



To do or don't, to take or don't take: STN-DBS therapy in young PD patient

Učiniti ili ne, primeniti ili ne primeniti: STN-DBS terapija kod mlađe osobe sa Parkinsonovom bolešću

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Abstract

Introduction. Parkinson's disease patients with impulse control disorders and dopamine dysregulation syndrome is increasingly recognized. There are reports that such disorders can sometimes be improved by using deep brain stimulation, but sometimes they can get worse. **Case report.** Our patient was a 30-year-old man with Parkinson's disease since the age of 23. The patient had motor fluctuations on the right with marked bradykinesia, bradymimia and rigidities in the off-periods. The patient's paraphilia and sexual indiscretions against women were apparent in the on-periods. The patient's eating habits were also changed. The patient underwent subthalamic nucleus-deep brain stimulation (STN-DBS). Significant improvements were seen in the motor and behavior signs of the patient after this procedure had been performed. **Conclusion.** STN-DBS may be a reasonable option in patients with Parkinson's disease when unwanted dopaminergic side effects occur, and motor disorders and impulse control disorders cannot be improved with drugs.

Key words:

parkinson disease; young adult; subthalamic nucleus; deep brain stimulation; treatment outcome.

Apstrakt

Uvod. Oboleli od Parkinsonove bolesti sa poremećajima kontrole impulsa i sindromom dopaminske disregulacije sve se više prepoznaju. Objavljeno je da se primenom duboke stimulacije mozga ovo stanje može ponekad rešiti, ali i pogoršati. **Prikaz bolesnika.** Naš bolesnik je bio 30-godišnji muškarac sa Parkinsonovom bolesti koja je dijagnostikovana u njegovoj 23. godini života. Bolesnik je imao motoričke fluktuacije s desne strane sa izraženom bradikinezijom, bradimijom i rigiditetom u „off“ periodima. Njegova parafilija i seksualna indiskrecija prema ženama je bila izražena u „on“ periodima. Prehrambene navike bolesnika bile su takođe izmenjene. Bolesnik je bio podvrgnut dubokoj moždanoj stimulaciji suptalamičkog jedra (engl. *subthalamic nucleus-deep brain stimulation* – STN-DBS). Nakon sprovedene procedure, značajna poboljšanja bila su uočena u motorici i ponašanju bolesnika. **Zaključak.** STN-DBS može biti razumna opcija kada se kod obolelih od Parkinsonove bolesti pojave neželjeni dopaminergički efekti, a motorički poremećaji i poremećaji kontrole impulse ne mogu poboljšati primenom lekova.

Ključne reči:

parkinsonova bolest; mlade osobe; suptalamičko jedro; duboka stimulacija mozga; lečenje, ishod.

Introduction

Parkinson's disease (PD) patients with impulse control disorders (ICD) and dopamine dysregulation syndrome (DDS) is increasingly recognized. DDS occurs due to anti-parkinson therapy, and may include other psychomotor pathologies known as ICD: punding, pathological gambling, hypersexuality, binge eating and compulsive shopping. Such disorders may have dramatic effects on patient's family, and his/her personal and professional life. Drug replacement

therapy (DRT) is believed to play an important role in the onset of these behavioral disorders^{1,2}.

Binge eating phenomenon among PD patients has been defined by a few authors. A reliable prevalence of this disorder has not been reported. Binge eating implies continuous compulsive food intake. It is an increased diet in the form of uncontrollable consumption of more than normal food and a large amount to alleviate hunger. Zahodne et al.³ reported that 1% of PD patients have binge eating disorder (BED).

ICD and DDS relationship with subthalamic nucleus (STN) in PD is not exactly known. It has been reported that such disorders can sometimes be improved by using STN deep brain stimulation (STN-DBS), but sometimes they can get worse after this procedure. We report young PD patient who had improved DDS and ICD after STN-DBS application.

Case report

Our patient was a 30-year-old man with PD since the age of 23. The patient recently complained of decreased motion, early termination and late onset of drug effect, difficulty in turning at night, extreme mobility and involuntary movements, especially after taking medication. The patient had motor fluctuations on the right with marked bradykinesia, bradymimia and rigidities in the off-periods. The patient's paraphilia and sexual indiscretions against women were apparent in on-periods. The patient's eating habits were also changed. His movements became faster and he took the food in excess. At that time, even when nothing was manifest, he was clumsy. He put everything he could find in his mouth; even he experienced the danger of drowning

Whenever he needed levodopa, eating disorder could be seen. Sometimes the patient did not wait for the time to expire; sometimes he was taking the extra levodopa. He said he got that pleasure. Even their relatives had to hide the medication.

The patient received orally 418.75 mg/day of levodopa/benserazide, 250 mg/day of levodopa/carbidopa/entacapone, 1 mg/day of rasagiline, 200 mg/day of amantadine, and intermittently 5 mg s.c. of apomorphine. The patient was Unified Parkinson's Disease Rating Scale (UPDRS) part I–1, UPDRS part II – Off 20, UPDRS part III – Off 24 and Hoehn&Yahr stage –Off 4. The dopamine agonists were removed from the treatment. Clozapine and quetiapine treatment, given by the psychiatrist, was discontinued due to worsening motor symptoms.

Despite this treatment, the patient could not sustain his life independently. He met the STN-DBS inclusion criteria as an idiopathic PD. Psychiatric statement was considered a contraindication for this procedure and before it the patient was re-evaluated. He was no psychiatric disease before the illness. There was no history of a similar disease in his family. We were concluded that behavioral problems may be related to dopaminergic therapy. The patient was diagnosed with ICD due to dopamine dysregulation syndrome. We decided that DBS administration and reduction of dopaminergic therapy would contribute to the improvement of motor disorders and DDS.

The patient underwent STN-DBS. Significant improvement was seen in the motor signs of the patient after the procedure performed. The patient's off-periods were reduced, and the patient was able to survive without assistance. In the second year after STN-DBS, levodopa was completely withdrawn from the therapy. After that, the patient used ra-

sagiline 1 mg/day, and amantadine 200 mg/day *per os*. Significant improvement in DDS, ICD and BED symptoms was observed during the follow-up period of 3 years.

Discussion

We reported here a young PD patient who developed ICD and DDS, such as sexual and eating disorders, after dopaminergic therapy. Significant resolution in psychiatric findings and motor symptoms improvement of our patient were seen after STN-DBS administration and dopaminergic treatment reduction. Our opinion is that STN-DBS administration in the PD patient with DDS and ICD, associated with dopaminergic therapy, may be important in disease management.

ICD, which occurs in a minority of patients with advanced PD, is rare, despite a rather regrettable psychiatric complication. It is estimated that ICD prevalence may be greater in PD patients than in the general population or healthy controls, and patients may have more than one ICD. ICD prevalence in PD was estimated to be 1.7–6% for pathological gambling, 2–10% for hypersexuality, 0.4–5.7% for compulsive shopping, 4.3% for binge eating and 3.9% for two or more ICD. ICD is a condition that leads to morbidity as a result of long-term dopaminergic therapy in PD patients¹.

Reward-seeking behaviors, including consumption of delicious food, are supported by the activation of the mesocorticolimbic dopamine neurocircuitry. The disorder of the mesocorticolimbic system forms the basis of binge eating – excessive consumption of delicious food behavior⁴. Dopamine overdose may increase nutrient motivation in PD patients treated with dopamine agonists leading to disturbed nutritional behavior such as an increased food intake, i.e. excessive eating. Dopamine replacement therapy and, in particular, D2/D3 selective dopamine agonists may cause behavioral changes, ICD and BED⁵.

The effect of STN-DBS therapy in significant impulsive behaviors patients is largely unknown. ICD symptoms can be improved with the reduction of post-STN-DBS dopaminergic therapy, as well as the anew these symptoms may have emerged or in some cases may worsen pre-existing ICDs^{6,7}.

Conclusion

This report revealed the problem of how to treat ICD with PD. ICD and related behavior disorders such as BED and DDS may result in serious trouble to PD patients and their caregivers. STN-DBS may be a reasonable option when unwanted dopaminergic side effects occur and motor disorders cannot be improved with drugs including neuroleptics. Our case suggests that a background of drug-induced psychiatric disorders with motor function worsening does not constitute an obstacle to the STN-DBS application.

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