Does Cognition Predict Treatment Response and Remission in Psychotherapy for Late-Life Depression?

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Objectives: *To identify cognitive predictors of geriatric depression treatment outcome.* **Method:** *Older participants completed baseline measures of memory and executive function, health, and baseline and post-treatment Hamilton Depression Scales (HAM-D) in a 12-week trial comparing psychotherapies (problem-solving vs. supportive; N = 46). We examined cognitive predictors to identify treatment responders (i.e., HAM-D scores reduced by ≥50%) and remitters (i.e., post-treatment HAM-D score ≤10).* **Results:** *Empirically derived decision trees identified poorer performance on switching (i.e., Trails B), with a cut-score of ≥82 predicting psychotherapy responders. No other cognitive or health variables predicted psychotherapy outcomes in the decision trees.* **Conclusions:** *Psychotherapies that support or improve the executive skill of switching may augment treatment response for older patients exhibiting executive dysfunction in depression. If replicated, Trails B has potential as a brief cognitive tool for clinical decision-making in geriatric depression.* (Am J Geriatr Psychiatry 2015; 23:215–219)

Key Words: Intervention, depressed, older adults, cognitive predictors, treatment outcome, psychological treatments

Mood disorders, particularly major depressive disorder, afflict 2.6% of older Americans[1] and are associated with cognitive impairment, particularly executive dysfunction.[2] The ubiquity of acute and persistent cognitive deficits in late-life depression and the high rate of treatment-resistant depression among older patients has led to concern regarding the negative impact of cognitive deficits on treatment outcome.[3] Problem-solving therapy (PST), a behavioral intervention adapted to target depression in older individuals with executive dysfunction, demonstrates efficacy in these patients.[4] In addition, supportive therapy (ST), a person-centered psychological intervention, shows efficacy for late-life depression with executive function deficits, but to a lesser degree than PST.[4]

It is imperative for geriatric clinicians to identify older patients who may have a better response to psychological treatments for depression and those requiring more intensive or qualitatively different treatment approaches. Previous studies have derived useful clinical decision-making trees that identified factors such as early treatment response and other psychiatric symptoms to predict post-treatment response in older patients with depression enrolled in pharmacotherapy.[5] Using this same approach, we investigated baseline cognitive abilities as predictors of post-treatment response and remission of late-life depression in a psychotherapy trial.[6]

METHODS

The current study examined data from a subset of participants selected to complete baseline neuropsychological tests in a previously described 12-week randomized control trial for late-life depression—psychotherapy (PST and ST) in the Collaborative Psychotherapy Study for Executive Dysfunction and Depression (COPED).[6]

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Selection criteria and measures for the trial are described elsewhere.[6] In brief, participants were 60 years or older and met criteria for major depression as established by the Structured Clinical Interview for DSM.[7] The study excluded individuals with the following histories: substance use disorders, bipolar disorder, psychotic disorders, and dementia or a positive screen for dementia. The trial also excluded individuals currently enrolled in psychotherapy or antidepressant treatment, at high risk for suicide, with an Axis I disorder other than unipolar depression and generalized anxiety disorder, current use of drugs known to cause depression, history of head trauma, and current acute and severe medical illness. The study measured depression from baseline to 12 weeks with the Hamilton Rating Scale for Depression (HAM-D[8]). Forty-nine participants randomized to psychotherapy (ST or PST) were selected to complete additional neuropsychological testing to that done in the parent trial. Three partipants were missing HAM-D scores at week 12, leaving a total of 46 participants.

Participants completed measures of mental and physical health (The Quality Metric Short Form 36-item Health Survey; SF-36[9]), learning and memory (Hopkins Verbal Learning Test—Revised; HVLT-R[10]) and executive functioning. Executive functioning measures assessed abstract reasoning (Wisconsin Card Sorting Task[11]), attention (Trail Making Test; TMT, Part A[12]), switching (TMT Part B[12]), and verbal fluency (Controlled Oral Word Association Test[13] and animal naming[14]).

Statistical Analysis

We derived decision trees to identify cognitive and therapeutic predictors of treatment response and remission for psychotherapy and pharmacotherapy using signal detection software for receiver operator characteristics (ROCs).[15–17] The software examines multiple predictor variables of a single outcome variable using an iterative analysis. This produces a hierarchical output of subgroups based on empirically derived cut-scores with the best sensitivity and specificity for detecting the target outcome using a p value of 0.01. The process repeats, resulting in additional subgroups until predictors are no longer significant. We defined treatment response as a 50% or more decrease in the 24-item HAM-D total score from baseline to post-treatment (yes/no), and treatment remission as a total score of 10 or less on the 24-item HAM-D at post-treatment (yes/no). A post hoc analysis examined whether predictors of remission remained significant using more stringent definition of remission based on recent studies (HAM-D total score of 6 or less). Baseline variables examined as predictors of response and remission in the ROC analyses included: demographics (age, sex, education, ethnicity), treatment type (PST versus ST or nortriptyline versus paroxetine), depression (HAM-D), health (SF-36 mental and physical health functioning), and cognition (memory and executive functioning).

TABLE 1. Baseline Characteristics of 46 Older Participants Enrolled in Psychological Treatment for Depression, M (±SD) or N (%)

Participant Characteristics	
Age, years	70.78 (7.3)
Education, years	15.78 (2.5)
Female sex	30 (65.2)
Ethnicity	
American Indian/Alaskan	3 (6.5)
Asian	5 (10.9)
Black	5 (10.9)
Pacific Islander/Hawaiian	1 (2.2)
White	32 (69.6)
Mental health (SF-36)	33.10 (9.4)
Physical health (SF-36)	41.16 (12.3)
Memory (HVLT; no. of words)	7.27 (3.3)
Executive functioning	
Animal fluency (Animals; no. of words)	16.41 (5.4)
Letter fluency (COWAT; no. of words)	36.85 (14.3)
Attention (TMT-A; time in sec)	46.83 (24.3)
Shifting (TMT-B; time in sec)	125.90 (68.8)
Abstract reasoning (WCST; no. of categories)	1.83 (1.6)
Depression severity (HAM-D)	
Baseline	22.54 (2.7)
12-week	12.76 (6.1)

Notes: SF-36: The Quality Metric Short Form 36-item Health Survey; HVLT: Hopkins Verbal Learning Test—Revised; Animals: Animal Naming task; COWAT: Controlled Oral Word Association Test; TMT-A: Trail Making Test Part A; TMT-B: Trail Making Test Part B; WCST: Wisconsin Card Sorting Task; HAM-D: Hamilton Depression Scale.

SF-36 Mental and Physical Health component summary scores have a possible range of 0 to 100, with higher scores indicating higher functioning. Due to missing data, the sample size for the HVLT = 45 and for the TMT-A, TMT-B, WCST = 41.

RESULTS

Table 1 presents demographic characteristics of participants in the treatment trial. Figure 1 shows the clinical decision tree generated from the ROC analyes.