Usefulness of Discriminability and Response Bias Indices for the Evaluation of Recognition Memory in Mild Cognitive Impairment and Alzheimer Disease

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Abstract

Background: Most studies examining episodic memory in Alzheimer disease (AD) have focused on patients' impaired ability to remember information. This approach provides only a partial picture of memory deficits since other factors involved are not considered. Objective: To evaluate the recognition memory performance by using a yes/no procedure to examine the effect of discriminability and response bias measures in amnestic mild cognitive impairment (a-MCI), AD dementia, and normal-aging subjects. Methods: We included 43 controls and 45 a-MCI and 51 mild AD dementia patients. Based on the proportions of correct responses (hits) and false alarms from the Rey Auditory Verbal Learning Test (RAVLT), discriminability (d′) and response bias (C) indices from signal detection theory (SDT) were calculated. Results: Results showed significant group differences for d′ ($F(2) = 83.26$, $p < 0.001$), and C ($F(2) = 6.05$, $p = 0.00$). The best predictors of group membership were delayed recall and d′ scores. The d′ measure correctly classified subjects with 82.98% sensitivity and 91.11% specificity. Conclusions: a-MCI and AD dementia subjects exhibit less discrimination accuracy and more liberal response bias than controls. Furthermore, combined indices of delayed recall and discriminability from the RAVLT are effective in defining early AD. SDT may help enhance diagnostic specificity.

Keywords

Alzheimer disease, Memory, Mild cognitive impairment, Recognition discriminability, Signal detection theory.