Hallucinations in Parkinson's – who is vulnerable and can neuropsychological tests predict onset?

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Daisy Whitehead gained a psychology degree in 1999 and a doctorate in 2005 from the University of Liverpool. Her PhD investigated hallucinations in Parkinson's, in particular sleep-related symptoms and neuropsychological predictors. This work involved patients attending movement disorders clinics in North West England and working closely with local Parkinson's Disease Society branches. Daisy spent two years working as a post-doctoral researcher at University College, London, and is currently employed at the MRC Centre for Neurodegeneration Research at the Institute of Psychiatry, in London as a neuropsychologist investigating the non-motor symptoms of Parkinson's and of other neurodegenerative disorders, such as Alzheimer's disease.

Presentation abstract: Hallucinations in Parkinson's, which are mainly visual, can be distressing for both patient and carer and are associated with greater rates of institutionalisation, more advanced disease, cognitive decline and poor prognosis.

The study described in this presentation aimed to investigate neuropsychological and sleep-related correlates of hallucinations in Parkinson's and assess their predictive value using multiple regression.

Seventy-eight people were interviewed about their experiences of hallucinations during the previous three months and a 'visual hallucinations factor' score was derived for each. All participants underwent a battery of neuropsychological tests assessing domains such as executive function, memory and visual perception. They were also asked about their sleep symptoms in the previous three months.

A multiple regression model, with the hallucinations factor score as the outcome variable, was built using clinical factors initially followed by sleep variables and finally neuropsychological variables. This assessed the added predictive value of non-clinical variables in identifying those vulnerable to hallucinations. The first step was to measure disease severity using the Unified Parkinson's Disease Rating Scale (UPDRS)-III and Mini Mental State Examination (MMSE) score. This accounted for a 7.4% variance. Rapid eye movement (REM) behaviour disorder type symptoms and scores on the Epworth Sleepiness scale were selected in the second step using a stepwise selection method, with cumulative variance explained now at 19.9%. A third step selected two neuropsychological variables, 'visual misperception' and 'verbal intrusions'. The final model gave an R2 of 0.342 (34.2% variance; $p<0.001$).

The results of this study demonstrated that non-clinical variables, namely sleep symptoms and neuropsychological factors, improve prediction of vulnerability to hallucinations in Parkinson's over standard clinical measures, such as disease severity, medication dose and global cognitive status. Identifying those people who are vulnerable to hallucinations may allow earlier intervention and provision of targeted specialist care.