

How Do Age-related White Matter Changes Such as MRI Hyperintensities and Amyloid Deposition Relate to ECT Outcome in Late Life Depression?

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The treatment of late-life depression (LLD) using electroconvulsive therapy (ECT) in the elderly is complicated by the presence of age-related brain structural changes that may affect the underlying biophysical mechanisms of the treatment. For example, previous research has shown that the presence of medial temporal lobe atrophy (MTA) and white matter hyperintensities (WMH) on MRI is associated with poor ECT response and increased transient cognitive impairment following ECT. Recent advances in neuroimaging methods allow more precise quantification of regional brain volumes, white matter (WM) micro- and macrostructure and WM lesion load, as well as in vivo detection of Alzheimer's disease pathology using amyloid PET imaging. Such measurements may have predictive potential for stratifying patients with respect to the efficacy of ECT and its potential cognitive side effects.

In this presentation we review strategies for investigating WM changes associated with ECT in the elderly, and present findings from our longitudinal, multimodal, neuroimaging research employing quantitative structural MRI morphometry and ¹⁸F-Flutemetamol PET (an amyloid imaging technique), to investigate how quantitative measurements of WM lesion volume, WM macrostructure, hippocampal volume and amyloid deposition relate to clinical assessments of ECT response in a large cohort of treatment resistant LLD patients.