Supplementary document

Beneficial nonmotor effects of subthalamic and pallidal neurostimulation in Parkinson's disease

1. Results

1.1. Baseline characteristics in the original cohort

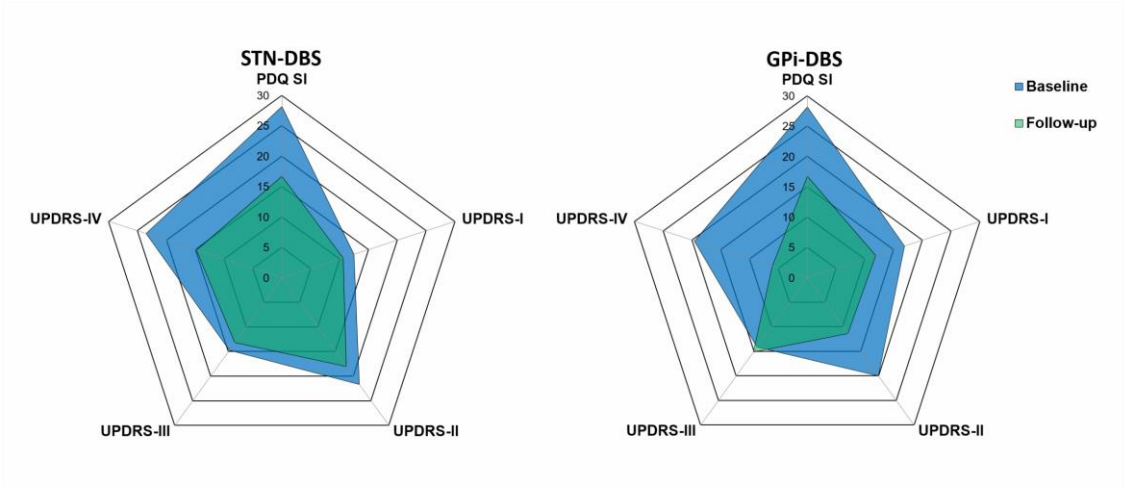
In the original cohort 60 patients with PD were included. Demographic characteristics were similar, Hoehn and Yahr Staging was slightly higher in the GPi-DBS group than in the STN-DBS group, and preoperative UPDRS-III MedON scores were significantly higher in the STN-DBS compared to the GPi-DBS group (p=0.023).

1.2. Changes of outcomes at follow-up in the original cohort

In both groups of the original cohort, PDQ SI, UPDRS-II, UPDRS-IV, Schwab and England Scale, and NMSS improved significantly from baseline to follow-up (for STN-DBS all p<0.001, for GPi-DBS all p<0.01) (Table e-1). As expected, LEDD reduction was approximately 51% in the STN-DBS group (p<0.001) and only approximately 10% in the GPi-DBS group (p=0.357). This difference of LEDD reduction was significant (corrected p<0.001). LEDD reduction was not significantly correlated to other outcome parameters. Post-hoc analyses of NMSS domain scores in the STN-DBS group, resulted in significant improvements of sleep/fatigue (p=0.002), mood/cognition (p=0.017), perceptual problems/hallucinations (p=0.007), urinary symptoms (p=0.012), sexual function (p=0.017), and the miscellaneous domain (p=0.003), which was driven by the items pain (baseline: 4.5 ±4.3; follow-up: 2.4 ±3.6; p=0.032) and olfaction (baseline: 3.9 ±3.7; follow-up: 1.7 ±2.8; p=0.017). In the GPi-DBS group, sleep/fatigue (p=0.004), mood/cognition (p=0.001), and sexual function (p=0.015) improved significantly at follow-up.

In the STN-DBS group, effect sizes (Table e-2) were ‘small’ for UPDRS-I and -III, ‘moderate’ for UPDRS-II, -IV, and NMSS, and ‘large’ for PDQ SI, Schwab and England Scale, and LEDD reduction. In the GPi-DBS group, effect sizes were ‘small’ for UPDRS-I, Hoehn and Yahr scale, and LEDD reduction, ‘moderate’ for Schwab and England Scale, and ‘large’ for PDQ SI, UPDRS-II, -IV, and NMSS. NNT results were favorable for STN-DBS regarding LEDD reduction, UPDRS-I, -III, and Schwab and England Scale (Table e-3). On the other hand, NNT results were better in GPi-DBS for UPDRS-II, -IV, Hoehn and Yahr Scale, PDQ SI, and NMSS. In both targets, PDQ SI change scores were significantly correlated to UPDRS-II and Schwab and England Scale change scores (all $p<0.05$) (Table e-4) and in STN-DBS, a significant correlation was also observed for NMSS change scores ($p=0.002$).

Supplementary figure – PDQ SI and UPDRS at baseline and follow-up in the matched cohort for subthalamic and pallidal stimulation



Abbreviations: GPi-DBS = Pallidal deep brain stimulation; **PDQ SI** = Parkinson’s Disease Questionnaire; **STN-DBS** = Subthalamic stimulation, **UPDRS** = Unified Parkinson’s Disease Rating Scale

Supplementary figure illustrates PDQ SI and UPDRS domains at baseline (blue) and follow-up (green) for the STN-DBS and GPi-DBS groups in radar charts.