Swallowing function in patients with Parkinson’s disease and Deep Brain Stimulation

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Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt förvar i Föreläsningssalen ÖNH, byggnad 1B plan 3, fredagen den 17 februari, kl. 09:00.

Avhandlingen kommer att förvaras på svenska.

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Abstract

Background: Swallowing problems in Parkinson’s disease (PD) are among the most critical attributes of the disease, as they are associated with aspiration pneumonia and are thereby the comorbidity with the highest mortality rate. Deep Brain Stimulation (DBS) is a surgical treatment option for PD, which improves the overall motor function and quality of life, but the effect on swallowing function is not clear.

Purpose: The purpose of this thesis was to contribute to the understanding of the effect of subthalamic nucleus (STN) DBS and caudal zona incerta (cZI) DBS on swallowing function and on swallow-specific quality of life in PD patients. In addition we wanted to examine the effect of cZI DBS on body weight changes, sialorrhea and speech problems.

Methods: Eleven PD patients with STN DBS (Paper I) and 17 patients with cZI DBS (Papers II-IV) were included. All patients were assessed preoperatively, and 6 and 12 months postoperatively. The effect of STN DBS and cZI DBS on swallowing, was evaluated with Fibre-optic Endoscopic Evaluation of Swallowing (FEES). Self-assessments were addressed using a visual analogue scale, and the Swallowing Quality of Life (SWAL-QOL) questionnaire (cZI DBS study group). Body weight changes and specific items from the Unified Parkinson’s Disease Rating Scale were also examined. Nine controls without PD were included in the sample in Paper IV, by answering the SWAL-QOL questionnaire.

Results: No clear effect of DBS on swallowing function or swallow-specific quality of life could be observed. There was no effect of the DBS on the occurrence of aspiration, secretions, pharyngeal residue or clearance in the samples with STN DBS or cZI DBS. Patients with STN DBS reported a subjective improvement in swallowing function with DBS stimulation turned on. The scores from the SWAL-QOL were overall high and unaffected by the cZI DBS. The SWAL-QOL total score was not significantly different between the PD patients and the controls, but the scores from the ‘burden’ and the ‘symptom’ subscales were worse in PD patients.

Conclusions: STN DBS or cZI DBS did not have a negative effect on swallowing function or swallowing-specific quality of life. Patients reported a self-perceived improvement in swallowing function with STN DBS. Patients with cZI DBS had an overall good swallow-specific quality of life and it was not negatively affected by cZI DBS. Since the sample sizes in these cohorts are small, the findings need to be confirmed in larger studies.

Keywords

Parkinson’s disease, swallowing, deep brain stimulation, subthalamic nucleus, caudal zona incerta, swallowing quality of life,