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## **SUBTHALAMIC DEEP BRAIN STIMULATION CAN IMPROVE CONSTIPATION AND OTHER BOWEL DYSFUNCTION IN PARKINSON'S DISEASE.**

### Hypothesis / aims of study

Parkinson's disease (PD) is a progressive neurodegenerative disease, mainly characterized by the loss of dopamine neurons in the substantia nigra pars compacta, culminating in motor symptoms. Furthermore, long term treatment with anti-parkinsonian medications produces motor fluctuation and motor complications at advanced stages of PD. In addition to motor dysfunction, there are a variety of non-motor symptoms associated with PD. Constipation and other bowel dysfunction are common non-motor dysfunctions of PD. Constipation, difficult defecation, and impaired colon and anorectal motility occur both in untreated and treated PD and might be one of the causes of bowel symptoms. The ideal strategy for the management of constipation and other bowel dysfunction remains uncertain. It is established that deep brain stimulation of the subthalamic nucleus improves motor function in advanced PD, but its effects on non-motor and autonomic function remain to be elucidated. Above all, to our knowledge it remains unclear as to whether subthalamic deep brain stimulation (STN-DBS) would be effective in improving constipation and other bowel dysfunction. Then, we investigate the effects of STN-DBS on constipation and bowel function.

### Study design, materials and methods

A total of 19 patients with PD who underwent bilateral STN-DBS were enrolled. We performed questionnaire of bowel symptom and colonic transit time (CTT) study before and 3 months, 1 year after the STN-DBS surgery. The CTT study was performed using the repetitive ingestion method. We counted the number of markers in each segment of the large bowel and then calculated the right CTT (normal values [hours]: mean, 6.9; range, 3.6-7.2), left CTT (14.1, 2.4-19.2), rectosigmoid CTT (18.0, 7.2-26.4), and total CTT (39.0, 16.0-48.0).

### Results

All patients had improvement of parkinsonism under STN-DBS ON and medication ON 3 months and 1 year after the surgery. Seventeen patients had both constipation and difficult defecation, and all of whom used some purgatives before surgery. Subjective improvement in bowel frequency was shown in 15 patients (88.2%) at 3 months post surgery and 10 (83.3%; n=12) at 1 year post surgery. And stop or dose reduction of purgatives in 7 patients (42.2%) at 3 months and 10 (83.3%; n=12) at 1 year post surgery. Improvement of the total CTT was shown in 15 patients (78.9%) at 3 months post surgery and 10 (83.4%; n=12) at 1 year post surgery. The right CTT, rectosigmoid CTT and total CTT were significantly decreased, but the left CTT was unchanged at both 3 months and 1 year post surgery (Total CTT: 70.4 hours [pre] to 57.8 [3M], 47.2 [1Y]).

### Interpretation of results

Improvement of constipation and difficult defecation, and stop or dose reduction of purgatives were shown in PD patients undergoing STN-DBS at 3 months and 1 year post surgery. And decrease in CTT was also shown in these patients at 3 months and 1 year post surgery.

### Concluding message

These results showed that STN-DBS can improve constipation and difficult defecation, resulting in stop and reduction of purgatives, and that one of the causes may be improvement of colon and anorectal motility possibly by altering the neural system that controls bowel function after STN-DBS.

### Disclosures

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