

(68%) had FOG. Duration of Parkinson’s disease symptoms was 12.6 years in patients with FOG and 9.3 years in those without FOG. The total UPDRS, UPDRS III–meds off, and UPDRS III–meds on scores were similar between patients with and without FOG at baseline. At baseline, the L-dopa equivalent daily dose was 1305.0 mg in the group with FOG and 1653.6 mg in the group without.

At 26 weeks after surgery, the mean total FOGQ score was reduced by >50%. STN-DBS lowered the number of patients with FOG, as defined by FOGQ Item 4, from 26 of 38 patients at baseline to 13 of 38 patients at 26 weeks. The occurrence of FOG as measured with UPDRS II Item 14 declined over 52 weeks. UPDRS III Item 29 results showed that STN-DBS improved gait in this cohort over 52 weeks.

STN-DBS significantly reduced FOG and improved gait in this cohort of patients with Parkinson’s disease. Further analysis of the videotaped walking tests might provide additional insights into the effects of STN-DBS on FOG, especially with respect to potential changes in different FOG subtypes and patterns.

## Motor and Nonmotor Symptoms of PD Improve With Exercise

Written by Toni Rizzo

Exercise increases neuron proliferation in animal studies and improves motor function in patients with early-stage Parkinson’s disease (PD). Multiple studies have demonstrated that the LSVT BIG® physical therapy exercise program is effective for improving the motor symptoms of PD. LSVT BIG is a program developed by LSVT Global that uses physical and occupational therapy in an intensive, whole-body, amplitude-based training protocol to treat individuals with PD. Khashayar Dashtipour, MD, PhD, Loma Linda University School of Medicine, Loma Linda, California, USA, presented the results of a pilot study comparing the effects of the LSVT BIG program with those of a one-on-one exercise program in patients with PD.

Nine patients with early- to middle-stage PD were randomly assigned to the LSVT BIG physical therapy exercise program (n=4) versus a one-on-one exercise program consisting of treadmill plus seated trunk and limb exercise (n=5). Both exercise programs took place in 16 1-hour supervised sessions. The goal was to compare the effects of each program on motor as well as on nonmotor symptoms in these patients with PD. The patients were assessed before and after the exercise intervention with the Unified Parkinson’s Disease Rating Scale (UPDRS), UPDRS motor (UPDRS M), Beck Depression Inventory

(BDI), Beck Anxiety Inventory, and Modified Fatigue Impact Scale (MFIS). The assessments were given at baseline (first evaluation) and monthly at 3 follow-up visits (second, third, and fourth evaluations). Follow-up data were compared with baseline data using Wilcoxon rank sum testing. The analysis was repeated separately for each of the assessments and for each evaluation period.

In the combined cohort of all 9 patients, all assessment results were improved from baseline at the follow-up evaluations, with statistically significant decreases in the UPDRS score at the second (p=0.0237), third (p=0.0361), and fourth (p=0.0142) evaluations. UPDRS M scores were significantly decreased from baseline at the third (p=0.0208) and fourth (p=0.0313) evaluations. BDI scores were significantly decreased at the second (p=0.0014), third (p<0.0001), and fourth (p<0.0001) evaluations. MFIS scores were significantly decreased only at the fourth evaluation (p=0.0022).

There were no significant differences between the LSVT BIG physical therapy and one-on-one exercise groups at any of the evaluations except for the MFIS score, which was significantly decreased from baseline to the fourth evaluation (-11.2 vs 0.0, p=0.0159) in the one-on-one exercise group compared with the LSVT BIG group. Changes from baseline to the fourth evaluation for the other assessments in the one-on-one exercise group compared with the LSVT BIG group are shown in Table 1.

Table 1. Change From Baseline to Fourth Evaluation, Both Groups

	One-on-One Exercise	LSVT BIG	p Value
UPDRS	-5.0	-8.3	0.4841
UPDRS M	-2.8	-6.8	0.2778
BDI	-2.0	-2.5	0.4524
BAI	-3.0	-0.5	0.2381
MFIS	-11.2	0.0	0.0159

BAI=Beck Anxiety Inventory; BDI=Beck Depression Inventory; MFIS=Modified Fatigue Impact Scale; UPDRS=Unified Parkinson’s Disease Rating Scale; UPDRS M=Unified Parkinson’s Disease Rating Scale motor.

The results of this pilot study demonstrated a positive effect of exercise and physical therapy on motor and nonmotor symptoms in patients with PD, with reductions in all scores from baseline. The only significant difference between the 2 groups was the significantly reduced MFIS score at the final evaluation in the one-on-one exercise group compared with the LSVT BIG group. The results of this pilot study suggest that one-on-one exercise could be at least as effective as the LSVT BIG physical therapy program for improving the symptoms of PD, but larger trials are needed to validate these data.