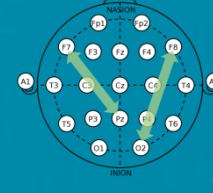
EEG spectral quantification



More delta energy + lower delta peak in responders compared to non-responders

ACC validation set	ACC test set
79% [67-89%]	74% [46-92%]

EEG functional connectivity



More connectivity in responders compared to non-responders

ACC validation set	ACC test set
84% [73-92%]	64% [36-86%]

Conclusion: This retrospective study shows the potential of an EEG biomarker indicative of the efficacy of ASD treatment with high accuracy. Nevertheless, prospective studies are needed to assess the added value of the developed EEG biomarker in a clinical setting.