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BACKGROUND

- Dementia develops rapidly in PD: the 8 year prevalence being 78.2% (1) and in a recent study 27% of PD-MCI patients converted to dementia within 3 years (2).
- This is notably higher than the 4-6% incidence of Alzheimer’s disease (AD) up to 75 years, and the 5-10% annual conversion rate of MCI to AD; though most do not convert to AD within 10 years (3).
- While the reported incidences of MCI in the general population vary from 5 to 30%, the Mayo Clinic Study using published criteria found it to be 16% (4).
- The incidence of MCI in 8 PD cohorts was 25.8% (5) and the MDS task force review of 48 PD studies identified the incidence as 26.7% (6).
- Compared with AD, the more rapid development of dementia in PD, particularly in PD-MCI, suggests that these identified incidences of PD-MCI may be conservative.
- Although deficits to attention and information processing are notable in PD, automated tests designed to assess these domains are used sparingly in the field, and the present study sought to evaluate the incidence of PD-MCI including such measures.

METHODS

- Since Donders in 1668 (7) developed the first automated attention tests, simple reaction time (SRT) and choice reaction time (CRT), these have been the mainstay of attention testing in cognitive psychology, together with among others, vigilance tasks.
- The CDR System is an automated set of cognitive tests which has been used in approaching 1400 clinical trials since the 1980s.
- The CDR System has tests of attention (SRT, CRT, digit vigilance), working memory (articulatory & spatial) and episodic recognition memory (verbal and non-verbal). These tests can be performed in 16 minutes and their domain specificity has been confirmed by factor analysis.
- The CDR System was administered to 484 PD patients (mean age 66.7 yrs, SD 10.4) and the data compared to 1896 age-matched controls. The effect sizes of the impairments on various domains are presented in the Figure.
- The 2011 MDS Level 2 criteria for PD-MCI (8) were applied using cut-offs of 1, 1.5 & 2 SD for 4 domains: attention & information processing, working memory, episodic memory, and visuospatial.
- In the Table, MCI was also calculated for the individual domains using either accuracy or speeded measures.

RESULTS

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DISCUSSION & CONCLUSIONS

- Compared to controls, PD patients were most impaired on Power of Attention (the speeded measures from the attention tasks) with a very large effect size.
- Accordingly, attentional PD-MCI was most prevalent in this study, and previous work from our group has shown poor performance on the attention tests to predict subsequent cognitive decline (9) and falls (10).
- Aarsland et al (8) using a 1.5 SD cut-off identified 10% attentional PD-MCI, 13% amnestic, 11% visuospatial & compared to 59%, 15% & 51% respectively in this study.
- Confirmation that the speeded measures contributed to this higher detection rate came from the additional MCI classifications using either accuracy or speed scores.
- The authors find these higher rates of PD-MCI to be in line with the increased incidence and more rapid onset of dementia in PD than AD
- It is concluded that to definitively measure the range and extent of cognitive dysfunction in PD, the assessments should include automated domain specific tests which capture both speed and accuracy.

REFERENCES