Health Related Quality of Life in Essential Tremor Patients Undergoing Deep Brain Stimulation

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OBJECTIVE

To determine the effect of ventral intermedius (VIM) deep brain stimulation (DBS) on health-related quality of life (HRQoL) in essential tremor (ET) patients using disease-specific instruments.

BACKGROUND

Several studies have concluded that DBS improves motor function in medically-refractory ET patients; less emphasis has been placed on HRQoL measures. Generic HRQoL scales are multidimensional questionnaires that cover a wide variety of areas and can be applied to many diseases, but may lack sensitivity in areas important to ET, such as tremor or social embarrassment. .

METHODS

ET patients who underwent VIM-DBS were assessed prospectively using several clinical scales at baseline and 6 months after implantation: Tremor Rating Scale (TRS), Quality of Life in Essential Tremor Questionnaire (QUEST), Questions on Life Satisfaction Module (QLSm), Mini-Mental Status Examination (MMSE), and Geriatric Depression Scale (GDS).

RESULTS

At total of 7 patients (4 male), age 67.9 ± 13.9 years, consented to be enrolled in this study. The TRS improved by 65.3% (p<0.001) from baseline to 6 months **(Table 1)**. Three portions of the QLSm improved significantly including QoL in relationship to leisure activities/hobbies, controllability/fluidity of movement, and hand dexterity **(Table 2 & 3)**. The total QUEST score improved from 39.3 ± 6.2 to 13.0 ± 6.4 (p=0.004). On average, patients were "moderately to very satisfied" with several variables related to the neurostimulator: reliability, inconspicuousness, manipulation, and absence of false bodily sensations. Depression improved significantly while MMSE scores did not changed appreciably.

TABLE 1: Summary of Clinical Endpoints at Baseline and 6 months after VIM-DBS

	Baseline	6-month follow-up	Statistical significance: Baseline vs. 6 months
Tremor Rating Scale	61.4 ± 3.3	21.3 ± 3.6	**P<0.001**
Geriatric Depression Scale	3.6 ± 1.7	2.1 ± 1.7	**p=0.04**
Mini-Mental Status Exam	29.5 ± 0.3	29.3 ± 0.5	p=0.61

CONCLUSIONS

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

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

	Baseline	6-month follow-up	Statistical significance: Baseline vs. 6 months
General Section: How important/satisfied are you with the following:			
Friends/acquaintances	13.3 ± 0.9	14.3 ± 1.7	p=0.52
leisure activities/hobbies	4.1 ± 4.2	11.1 ± 3.2	**p=0.05**
health	8.0 ± 2.5	10.4 ± 2.0	p=0.51
income/financial security	8.6 ± 2.1	11.0 ± 2.6	p=0.37
occupation/work	0.6 ± 3.6	4.6 ± 2.7	p=0.36
living conditions	13.9 ± 3.1	15.1 ± 1.5	p=0.70
family life/children	17.4 ± 1.3	18.1 ± 1.2	p=0.69
relationship with your partner/sex life	6.1 ± 5.2	10.1 ± 3.9	p=0.40
Health Section: How important/satisfied are you with the following:			
physical condition	4.4 ± 3.0	7.1 ± 2.3	p=0.50
ability to relax/inner peace	8.6 ± 4.2	10.9 ± 2.9	p=0.43
energy level/enjoyment of life	7.3 ± 3.9	6.0 ± 2.7	p=0.72
ability to get around (for example, walking, driving)	12.6 ± 3.4	13.6 ± 2.1	p=0.83
ability to see and hear	17.4 ± 1.3	17.7 ± 1.5	p=0.89
being free from anxiety	10.3 ± 4.1	14.6 ± 2.6	p=0.26
being free from discomfort and pain	8.1 ± 4.6	12.0 ± 3.5	p=0.42
not needing help/care	12.0 ± 2.0	12.0 ± 3.5	p=1.00

TABLE 3: Summary of QoL Endpoints at Baseline and 6 months after VIM-DBS

	Baseline	6-month follow-up	Statistical significance: Baseline vs. 6 months
DBS Section: How important/satisfied are you with the following:			
controllability/fluidity of movement	-5.1 ± 4.2	13.3 ± 2.6	**p=0.02**
absence of dizziness/steadiness when standing and walking	7.4 ± 3.5	13.0 ± 3.3	p=0.28
hand dexterity throughout the day (e.g. when eating and writing.	-7.7 ± 2.8	13.9 ± 2.4	**p=0.01**
articulation/fluency of speech	14.3 ± 1.7	9.4 ± 3.5	p=0.14
ability to swallow	16.3 ± 1.5	10.0 ± 4.1	p=0.14
absence of false bodily sensations	8.7 ± 4.0	12.3 ± 1.9	p=0.37
bladder/intestinal function	10.4 ± 4.1	10.7 ± 3.4	p=0.90
sexual excitability	5.6 ± 3.8	3.7 ± 4.5	p=0.46
undisturbed sleep	6.4 ± 4.2	9.7 ± 4.2	p=0.44
memory/clear thinking	12.3 ± 1.4	14.1 ± 3.0	p=0.53
independence from help (e.g. when dressing and getting washed)	15.0 ± 1.9	15.6 ± 1.3	p=0.67
inconspicuousness of illness	5.2 ± 5.6	9.5 ± 3.0	p=0.63
Health Section: How satisfied are you with the following:			
reliability of the neurostimulator	NA	±	NA
inconspicuousness of the neurostimulator (casing, cable, scars)	NA	±	NA
independent handling/manipulation of the neurostimulator	NA	±	NA
doctoral care (quality, availability)	NA	±	NA
absence of bodily symptoms / side effects of the neurostimulation	NA	±	NA

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