



Deep Brain Stimulation of the Subthalamic Nucleus and the Postoperative Levodopa Response?

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Dear Editor,

The article by Kocabicak et al. reporting on the decreased levodopa responsiveness in the first year follow-up of PD subjects undergoing STN-DBS provides strictly crucial results that need to be examined carefully (1). The researchers hypothesized that the reduced postoperative levodopa responsiveness in STN-DBS patients might be the result of several factors, including a decrease in receptor sensitivity, decreased drug doses and more direct effects of STN-DBS. We would like to discuss two theories to explain the decreased L-dopa responsiveness in this study. One theory, also mentioned by Kocabicak et al. (1), indicates that STN stimulation may act to increase dopamine release in the SNr, reducing the need for supplementation with levodopa. According to this hypothesis, the difference between the preoperative and postoperative first year UPDRS III scores in the medication on periods was subtle (20.7–19.7), whereas it was obvious between the postoperative first year UPDRS III scores in the STIM off med off and STIM on med on periods. To clarify this hypothesis, we wonder if the authors may include data regarding the levodopa response rates in the postoperative first year during the STIM off periods. A possible decrease in the response to levodopa in the STIM off period might provide crucial contributions regarding the mechanisms of DBS, such as neuroprotection and neurogenesis, which are hypothesized to occur in the chronic term after DBS (2). Investigating the levodopa responses in future studies, systematically in the changing phases after DBS surgery, may provide critical perspectives regarding the mechanisms underlying DBS efficiency. Another explanation may be that the decrease in levodopa responsiveness may be related to the reduced medication doses as well as the trial levodopa dose in the postoperative first year. To respond to this discussion, an evaluation of medication on UPDRS III scores in the postoperative first year period should be conducted after prescribing the same dose of levodopa used in the presurgical term.

In conclusion, the results of this study (1) are particularly significant and give rise to critical new efforts that would address the unknown aspects of the mechanisms of DBS efficiency. Future prospective studies, including follow-up DaTSCAN investigations, may also make crucial contributions in this regard.

Abbreviations

PD: Parkinson's disease, **STN-DBS:** Subthalamic nucleus deep brain stimulation, **SNr:** Substantia nigra pars reticulata, **UPDRS:** Unified Parkinson's Disease Rating Scale, **STIM:** stimulation. **DaTSCAN:** dopamine transporter scan

AUTHORSHIP CONTRIBUTION

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Data collection: HO

Analysis and interpretation of results: HO, SC

Draft manuscript preparation: HO

Critical revision of the article: HO, SC

Other (study supervision, fundings, materials, etc...): HO, SC

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