

Post DBS – 12 Month Follow-up with Syndopa and Supervised Patient Centric Physiotherapy

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Abstract

An increasing prevalence of Parkinson's disease are widely recorded globally specific physiotherapeutic management of post DBS are less researched.

Aims & Objectives: of this original 12 month follow up was to evaluate problem based exercises post DBS on QOL.

Materials & Methodology: 54 Year old man with PD since 2011, with progressive dyskinesia was treated with DBS in 03.10.2018, in Chennai, post operatively his problems were evaluated based on which specific supervised physiotherapy techniques with a frequency of twice a week for 25-30 minutes each session from 03.10.2018 till 30th September 2019

Results: Pre and post QOL using UPDRS were evaluated, analyzed statistically $P < .05$ along with clinical prognosis were discussed with evidence

Conclusion: Patient centric exercises were more effective than following a specific technique or protocols among neurological subjects, but techniques further validation.

Introduction

PD (Parkinson's Disease) is one of the most disability neurologic disease and leads to a significant loss of quality of life (Scharg et al 2015)

Motor symptoms in P.D from the early stages of the disease affect balance and mobility despite optimal medical approaches (Doherty et al 2011)

Physiotherapy approaches including exercise programs have been shown to effectively reduce functional deficits (Goodwin et al 2008) and improve independence and quality of life (Tomilson et al 2014)

Perlmutter et al 2006 have recorded that DBS (Deep Brain Stimulation) to have provided remarkable benefits for people with a variety of neurologic conditions including P.D

Keywords: PD - Parkinson's Disease, STN - Sub Thalamic Muscles, DBS - Deep Brain Stimulation, QOL – Quality of Life, UPDRS - Unified Parkinson's disease rating scale

Background Information

55 year old male gives H/O

Type II diabetes since 2013, with hba_{1c} at 7.6%, dyskinesia, dysarthric, shuffling gait and on Syndopa since 2011, left hander, a chartered accountant, non alcoholic has underwent DBS of both STN (Sub Thalamic Muscles) on October 2018 in Chennai is treated by the author since on October 2018 till September 2019, his clinical prognosis and specific physiotherapy means were discussed below with evidence in this original research presentation

Materials & Methodology

This research was conducted on a Parkinson's patient (Since 2011) having undergone Deep brain stimulation in 2018 with specific physiotherapeutic means from on

October 2018 till September 2019 in Chennai. He was treated with weekly twice frequency for 25-30 minutes of each session at an intensity between 50-70% of his maximal heart rate.

Major Problems Identified

Inadequate hip, knee flexion, ground clearance while walking

Posture: Mild thoracic kyphosis

Gait: Ambulant unaided but requires monitoring while walking on uneven surfaces

ROM: Cervical spine and right shoulder movements were painful and restricted

ADL: Partially independent for most of his daily activities

Procedure

- Postures such as sitting on a physioball, lying (Supine, Side Prone) standing were used
- Core strengthening and Proprioceptive exercises were widely adopted
- Left hander, having inflicted with right hemiparesis rehabilitation with exercises needs more planning
- Developed Capsulitis of right shoulder and was treated with posterior anterior glide and strengthening exercises to right shoulder and scapula muscles
- Balance in standing and walking was poor with moderate tendency to have falls pre DBS (Post DBS 3 falls were recorded) due to lack of ground clearance

Results and Clinical Prognosis

Table 1: results on cadence

| | Cadence | UPDRS | SD | SE | t | P | Cohn Jahr Staging | Waist Circumference Cm |
|-------------|------------|-------|------|------|------|------|-------------------|------------------------|
| Pre | 500 | 24 | 5.07 | 4.09 | 4.09 | <.05 | 1.5 | 103 (Decreased 8%) |
| Post | 5000 / Day | 12 | | | | | 1.5 | 92 |

Table: 2: Clinical Prognosis

| His physical conditions as on October 2018 | | As on September 2019 |
|--|---|--|
| 1. Transfer Activities | Partially dependant | Adequately independent but requires monitoring |
| 2. Balance | In Standing: Moderate in unilateral stance | Good Balance in standing for unilateral stance |
| 3. Motor Control | Moderate in Daily Activities of right elbow, shoulder hip, knee | Has improved substantially |
| 4. Moderate Rigidity | Of right arm, leg were noted | Slight reduction was recorded |
| 5. Romberg Sign | was positive | Remains Positive |
| 6. Deep tendon side Reflex's of Right | Exaggerated | Mild Reduction |
| 7. Walking | Was Walking only for daily needs | Motivated for daily walking for 5000 steps daily |
| 8. Social Activities | Restricted social activities | Has started playing carom board, tennis and attending social meetings |
| 9. Posture | Thoracic kyphosis | Adequate improvement in posture |
| 10. ROM | Of shoulder, cervical spine restricted | Of shoulder, cervical spine has been restored adequately but extreme ranges still mild painful |
| 11. Falls | 3 falls were recorded prior to DBS | No incidence were reported for falls post DBS |

Discussion

Physiotherapy Post DBS with Evidence

- Benabid et al 2003 have recorded that acute and long term results after DBS shows a dramatic and stable improvement of a patients clinical condition, which mimics the effects the levodopa treatment. The mechanism of action involve a functional disruption of the abnormal neural messages associated with Duncan et al 2010 in a 8 week where post in DBS were allotted in two groups with weekly twice physiotherapy of balance and gait. STN – DBS effectively reduces tremor, rigidity and bradykinesia in P.D (Chou et al 2013) with annual number of STM DBS between 8000 to 10000(2 Ponce and Lozano 2010)
- Post operatively respiratory exercises postural alignment exercises are effective in increasing respiratory capacity (Dixon et al 2009)

- Facial, lingual, oral respiratory exercises to ensure speech correctness (Morris et al 2000)
- One year follow up post DBS where the subject was treated with Proprioceptive, core strengthening exercises along with his shoulder Capsulitis and balance training has shown a good clinical prognosis as stated earlier and a reduction of obesity by 8% as shown in table 1 of results

QOL post DBS with physiotherapy

- 19 subjects from 37-72 years who have undergone DBS, in 6 months balance and gait has improved with physiotherapy (Atlu et al 2014). Denshi et al 2006 among 156 patients with advanced PD and severe motor symptoms have established neuro stimulation of the sub thalamic nucleus to be more effective than the medical management alone in a six months study
- ADL and QOL motor symptoms with physiotherapy post DBS have improved (Atlu et al 2012)
- An improved ADL, QOL were recorded in this study subject in line with above researches

Falls in P.D and Post DBS

- Also falls may increase (Weaver et al 2009) 42% of subjects reported worsened gait (Van Neunen et al 2008), deficit in balance and gait may lead to falls, fall related complication and physical inactivity in people with P.D leading and increased mortality and a reduced QOL (Bloem et al 2004), this study subject who has frequent falls prior to DBS, but this one year post DBS no falls were recorded.

Negative prognosis with DBS

- Postural stability initially improves but worsens in individuals 6 months post DBS and also did not improve balance (Rochii et al 2004)
- However this research subject has substantially shown a positive prognosis contrary to (Rochii et al 2004)

Critical Analysis of this Research

1. Motor symptoms (Right Hemiparesis) and subsequent Capsulitis of right shoulder were treated but less analyzed in discussion.
2. The efficacy of core strengthening and Proprioceptive exercises post DBS lacks evidence
3. Reduction in obesity among subjects with movement disorders and their influence on QOL were not analyzed

Conclusion

As with lack of specific guidelines with evidence to treat advance neurological surgeries, this research outcome can further be continued with larger sample size and RCTS

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