

# Study of Orthostatic Regulation in Patients with Parkinson's Disease Receiving Deep Brain Stimulation

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## Objective:

To evaluate blood pressure (BP) and heart rate (HR) changes in patients with Parkinson's disease (PD) with deep brain stimulation (DBS) at different targets.

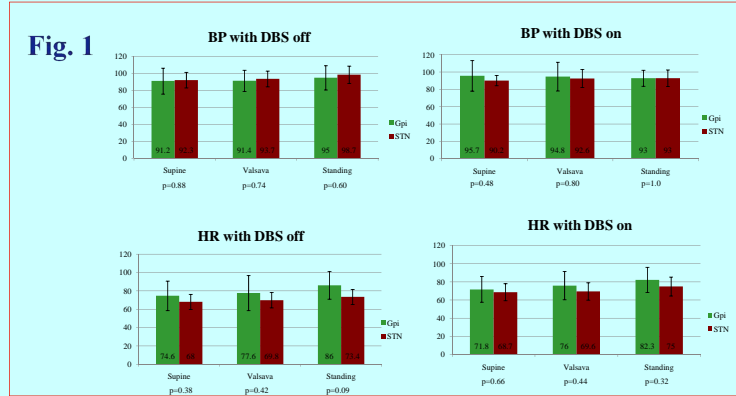
## Background:

Some studies suggested that DBS in PD patients may affect their autonomic functioning. Others showed beneficial effects on postural hypotension in PD patients with subthalamic nucleus (STN) DBS implantation. The impact of globus pallidus internus (GPi) DBS on orthostatic regulation has not been established. In this study, we evaluated the BP and HR changes in patients with different DBS target sites

## Design/Methods:

Patients were divided into two groups depending on their DBS targets (bilateral GPi vs. STN). Systolic, diastolic BP and HR were measured by a blinded investigator while patients were supine, standing or performing the Valsava maneuver. Two measurements were obtained with DBS on or off. Significance of the difference between the mean UA values of the two groups was analyzed by the Student's t-test.

Fig. 1



## Results:

- Eighteen patients were enrolled (8 patients in GPi group and 10 in STN group). There was no significant difference in mean BP, HR and orthostatic BP changes between the two groups. ( Fig. 1 and Fig. 2)
- While performing the Valsava maneuver, the GPi group had increased mean systolic BP while the STN group had decreased mean systolic BP (GPi: +8.4 mmHg; STN: -11.0 mmHg,  $p < 0.01$ ) ( Fig. 3)
- One patient with GPi DBS showed orthostatic hypotension when DBS was turned on. One patient with STN DBS had severe systolic BP decrease after DBS was turned on in both supine (-46 mmHg) and standing (-23 mmHg) positions.

Fig. 2

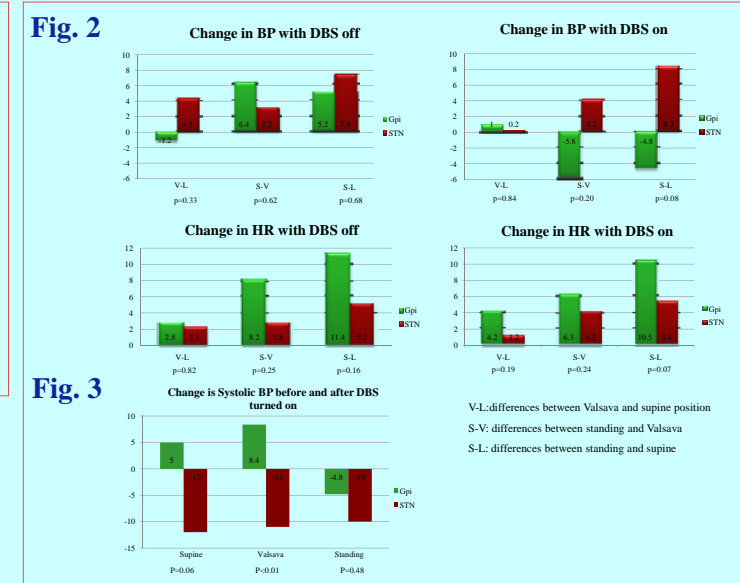


Fig. 3

## Conclusions:

DBS in PD patients may influence their orthostatic regulation. However, stimulation at different targets did not show significant difference based on our current preliminary data. A larger sample population and computerized autonomic testing will provide further information on the autonomic function changes after DBS.

**ACKNOWLEDGMENT:** This research was supported by the Department of Veterans Affairs.

