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EEG-SOURCE ESTIMATES AND VIGILANCE REGULATION IN OBSESSIVE
COMPULSIVE DISORDER IN COMPARISON TO HEALTHY CONTROLS

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Neurophysiological hyperactivation of cortical and subcortical brain areas has been reported in obsessive-compulsive disorder (OCD) using functional imaging techniques and electroencephalography (EEG). Also sleep disturbances and delayed sleep phases have been associated with OCD symptomatology. However, vigilance regulation in OCD during the transition phase from wakefulness to sleep onset remains unclear. Therefore the aim of this study was to analyze EEG-source estimates and EEG vigilance regulation in OCD patients in comparison to healthy controls.

A 15 minute resting EEG was recorded in 30 unmedicated OCD patients and 30 healthy, age and gender matched controls. EEG power source estimates of the whole time series were computed by exact Low Resolution Brain Electromagnetic Tomography (eLORETA). Each consecutive one second EEG-segment was classified into one out of seven EEG-vigilance stages (0, A1, A2, A3, B1, B2/3, C) using Vigilance Algorithm Leipzig (VIGALL). The eLORETA analysis (log of F-ratios, $p < 0.05$, corrected for multiple comparison) revealed significantly increased delta power in the right superior frontal gyrus for OCD patients in comparison to healthy controls. Vigilance analysis yielded significantly increased amounts of high vigilance stage A2 (Mann-Whitney test, $p < 0.001$, corrected for multiple comparison) for OCD patients.

This study repeated findings of altered EEG-power in frontal areas in OCD patients. Alterations of EEG-vigilance regulation were found with increased amounts of high vigilance stage A2. This is in line with a hypothesis of cortical hyperactivation in OCD. The value of EEG-vigilance as a possible biological marker for e.g. treatment response should be focus of further studies.