

Apathy and disinhibition associated with salience and cognitive control network morphometric similarity across dementias

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State of the art: Apathy and disinhibition are common and highly distressing neuropsychiatric symptoms of dementia that are extremely difficult to treat. We examined relationships between structural brain networks and these symptoms in behavioral variant frontotemporal dementia (bvFTD) and dementia of the Alzheimer's type (DAT).

Methodology: Participants were 157 individuals with DAT (n=94; 36 female) or bvFTD (n=63; 22 female) from the Alzheimer's Disease Neuroimaging Initiative and the Frontotemporal Lobar Degeneration Neuroimaging Initiative. Apathy and disinhibition were identified using the Neuropsychiatric Inventory Questionnaire. Freesurfer calculated 7 statistics (e.g. volume, thickness) per brain region from T1-weighted MRIs. Pairs of regions were correlated to produce within-subject morphometric similarity networks for 3 major functional networks: the salience (SN), cognitive control (CCN) and default mode networks (DMN). We calculated Transitivity (network segregation) and Global efficiency (network integration) for each network.

Results: ANCOVAs found that SN transitivity and SN global efficiency were lower in individuals with apathy compared to those without. SN transitivity was also lower in DAT than bvFTD. Individuals with disinhibition had lower CCN global efficiency than those without. There was an interaction of disinhibition and diagnosis for SN global efficiency, with higher SN efficiency in bvFTD without disinhibition. Spearman correlations with disinhibition severity were significant for SN global efficiency, CCN transitivity and CCN global efficiency.

Conclusion: Our transdiagnostic study found that the presence and severity of symptoms were associated with structural network similarity, independently of clinical diagnosis. This finding has implications for treatment, particularly those focused on modifications of brain networks.

Conflicts of interest

N/A