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CLINICAL MANIFESTATIONS

POSTER PRESENTATION

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NEUROPSYCHIATRY AND BEHAVIORAL NEUROLOGY

Cognitive and neuroimaging trajectories in the behavioral variant of Alzheimer's disease

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Abstract

Background: The behavioral variant of Alzheimer's disease (bvAD) is a rare atypical presentationcharacterized by early and prominent behavioral changes, clinically akin to the behavioral variant of fronto-temporal dementia (bvFTD). The natural history of bvAD is poorly understood. This study investigates the progression of bvAD in a multinational cohort, comparing bvAD with matched bvFTD and typical AD (tAD) groups.

Method: We analyzed 81 bvAD participants from four centers and matched them by age, sex, and education to bvFTD (n = 80), tAD (n = 81), and controls (n = 78). Participants completed longitudinal clinical assessments and underwent repeated structural MRI. We combined neurocognitive variables into domain-specific composites. Furthermore, we extracted cortical thickness and volumetric MRI data using FreeSurfer andcomputed atemporal AD-signature and a frontal region-of-interest. Linear mixed models were used to evaluate cognitive and neuroimaging trajectories. The model coefficients are presented as standardized (β), and the effect is assessed through estimated marginal means (EMM).

Result: Demographic features are shown in Table 1. Subjects with bvAD exhibited significant decline in executive function (β=-0.62, 95%CI[-1.02, -0.22], p = 0.03, EMM=-0.19), memory (β=-1.62, 95%CI[-1.90, -1.33], p < 0.001, EMM=-0.49), language (β=-0.95, 95%CI[-1.31, -0.59], p < 0.01, EMM=-0.18), and visuospatial function (β=-0.80, 95%CI[-1.31, -0.28], p < 0.05) compared to controls. Compared to bvFTD, individuals with bvAD showed relatively greater memory (p = 0.005) and language (p = 0.04) preservation over time, while no significant differences were observed in visuospatial function (p = 0.65) or executive function (p = 0.4). In contrast,

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bvAD did not differ significantly from tAD in memory (p = 0.1), language (p = 0.6), visuospatial function (p = 0.99), or executive function.

Individuals with bvAD exhibited significant decline in the AD-signature (β=-0.91, 95%CI[-1.34, -0.48], EMM=-0.49) and frontal (β=-0.66, 95%CI[-1.16, -0.15], EMM=-0.29) regions-of-interest compared to controls. Compared to tAD, no significant differences were found in both regions of interest (p = 0.61, p = 0.91). Compared to bvFTD, individuals with bvAD showed significantly greater atrophy in the AD-signature regions (p = 0.02) and significantly less atrophy in frontal lobe (p = 0.03).

Conclusion: The progression of bvAD differs both cognitivelyand anatomically from bvFTD, while showing a progression pattern that is very similar to tAD. These results underscore the importance of investigating AD pathology in the context of cognitive-behavioral decline.

	Controls n=78	bvAD n=81	bvFTD n=80	tAD n=81	p
sex (%F)	28%	26%	25%	33%	0.99
Age at first assesment *mean(sd)*	64(6)	65(7)	64(8)	65(6)	0.7
Age of onset mean(sd)		62(7)	60(8)	61(7)	0.6
Disease duration at first assement *mean(sd)*		3.7(2.2)	3.6(2.9)	4(1.9)	0.83

Table 1. Demographic features.

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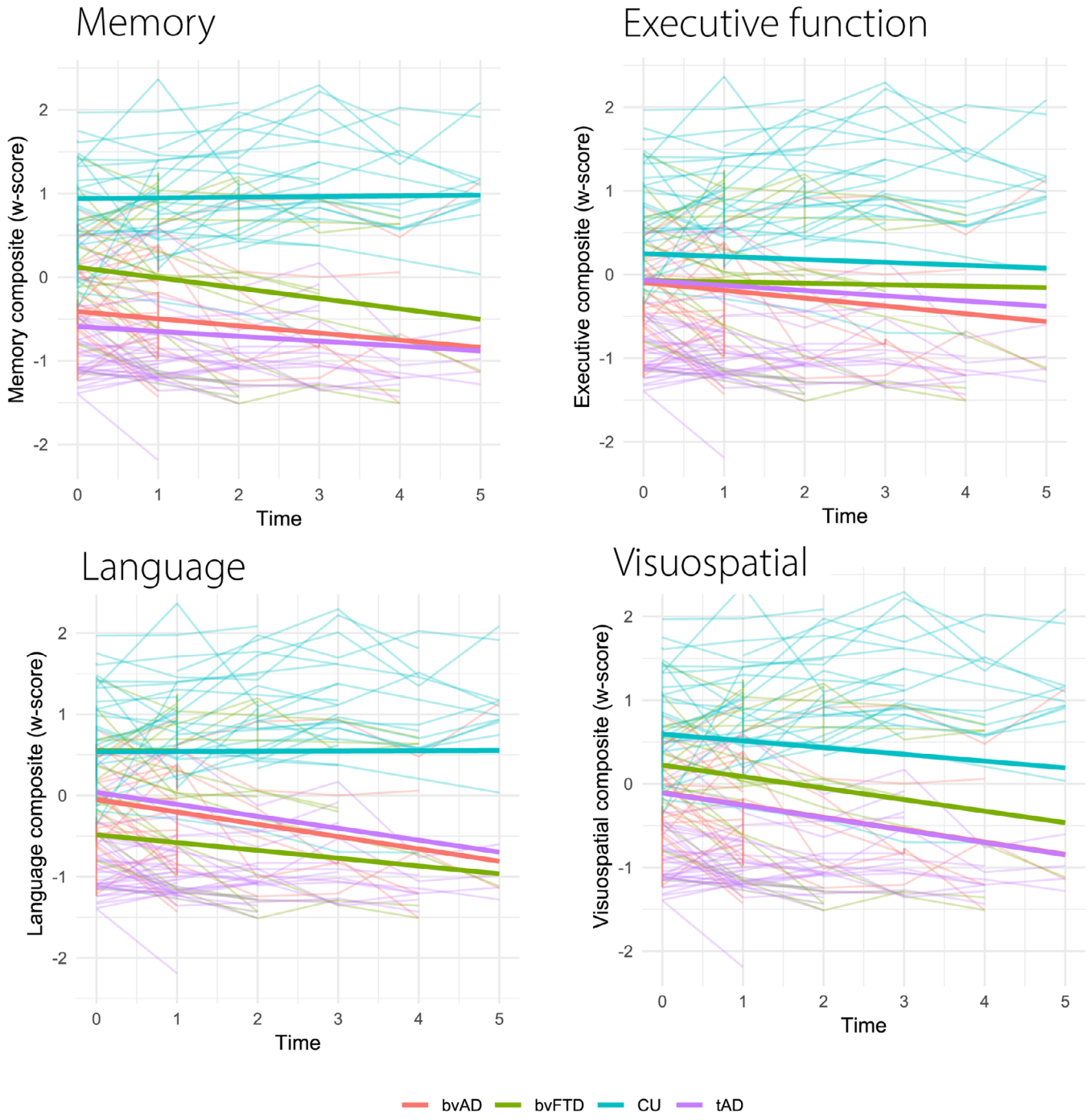

Figure 1. Cognition. Group comparison of cognitive composite scores over time

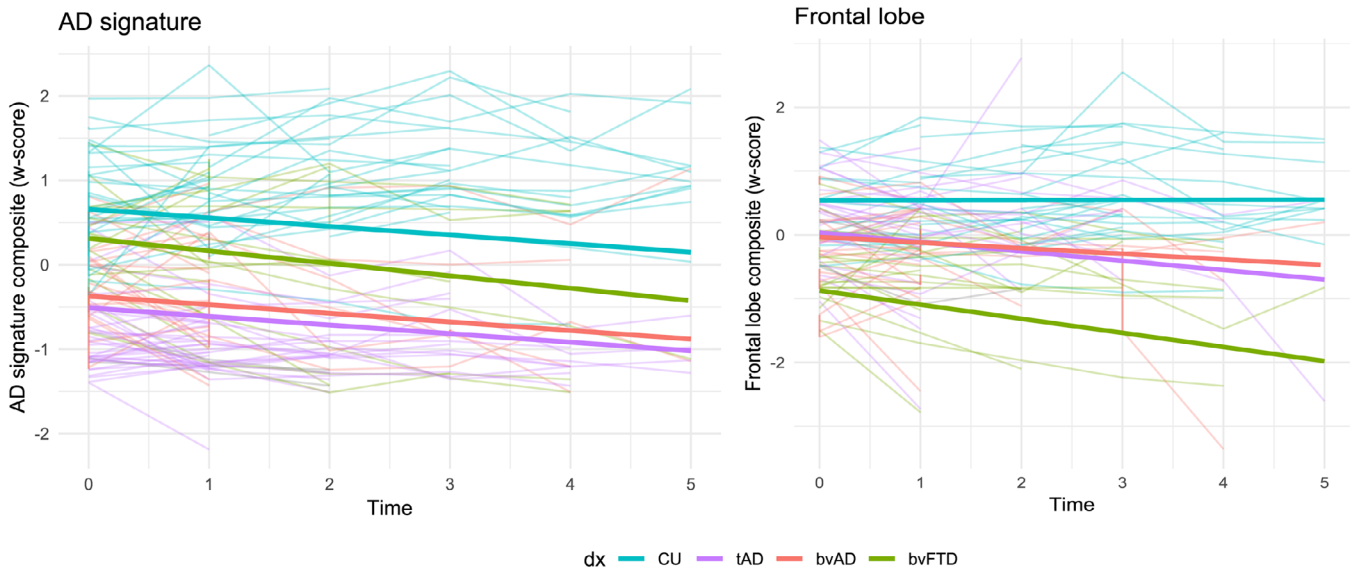

Figure 2. Group comparison of brain atrophy over time