A Condensed Version of Computerized Neurocognitive Testing Can Differentiate Between Controls, Depression, Mild Cognitive Impairment, and Dementia

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Background: Computerized neurocognitive testing can be useful in separating controls from dementia patients.

Objective: We hypothesized that a shortened version of a computerized neurocognitive battery, CNS Vital Signs, would be able to differentiate between age-matched controls and early dementia patients (MMSE 19-23). Further, we hypothesized that performance on these tests would significantly differ between controls, depressed patients, and Mild Cognitive Impairment (MCI) patients.

Methods: This was a cross-sectional study with 820 age-matched subjects: 521 controls, 113 with major depression, 118 with MCI, and 68 with dementia. Stepwise discriminant function analysis was used to find the best tests to separate controls from dementia patients, and performance on these tests was consolidated into a new variable, DEMFAC. Controlling for race, gender, education, computer familiarity, and motor speed, DEMFAC scores were compared across controls, and major depression, MCI, and dementia patients.

Results: A combination of tests of verbal and visual memory, the Stroop Test, the Continuous Performance Test, and the Perception of Emotions Test was best able to differentiate controls from dementia patients in this sample, with an effect size of 2.2. Performance on DEMFAC was significantly different between controls, major depression patients, MCI patients, and dementia patients ($p<0.0001$).

Conclusion: A shortened version of a computerized neurocognitive battery (DEMFAC) may be useful in differentiating age-matched controls from early dementia patients, and performance on DEMFAC was worse in patients with putative risk factors for dementia such as MCI and major depression compared to controls. DEMFAC may have clinical utility and should be tested prospectively.