Prevalence and neurocognitive basis of delusions in dementia

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BACKGROUND & AIMS

- Delusions refer to *"fixed beliefs that are not amenable to change in light of conflicting evidence".*
- Delusions and abnormal belief formation have been reported in some people with dementia, however, the prevalence of delusions in dementia and their neurocognitive basis has been underexplored.

Here, we aimed to examine the prevalence, severity and neural correlates of delusions in a large, diverse cohort of dementia patients.

METHODS

The FRONTIER dementia clinic database was reviewed for all patients with: i) informant-rated Neuropsychiatric Inventory (NPI); ii) brain MRI, iii) cognitive assessment

487 dementia patients were eligible: 102 Alzheimer's disease (AD), 136 behavioural-variant frontotemporal dementia (bvFTD), 53 semantic-variant primary progressive aphasia (sv-PPA), 51 nonfluent-variant PPA (nfv-PPA), 50 logopenic-variant PPA (lv-PPA), 29 frontotemporal dementia-motor neurone disease (FTD-MND), 46 corticobasal syndrome (CBS), 20 progressive supranuclear palsy (PSP).

DELUSIONS- (n = 30):
Disease control group matched to Delusions+ patients according to diagnosis, disease severity and demographics

DELUSIONS+ (n = 30):
Patients reported as having delusions at least often on the informant-rated NPI

CONTROLS (n = 30):
For comparison with Delusions+ and Delusions- groups on cognitive and neuroimaging assessments

Fig 1. Recruitment and analysis plan for the study cohort.

PREVALENCE OF DELUSIONS

10% of patients experienced delusions at presentation.

The highest prevalence was observed in bvFTD (5%) and AD (2.4%). Within diagnoses, 18.4% of bvFTD, 13.8% of FTD-MND and 11.8% of AD patients were reported as experiencing delusions at presentation.

The most common type of delusion was persecutory, followed by delusions of reference and then delusions of jealousy. Delusion type did not differ between diagnoses (p = .99).

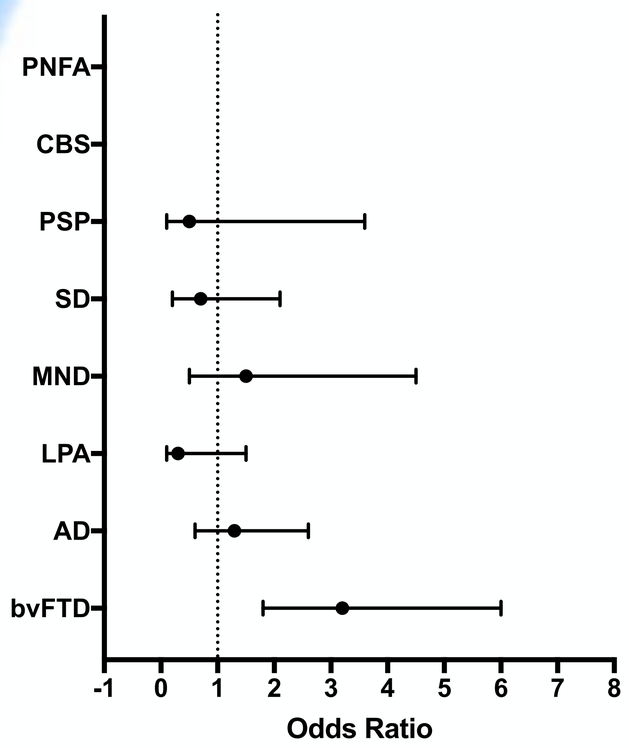

Fig 2. Odds ratio for delusions according to diagnosis.

DELUSIONS+ VS. DELUSIONS-

Delusions+ vs. Delusions-

Behavioural profile

↑ Impairments in everyday skills
↑ Stereotypical behaviours
↑ Sleep disturbances
↑ Memory problems
↑ Mood disturbances
↑ Hallucinations

Cognitive profile

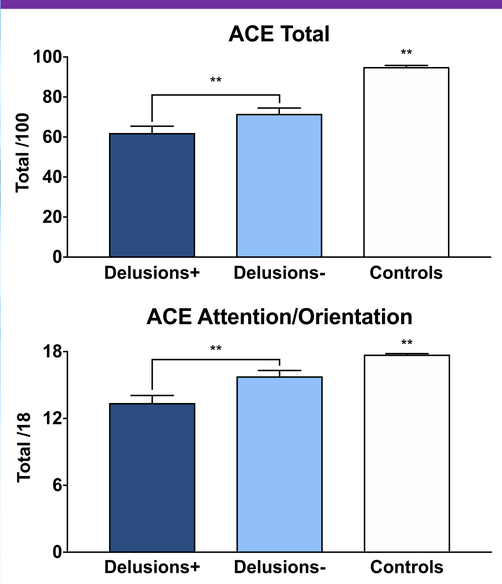

Fig 3. Cognitive profile of the study cohort (Controls > Patients, $^{**}p < .001$).

↓ Memory (ACE Memory; RCF Recall)
↓ Language (SYDBAT Repetition)

Neuroimaging:

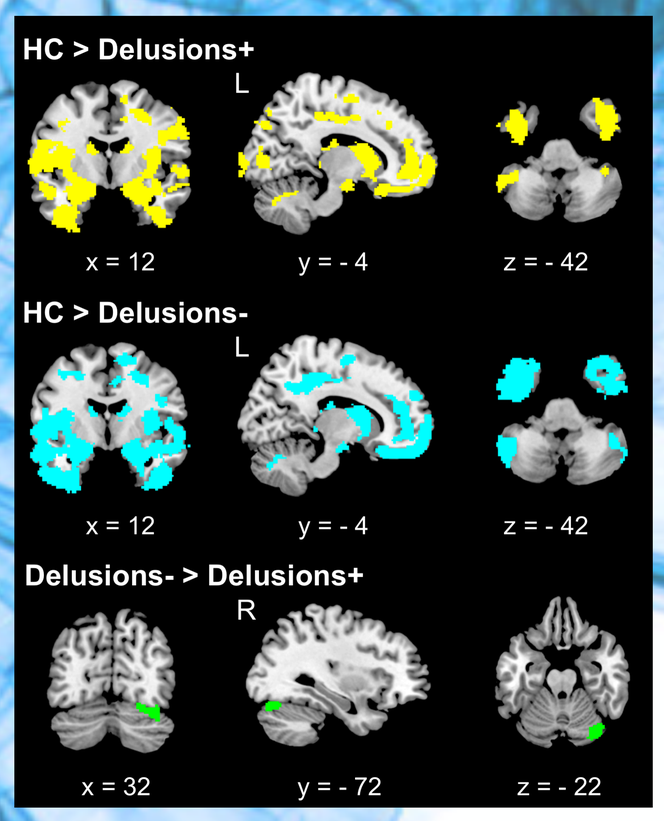

Fig 4. Patterns of atrophy in patients with and without delusions.

Both groups showed widespread patterns of atrophy compared to controls.

The Delusions+ group showed greater atrophy of the cerebellum (Crus I), right lateral occipital cortex and right inferior fusiform gyrus compared the Delusions- group.

NEURAL CORRELATES

↑ **Delusions**: ↓ left middle and inferior temporal gyri, temporooccipital fusiform, medial frontal cortex, left middle and inferior frontal gyri, angular gyrus, supramarginal gyrus and septum pellucidum.

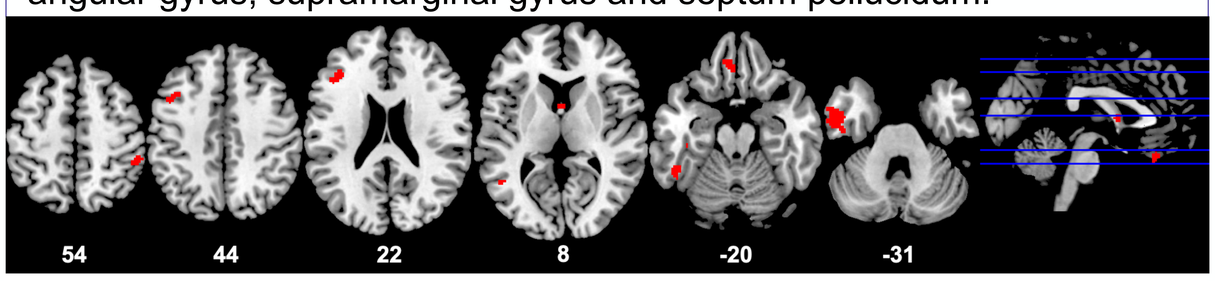

Fig 5. VBM results in patients with delusions.

CONCLUSIONS

- Our results reveal that delusions are most common in bvFTD and AD, and relatively rare in other syndromes.
- Both the cognitive and clinical profile of patients with delusions differs, and suggest possible mechanisms for the emergence of delusions in these syndromes[1].
- Recognition of these complex neuropsychiatric symptoms is essential to improve management of patients with dementia, and also helps to inform neurobiological models of delusional beliefs.

[1]Darby, R.R., Laganiere, S., Pascual-Leone, A., Prasad, S., & Fox, M.D. (2017). Finding the imposter: brain connectivity of lesions causing delusional misidentifications. *Brain,* 140(2), 497-507.

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