Investigating the use of the Ignite+ digital cognitive assessment app in the differential diagnosis of frontotemporal dementia

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Introduction

Cognitive assessments are important for detecting and diagnosing neurodegenerative disease. The Ignite+ app is a cognitive assessment tool designed for early detection and monitoring of frontotemporal dementia (FTD). It tests multiple cognitive domains and is a potentially useful tool for remotely assessing cognition in FTD and other neurodegenerative diseases but this requires further validation.

Aim

This study investigates the use of Ignite+ in the detection of cognitive changes in people with FTD compared to other dementias such as Alzheimer's disease (AD), and whether it is more sensitive to cognitive change than traditional pen and paper testing.

Method

- Participants were recruited from a specialist cognitive clinic across a range of diagnoses including bvFTD, svPPA, nfvPPA, lvPPA, AD, and PCA.
- Cognition was assessed using the MoCA followed by Ignite+ within the same session. Ignite+ comprises 18 tests across multiple cognitive domains, with speed/accuracy scores calculated for most tests.
- Participants were grouped into those with FTD (n=20) or AD (n=11) spectrum conditions and compared using corrected non-parametric tests (Mann–Whitney) with effect sizes calculated (rank-biserial correlation). Z-scores were generated using a matched control group (n=40) and compared against MoCA results.

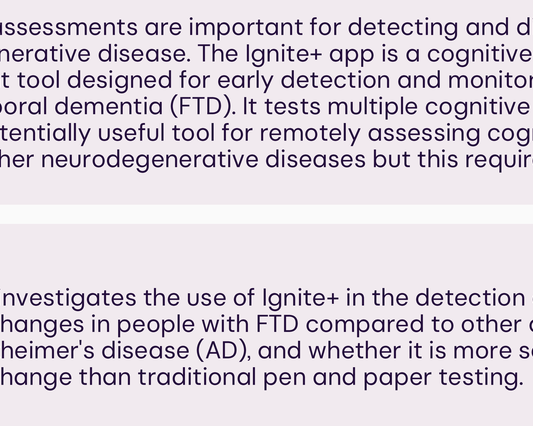

Figure 1: Examples of 6 Ignite+ tests (Colour Mix level 4, Swipe Out, Card Sort, Path Finder Level 2, Think Back Level 2 and Balloon Fair).

Results

- Significant differences between people with FTD and AD spectrum groups were found in 6 Ignite+ tests (r=0.56–0.71, p=0.016–0.035).

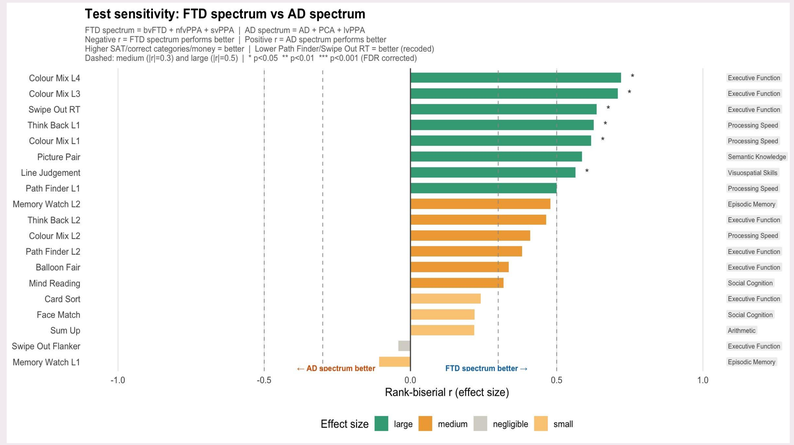

Figure 2: Bar chart testing the sensitivity of each Ignite+ test between FTD and AD spectrum diseases using effect size

Results

- Z-score analysis revealed people with AD and FTD performed similarly in arithmetic, with FTD performing slightly worse in executive function but better in episodic memory, visuospatial skills, social cognition, semantic knowledge and processing speed relative to the control group.

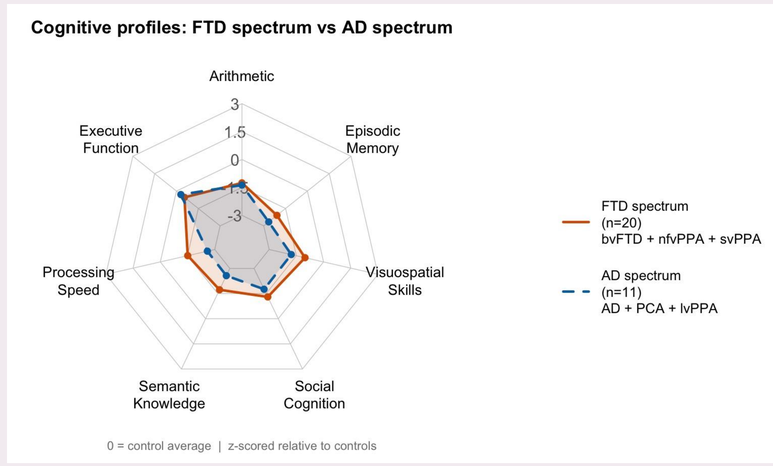

Figure 3: Radar Plot showing the difference in Z-scores between FTD and AD spectrum diseases for each cognitive domain.

Results

- Some people with FTD with a normal MoCA score (≥26/30) showed impaired Z-scores in semantic knowledge, social cognition, and episodic memory when doing Ignite+.

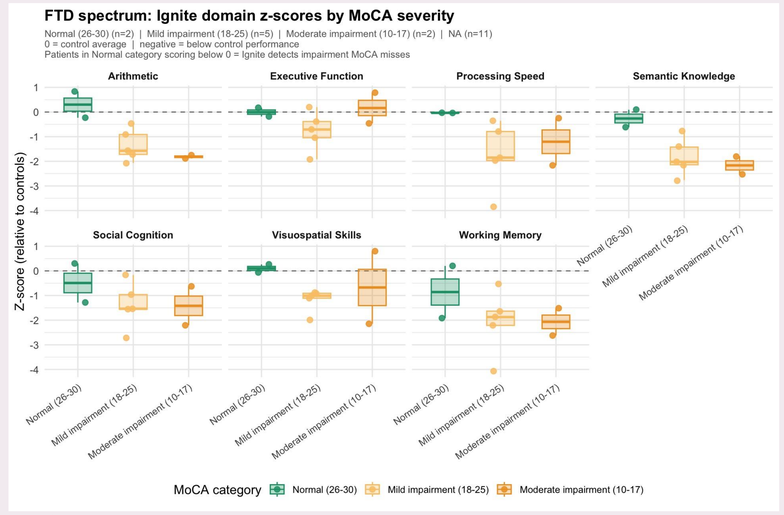

Figure 4: Box plots showing Z-scores for each FTD participant's cognitive domain compared to their MoCA scores

Conclusion

Ignite+ successfully detects cognitive differences between FTD and AD spectrum participants, though larger cohort validation is needed.

Ignite+ shows early promise in identifying mild cognitive impairments in semantic knowledge, social cognition, and episodic memory that traditional pen and paper tests may miss in the early stages of FTD.

Future Direction

As Ignite+ is validated as a digital cognitive assessment, we hope to utilise it to create participant tailored outputs that could be reviewed by clinicians and provide a visual representation of the patient's cognitive profile.

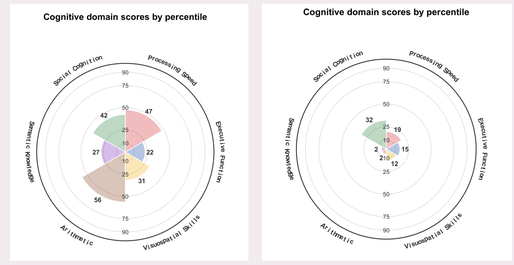

Figure 5: Radar Plot showing participant domain scores by percentile compared to a normal population.

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We thank the research participants for their contribution to the study. JDR has current funding from the Bluefield Project, the National Brain Appeal, the Rosetrees Trust, the Kissick Family Foundation and the NIHR UCL/H Biomedical Research Centre and has previously received funding from a Miriam Marks Brain Research UK Senior Fellowship, an MRC Clinician Scientist Fellowship (MR/M008525/1), the NIHR Rare Disease Translational Research Collaboration (BRC149/NS/MH), the MRC UK GENFI grant (MR/M023664/1), and the JPND GENFI-PROX grant (2019-02248). LCR is supported by a Career Progression Award from Alzheimer's Society UK (grant number 639). RC is supported by the Rosetrees Trust. PF is supported by an Alzheimer's Society PhD studentship. AB is supported by a GENFI studentship in association with the National Brain Appeal.

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