



Health Related Quality of Life in Parkinson's Disease Patients Undergoing Deep Brain Stimulation

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OBJECTIVE

To determine the effect of subthalamic nucleus (STN) deep brain stimulation (DBS) on health-related quality of life (HRQoL) in Parkinson disease (PD) patients.

BACKGROUND

Several studies have concluded that DBS improves motor function in medically-refractory PD patients; less emphasis has been placed on HRQoL measures. We sought to capture clinically relevant endpoints with an emphasis on quality of life (QoL) using disease-specific instruments

METHODS

PD patients who underwent STN-DBS were assessed prospectively using several clinical scales at baseline and 6 months after implantation: Unified Parkinson's Disease Rating Scale (UPDRS), Lang-Fahn Activities of Daily Living Dyskinesia Scale (LF-ADL), Questions on Life Satisfaction Module (QLSm), EQ-5D, Mini-Mental Status Examination (MMSE), and Geriatric Depression Scale (GDS).

RESULTS

At total of 9 patients (5 male), age 57.2 ± 8.4 years, consented to be enrolled in this study. The UPDRS motor score (part III) improved by 36.3% ($p=0.02$) from baseline to 6 months in the medication off state (Table 1). The UPDRS total score (Part I-III) decreased 29.3% ($p=0.03$) at 6 months compared to baseline while off medications. During this same time, UPDRS dyskinesia severity decreased from 1.5 ± 1.4 to 0.4 ± 1.1 ($p=0.05$) while dyskinesia duration decreased from 1.7 ± 1.2 to 0.4 ± 0.5 ($p=0.08$). The LF-ADL scale improved significantly in total score from 13.9 ± 4.8 to 3.7 ± 3.9 ($p=0.01$) and in each individual subscore: handwriting ($p=0.04$), cutting ($p=0.06$), dressing ($p=0.01$), hygiene ($p=0.01$), and walking ($p=0.02$). Several portions of the QLSm improved significantly including QoL in relationship to general health ($p=0.01$), hobbies/leisure activities ($p=0.05$), energy/enjoyment of life ($p=0.01$), inconspicuousness of illness ($p=0.03$), and hand dexterity ($p=0.02$). The EQ5D "self care" score improved during the course of this study from 1.8 ± 0.4 to 1.3 ± 0.5 ($p=0.04$). On average, patients were "moderately" to "very satisfied" with several variables related to the neurostimulator: reliability, inconspicuousness, manipulation, and absence of false bodily sensations. Neither the GDS nor MMSE scores changed appreciably.

CONCLUSION

Improvements in motor function for PD patients undergoing STN-DBS translate into improved QoL using disease-specific clinical scales.

TABLE 1: Summary of Motor Endpoints at Baseline and 6 months after STN-DBS

	Baseline	6-month follow-up	Statistical significance: Baseline vs. 6 months
UPDRS I off medications	2.4 ± 1.7	1.5 ± 1.4	P=0.32
UPDRS I on medications	3.0 ± 1.2	1.75 ± 0.8	P=0.39
UPDRS II off medications	23.8 ± 2.0	17.8 ± 3.3	P=0.11
UPDRS II on medications	9.8 ± 2.1	7.4 ± 1.8	P=0.35
UPDRS III off medications	49.5 ± 4.8	31.5 ± 4.8	p=0.02
UPDRS III on medications	27.4 ± 6.6	17.0 ± 2.9	P=0.23
UPDRS Total (I-III) off meds	70.4 ± 18.3	49.8 ± 20.4	p=0.03
UPDRS Total (I-III) on meds	37.2 ± 16.3	25.0 ± 7.2	p=0.23
UPDRS Dyskinesia Duration (question 32)	1.7 ± 1.2	0.43 ± 0.53	p=0.08
UPDRS Dyskinesia Severity (question 33)	1.5 ± 1.4	0.43 ± 1.13	p=0.05

TABLE 2: Summary of QoL Endpoints at Baseline and 6 months after STN-DBS

	Baseline	6-month follow-up	Statistical significance: Baseline vs. 6 months
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Total Score	13.9 ± 4.8	3.7 ± 3.9	p=0.01*
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Handwriting	2.76 ± 1.35	0.78 ± 0.97	p=0.04*
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Cutting	2.53 ± 1.37	1.00 ± 1.32	p=0.06
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Dressing	2.47 ± 1.18	0.44 ± 0.73	p=0.01*
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Hygiene	2.59 ± 1.18	0.67 ± 0.87	p=0.01*
Lang-Fahn Activities of Daily Living Dyskinesia Scale – Walking	2.53 ± 1.18	0.78 ± 0.83	p=0.02*
EQ-5D – Total Score	9.59 ± 0.90	8.33 ± 1.73	p=0.16
EQ-5D – Mobility	1.95 ± 0.23	2.00 ± 0.50	p=1.00
EQ-5D – Self-care	1.8 ± 0.4	1.33 ± 0.50	p=0.05†
EQ-5D – Usual activities	2.00 ± 0.033	1.67 ± 0.50	p=0.08
EQ-5D – Pain	2.05 ± 0.52	1.89 ± 0.60	p=0.56
EQ-5D – Anxiety/depression	1.74 ± 0.56	1.44 ± 0.53	p=0.93
Geriatric Depression Scale – Total Score	5.67 ± 3.46	4.89 ± 3.06	p=0.50
Geriatric Depression Scale – Question #6 (impending doom)	±	±	p=0.03
Geriatric Depression Scale – Question #9 (prefer to stay home)	±	±	p=0.05
Mini-Mental Status Exam	28.7 ± 1.53	28.9 ± 1.90	p=0.48

*paired t-test

† Wilcoxon signed-rank test

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