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The effects of accelerated brain aging on the antidepressant response in late-life depression

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Late-life depression is associated with markers of accelerated brain aging, but the clinical value of this finding is unclear. We examined whether a brain-based measure of accelerated aging predicted antidepressant response in a randomized controlled trial of depressed elders. We applied a machine-learning approach that estimated brain age from structural MRI data in 95 older adults with current major depression (MADRS) and intact cognition (MMSE.) Adults. The machine-learning model estimated brain age from MRI data, which was compared to chronological age to determine the brain-age gap (BAG; estimated age-chronological age). Participants were randomized 2:1 to flexibly-dose escitalopram vs. placebo, with MADRS repeated at two-week intervals. The primary outcome of interest was the interaction of BAG by time on MADRS. BAG was not associated with response to treatment at any time point. Unexpectedly, in one secondary outcome, larger BAG was associated with remission in patients receiving escitalopram rather than placebo. BAG does not appear to predict antidepressant response in older adults, and older-appearing brains in the setting of intact cognition are not clearly less responsive to antidepressant treatment.