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Deep brain stimulation (DBS) can be very effective in alleviating tremor but adverse effects on speech are frequently reported, especially following bilateral DBS. Most of the existing literature on DBS and speech deals with the effects of DBS targeting the subthalamic nucleus or the ventral intermediate nucleus of the thalamus, which are the traditional targets for Parkinson’s disease and essential tremor, respectively. More recently, the posterior subthalamic area (PSA) has been highlighted as a particularly effective nucleus of the thalamus, which are the traditional targets for Parkinson’s disease.

**METHODS**

**BACKGROUND**

Three 16-word sentences (33–39 syllables) were treated with PSA-DBS for >12 months. Is bilateral chronic PSA-DBS worse for speech than unilateral PSA-DBS?

**OBJECTIVES**

- To what extent is speech function, and in particular articulation and voice, affected by chronic PSA-DBS?
- How is speech affected by unilateral high-amplitude stimulation?
- Is bilateral chronic PSA-DBS worse for speech than unilateral PSA-stimulation?

**RESULTS**

### Influenza of contact laterality

**Electrode location**

The electrode is located within the thalamus between the red nucleus and the STN at the depth where the red nucleus has its widest diameter.

### Auditory-perceptual assessments

Ratings of speech using VISOR by two SLPs.

### Stimulation adjustments and recording procedure

Recording procedure. OFF = off DBS, ON = on chronic DBS. 3.0–4.5 V = unilateral stimulation.

### Group–level results

Rated function ON and MAX

**Affected articulation + influence of contact laterality**

A cut-off value of ±8 was considered as a relevant difference in the STN at the depth where the red nucleus has its widest diameter.

### Bilateral vs. unilateral

**Individual outcomes**

Effects of PSA-implantation on speech and voice for individual participants. Note: B = chronic bilateral DBS, U = chronic unilateral left DBS, R = chronic unilateral right DBS.

### CONCLUSIONS

- Chronic PSA-DBS has no systematic adverse effects on speech function, including articulation and voice.
- Speech and voice outcomes are heterogeneous, but the effects of stimulation are generally small.
- High-amplitude stimulation from more medially placed electrodes worsens articulatory function.
- Unilateral (left) and bilateral stimulation may have similar effects on voice and speech.

**References**


**Umeå University**

Department of Clinical Science/ Section of Speech and Language Pathology, 901 87 Umeå Sweden, www.umu.se