

BACKGROUND & OBJECTIVE

Behavioral variant of frontotemporal dementia (bvFTD) is a clinical syndrome in which personality, social comportment, and cognition progressively deteriorate (Bertoux, O'Callaghan, Flanagan, & Hornberger, 2016; Rascovsky et al., 2011). These symptoms arise from frontotemporal lobar degeneration (FTLD) associated with varied pathologies (Rascovsky et al., 2011; Mackenzie 2010).

Behavioral or cognitive symptoms may include: (1) behavioral disinhibition that may lead to socially inappropriate behavior, loss of manners/decorum, or impulsive actions; (2) apathy or inertia that may cause increased withdrawal from family activities; (3) loss of empathy that may lead to problems in interpersonal relationships; and/or (4) executive/generation deficits that may negatively impact problem solving or judgment in everyday life.

In the current pilot study, we compared judgment ability in a clinical sample of older adults with mild cognitive impairment (MCI), mild and mild-moderate Alzheimer's disease (AD), and bvFTD.

METHODS

We utilized retrospective data from a memory disorders clinic in the Midwestern U.S. (N = 109) and assessed differences in judgment ability across patient groups. We utilized the Test of Practical Judgment (TOP-J), which measures judgment related to common safety, medical, social/ethical, and financial issues (Rabin et al., 2007). The TOP-J is used by neuropsychologists in the U.S. and abroad and has shown strong psychometric evidence of validity, including significant correlations with brain regions associated with executive functioning (Rabin et al., 2009).

We also investigated whether differences in TOP-J scores were consistent across other areas of executive functioning, including attention/processing speed and initiation (i.e., RBANS coding and DKEFS phonemic fluency), based on available data. We also explored whether specific TOP-J items were qualitatively different between those with AD and bvFTD

Procedure: Participants were recruited from a clinical sample assessed between 2018 and 2019. Diagnoses were established during a multidisciplinary team conference. Participants were classified into three groups: MCI (n = 48), AD (mild and mild-moderate severity, n = 39), and bvFTD (n = 22) based on neuropsychological, geriatric, and social work evaluations, considering both cognitive and functional status, and following established criteria.

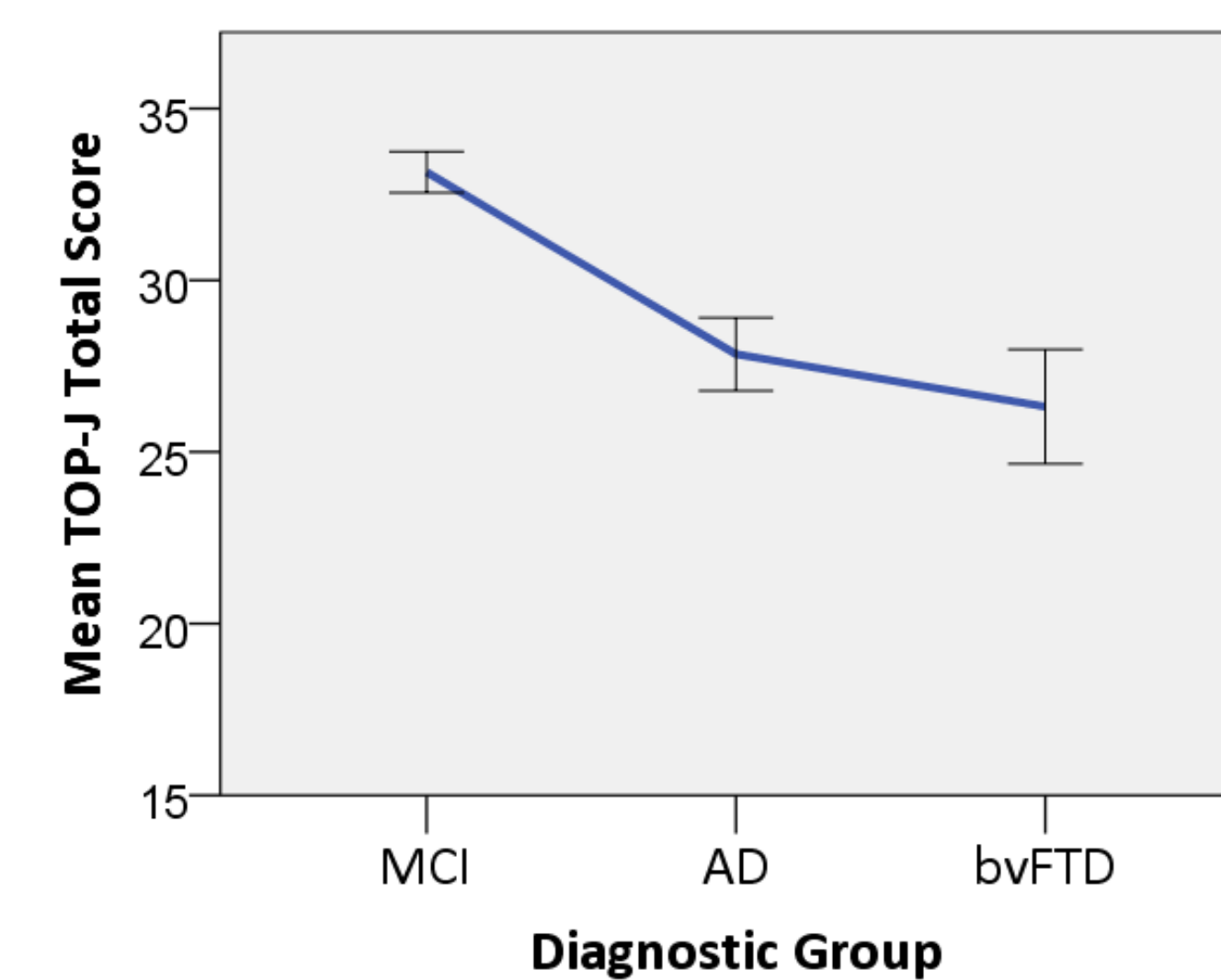
- The MCI group included multidomain (n = 13), amnesic (n = 17), nonamnesic (n = 10), unspecified (n = 5), PD (n = 1), vascular (n = 1), AD-VaD (n = 1) specifications.
- The AD group included mild severity (n = 26) and mild-moderate severity (n = 13).
- The bvFTD group included bvFTD (n = 16), bvFTD with Primary Progressive Aphasia (PPA) (n = 4), bvFTD with parkinsonism (n = 1), and bvFTD with vascular dementia (VaD) (n = 1).

TABLE 1. DEMOGRAPHIC CHARACTERISTICS

	MCI M (SD)	AD M (SD)	bvFTD M (SD)
n (N = 109)	48	39	22
Age (yrs)	77.38 (7.27)	80.33 (6.33)	76.05 (7.52)
Educ. (yrs)	14.00 (2.58)	13.31 (1.84)	13.77 (2.11)
Gender M(F)	18 (30)	7 (32)	11 (11)
TOP-J 15-item (/45)	33.15 (4.16)	27.85 (6.64)	26.32 (7.82)
TOP-J 9-item (/27)	19.42 (2.87)	16.64 (4.35)	15.68 (4.84)
RBANS Coding (/89)	31.50 ^a (8.31)	29.36 (8.77)	22.84 ^b (9.70)
DKEFS Letter Fluency	29.98 ^c (9.79)	29.13 ^d (9.67)	24.23 (10.19)

^a: n = 40; ^b: n = 19; ^c: n = 47; ^d: n = 38 (sample sizes vary slightly due to missing data).

FIGURE 1. TOP-SCORES PER DIAGNOSTIC GROUP



Note. Error bars represent standard error. The TOP-J 15-item scores were used.

RESULTS

Mean TOP-J total score decreased from MCI (n = 48, M = 33.15, SD = 4.16) to AD (n = 39, M = 27.85, SD = 6.64) to bvFTD (n = 22, M = 26.32, SD = 7.82). There was a statistically significant difference in TOP-J scores between diagnostic groups, Welch's $F(2, 46.348) = 14.258, p < .001, \text{est. } \omega^2 = 0.20$.

Games-Howell post hoc analysis revealed that the decrease in judgment from MCI to bvFTD [-6.83, 95% CI (-11.23 to -2.43)] was statistically significant, $p = .002$, as was the decrease from MCI to AD [-5.30, 95% CI (-8.23 to -2.37)], $p < .001$. However, the decrease observed from AD to bvFTD was not significant, $p = .722$.

A similar pattern was observed for attention (as measured by RBANS coding), as processing speed decreased from MCI (n = 40; M = 31.50, SD = 8.31) to AD (n = 39; M = 29.36, SD = 8.77) to bvFTD (n = 19; M = 22.84, SD = 8.67). Again, there was a statistically significant difference between diagnostic group: $F(2, 86) = 9.70, p < .001, \omega^2 = 0.10$.

Tukey post hoc analysis revealed that the decrease in processing speed from MCI to bvFTD [-8.66, 95% CI (-14.48 to -2.84), $p = .002$] was significant, as was the decrease from AD to bvFTD [-6.52, 95% CI (-12.36 to -.68), $p = .025$]. The difference between MCI and AD was not significant, $p = .526$.

There was no significant difference between diagnostic groups for phonemic fluency: $F(2, 104) = 2.691, p = .073$.

The 15-item version of the TOP-J was used for these analyses; however, analyses were repeated with the 9-item version and results remained consistent.

Qualitatively, responses between those with AD and bvFTD differ. Answers from patients with AD tend to be less elaborate (i.e., brief without explanation). Answers from patients with bvFTD tend to have less social awareness and reflect impulsivity in their course of actions.

Sample responses from patients with bvFTD:

"You see a small, friendly dog with a collar alone on the sidewalk in your neighborhood. What would you do?"

- "leave it alone" or "keep walking"

"You meet two close friends for dinner at a new restaurant you've been excited about trying. Upon arrival, however, the manager explains that one of your friends cannot enter because he/she is dressed too casually. What would you do?"

- "go in with the friend that is appropriately dressed"

"You drive to a mall in a nearby city, and by the time you finish shopping it is dark outside. Your car is parked a great distance from the exit and there have recently been several muggings in the area. What would you do?"

- "walk anyway because they don't want to mess with me" or "I'm well equipped to handle it"

Sample responses from patients with AD:

"You are vacationing far from home and realize you don't have enough blood pressure pills for the entire trip. What would you do?"

- "not take it"

"You are diagnosed with a rare blood disease causing severe discomfort and cognitive deterioration. Your doctor explains that a new medical procedure can help cure the disease, but this procedure has a 10% mortality rate. Alternatively, a commonly used medication can provide relief of some symptoms. What would you do?"

- "take the medication"

"Your trusted financial advisor tells you that stocks will significantly decline in value over the next several years while bonds will rise in value. You currently own stocks but no bonds and have the opportunity to change your investment portfolio based on this advice. What would you do?"

- "trust my advisor"

CONCLUSIONS AND FUTURE DIRECTIONS

- Findings suggest that measures that tap varied aspects of executive functioning, such as attention/processing speed and practical judgment are important to include in the evaluation of patients suspected of having bvFTD. Specifically:
 - A coding task may be helpful in differential diagnosis between AD and bvFTD.
 - Impaired quantitative judgment ability and concerning qualitative responses to common everyday dilemmas may also help formulate a diagnosis of bvFTD.
 - The TOP-J may be particularly helpful in identifying patients at risk for exploitation or unsafe living situations based on qualitative responses. Such identification may help the provider support and protect the patient by planning with the patient's family.
- Limitations include a smaller sample size in the bvFTD diagnostic group, and mixed bvFTD syndromes, including a secondary PPA or comorbid VaD.
- Although not possible in this study due to sample size limitations, it may be important to investigate differences in judgment ability between amnesic and nonamnesic MCI.

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