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Connectivity affecting the antidepressant response in late life depression (the CAARE study)

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Late-life depression (LLD) is characterized by differences in connectivity within and across intrinsic functional networks. How functional connectivity patterns at baseline may influence response to antidepressant treatment has not been robustly studied in a placebo-controlled trial in LLD. Ninety-five depressed elders completed baseline assessments and resting-state functional MRI prior to randomization to either escitalopram up to 20mg daily or identical placebo (2:1 allocation) for 8 weeks. Using a brain atlas parcellated by functional connectivity networks, we selected regions of interests as seeds for seed-to-seed connectivity analyses. Primary analyses tested whether interactive effects between functional connectivity patterns, treatment allocation, and time were associated with subsequent change in depression severity (measured by MADRS). Significant interactions associating connectivity to MADRS severity over time were present in the anterior Default Mode Network, specifically between the right-mPFC and left-rostral ACC and between the right-mPFC and right-rostral ACC. We also observed significant statistical interactions involving connectivity of the hippocampus, specifically between the PCC and right-hippocampus, the PCC and left-hippocampus, and between the left-hippocampus and subgenual ACC. Response to antidepressants in LLD is related to functional connectivity patterns in the anterior and posterior DMN hubs, limbic network, and hippocampus. Clinical translation of these findings is needed.

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