Application of EEG Wavelet Power to Prediction of Antidepressant Treatment Response

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Abstract : In clinical practice, the selection of an antidepressant often degrades to lengthy trial-and-error. In this work we employ a normalized wavelet power of alpha waves as a biomarker of antidepressant treatment response. This novel EEG metric takes into account both non-stationarity and intersubject variability of alpha waves. We recorded resting, 19-channel EEG (closed eyes) in 22 inpatients suffering from unipolar (UD, n=10) or bipolar (BD, n=12) depression. The EEG measurement was done at the end of the short washout period which followed previously unsuccessful pharmacotherapy. The normalized alpha wavelet power of 11 responders was markedly different than that of 11 nonresponders at several, mostly temporoparietal sites. Using the prediction of treatment response based on the normalized alpha wavelet power, we achieved 81.8% sensitivity and 81.8% specificity for channel T4.

Keywords : alpha waves, antidepressant, treatment outcome, wavelet

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