IMPACT OF EEG-VIGILANCE ON BRAIN GLUCOSE UPTAKE MEASURED WITH $[^{18}F]$FDG-PET IN PATIENTS WITH DEPRESSIVE EPISODE OR MILD COGNITIVE IMPAIRMENT

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Introduction: $[^{18}F]$fluorodeoxyglucose positron emission tomography ($[^{18}F]$FDG-PET) is a standard method for the examination of the cerebral glucose metabolism of patients with affective disorder or memory impairment.

Aims: Building upon previous neuroimaging studies, we supposed an association between electroencephalogram (EEG)-vigilance and normalized brain $[^{18}F]$FDG-uptake (nFDGu) as measured by $[^{18}F]$FDG-PET. For the first time, the present study exploratively investigated this association in a routine diagnostic work-up.

Methods: A simultaneous EEG $[^{18}F]$FDG-PET under resting conditions was acquired from 14 patients with depressive episode or mild cognitive impairment (MCI). EEG-vigilance was automatically classified by using the VIGALL algorithm (Vigilance Algorithm Leipzig). A nonparametric voxelwise simple linear regression with vigilance measure as predictor and nFDGu as criterion was performed using Statistical nonParametric Mapping toolbox.

Results: The main finding was a significant negative correlation between vigilance measure and nFDGu in bilateral frontal and temporal regions, bilateral cingulate gyrus and right thalamus.

Conclusions: Brain regions associated with EEG-vigilance partly overlapped with regions of impaired glucose metabolism in depression and MCI, as reported by previous studies. Vigilance-associated underestimation or overestimation of brain glucose uptake might reduce sensitivity and specificity during the routine diagnostic application of $[^{18}F]$FDG-PET.