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Thursday

Examining the neural substrates and behavioral correlates of poor driving in Frontotemporal Dementia

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State of the Art: Studies suggest that 90% of families report driving changes in patients with frontotemporal dementia (FTD) and 50-60% of even mild FTD patients fail driving evaluation. One study on a small group of patients with FTD also showed worse driving performance in a simulator compared to normal controls. However, no studies have examined associations between poor driving and specific behavioral or neuroanatomical changes.
Methodology: 96 patients with behavioral and language variant FTD completed a driving simulator as part of their enrollment in research at the Cognitive Neuroscience Division of the National Institute of Neurological Diseases and Stroke. Associations on metrics from the driving simulator and Neuropsychiatric Inventory were explored. A sub-analysis on 44 individuals with FTD who also had completed magnetic resonance imaging examined whether brain regions previously associated with cognitive control might also be associated with worse driving performance. All models were corrected for age and sex.
Results: FTD patients had poor performance on the driving simulator across all metrics compared to previously reported controls. Patients with FTD who were not driving due to their own or family concern had significantly worse performance compared to patients who were driving. Driving FTD patients with more real-world traffic violations had more traffic light tickets on the simulation. Worse driving performance was associated with higher disinhibition, apathy, agitation, and atrophy in regions of the prefrontal cortex.
Conclusion: Worse performance on a driving simulator was associated with real-world driving changes, specific behavioral changes, and prefrontal cortex atrophy in FTD patients.

Conflicts of interest

N/A