A Controlled Study of the Long-Term Cognitive Outcome of Bilateral Subthalamic Nucleus Deep Brain Stimulation

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OBJECTIVE

To assess neurocognitive functioning 2 years following subthalamic nucleus (STN) deep brain stimulation surgery (DBS) for the treatment of Parkinson’s disease (PD).

BACKGROUND

Long-term STN DBS cognitive outcome has shown declines in verbal fluency, verbal memory and visuospatial reasoning. However, results have been inconsistent across studies and a long-term comparison of DBS patients and matched PD patients utilizing a comprehensive neuropsychological battery has not been presented.

PARTICIPANTS

Twelve bilateral STN DBS patients and 14 matched PD patients underwent comprehensive neuropsychological assessment at baseline and 2 years post-surgery.

RESULTS

Groups were matched on age, age at PD onset, and baseline UPDRS motor scores. The STN-DBS group had significantly less education, longer duration of PD illness, and higher baseline dopaminergic medication usage. These variables were used as covariates in analyses for which they were significantly correlated with the outcome.

At the 2-year follow-up, STN-DBS patients demonstrated significant impairments in verbal memory (RAVLT-total; p=.01), oral information processing speed (SDMT; p=.02), and language (LF; p=.01 & BNT; p=.001) compared to PD patients.

33% of STN-DBS patients converted to dementia 2-years post-operatively compared to none of the PD participants.

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