

EXCITATION/INHIBITION IMBALANCE IN MIGRAINE PATIENTS ASSESSED BY ELECTROENCEPHALOGRAPHY

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Background. Migraine has been linked to an imbalance between excitation and inhibition (E/I) at both electrophysiological and molecular levels [1]. The exponent of the aperiodic component of the power spectrum of the electroencephalography (EEG) signal is regarded as a proxy of the E/I balance in human brain [2] and can be assessed in a non-invasive and cost-effective way.

Methods. We recorded resting-state activity with 32-channel cap EEG in 11 migraine patients and 8 healthy controls. We extracted the exponent of the aperiodic fit of the power spectrum computed on source-reconstructed signals down-sampled to 68 regions of interest (ROI) according to Desikan-Killiany atlas. Group comparisons were performed, followed by 5,000 random permutations and FDR correction.

Results. We observed a steeper slope of the aperiodic component of the power spectrum in several cerebral ROIs, including left entorhinal cortex, left fusiform gyrus, left isthmus of the cingulate gyrus, and left parahippocampal gyrus.

Conclusions. These preliminary data show evidence of abnormal E/I balance from EEG recordings of migraine patients. Reduced excitability is particularly concentrated in ROIs belonging to left medial temporal regions and implicated in the Default Mode Network.