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Othello syndrome after STN DBS – psychiatric side-effects of DBS and methods of dealing with them

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Summary

Aim. Deep brain stimulation is a therapeutic method used for decades in neurological diseases such as Parkinson's disease or dystonia. Despite many publications concerning DBS, there are few publications on psychotic symptoms after DBS, there are also no standards of dealing with them.

Material and method. The authors present a case of a patient with Parkinson's disease, in whom psychotic symptoms in the form of Othello-like syndrome appeared after implantation of a stimulator. In this case the strategy of continuation of stimulation and adding antipsychotic drug (quetiapine) was chosen.

Results. Gradual resolution of psychotic symptoms, without worsening of neurological symptoms and no recurrence of psychiatric symptoms was observed.

Conclusions. In recent years, work is underway on the use of DBS in psychiatry, particularly in patients with treatment-resistant depression. It is necessary to set the strategy for dealing with side-effects of DBS. Most of the authors prefer the temporary or permanent switch off the stimulator. In the author's opinion, in some cases it is possible to effectively treat the psychotic symptoms without resignation from the benefits of stimulation. So far, however, such cases were described so rarely that it is difficult on this basis to formulate conclusions that can be applied to the whole population of patients treated with DBS. Only a systematic study including an assessment of psychotic symptoms using scales and analysing the received treatment and stimulation parameters could give an idea of what is the most appropriate strategy in case of psychosis following DBS.

Key words: psychosis, deep brain stimulation, antipsychotic drugs

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Deep brain stimulation (DBS) is a therapeutic method used for decades in neurological diseases such as Parkinson's disease (PD) or dystonia. Despite many publications concerning DBS, still there are few publications concerning psychotic symptoms as a complication of stimulation, there is also a lack of standards of dealing with psychiatric side-effects.

The article is a case report presentation of a patient who presented delusions of marital infidelity resembling Othello syndrome. The authors also discuss management strategy followed in this case.

35-year old patient for 7 years suffering from Parkinson's disease (stage III/IV in Hoehn-Yahr scale) was treated with subthalamic nucleus stimulation. The patient was qualified for surgery in accordance with the CAPSIT-PD (Core Assessment Program for Surgical Interventional Therapies in PD) guidelines. According to the protocol of the study "Evaluation of the prevalence of mood disorders in patients with Parkinson's disease after subthalamic nucleus stimulator implantation" a psychiatric examination and a comprehensive assessment of mental status with the use of psychometric scales: assessment of depressive symptoms (Beck Depression Rating Scale, Hamilton Depression Rating Scale, Montgomery-Asberg Depression Scale), assessment of overall mental status (CGI, PGI) and test for the presence of psychotic symptoms (BPRS scale, PANSS) was made 24 hours prior to surgery. The choice of psychometric tools in this case was dictated by the methodology of the study, attended by the discussed patient. The study was approved by the Bioethics Committee of the Institute of Psychiatry and Neurology. Evaluation of mental state was repeated 24 hours after surgery. Both mental state examination conducted before surgery and the day after, did not reveal the presence of the patient's psychotic symptoms (BPRS 18 points, 32 points in PANSS). Examination of mental state was performed one month after the first surgery, after 30 days of implantation, 6 hours after initiation of bilateral stimulation (stimulation ON) and after a further 30 days after the initiation of stimulation, at constant stimulation parameters. None of the evaluations revealed the presence of psychiatric disorders. Scoring in the BPRS and PANSS scales assessing psychotic symptoms remained unchanged and was normal (18 points on the BPRS, 32 points on PANSS). After a period of approx. 4 months after pacemaker implantation and 3 months from the start of bilateral stimulation the patient's family noticed irritability, suspicion and aggressive behaviour. In a short time delusions and delusions of marital infidelity and delusions of reference appeared. At the time of psychiatric evaluation patient presented psychotic symptoms in the form of delusions and behavioural disorders, dysphoria, and disorders of circadian rhythms (47 points on the BPRS, 87 points on PANSS). The patient was diagnosed with organic delusional disorder (F06.2 according to ICD-10). The patient did not consent to the proposed psychiatric hospitalisation to determine treatment, there were also no indications for hospitalisation against the will and it was therefore decided to continue treatment on an outpatient basis. In view of the significant improvement

in neurological state reflecting in UPDRS assessment, reduced bradykinesia, rigidity and tremor, it was decided to continue stimulation accompanied by antipsychotic treatment. Patient was treated psychiatrically with quetiapine in the dose titrated from 25 to 100 mg daily. The choice of quetiapine was dictated by a broad spectrum of action of this drug (sedative, mild mood stabilizer, antipsychotic at higher doses) and a small effect on parkinsonian symptoms. Despite the dose lower than the standard antipsychotic dose, gradual resolution of psychotic symptoms, without worsening neurological symptoms was observed (after 5 months of stimulator implantation – 30 points on the BPRS, 42 points on PANSS). After 12 months of implantation patient's mental status was balanced, the significant improvement of the symptoms of Parkinson's disease was observed (assessment 1 year after implantation in 21 points on the BPRS, 36 points on PANSS).

In case of resolution of psychotic symptoms, the spontaneous remission of symptoms can never be completely ruled out. This applies both to this case report and all cases of endogenous psychoses, but coincidence in time between the resolution of symptoms and the administration of antipsychotic medication seems to indicate that in this case the pharmacotherapy was responsible for the improvement in mental state.

Similar cases of psychotic symptoms associated with deep brain stimulation have already been described in the literature, mainly as case reports. However, there is little information on the applied treatment, in these cases the improvement was achieved during the treatment with aripiprazole in a dose of 10 mg/d [1], olanzapine at a dose of 15 mg/d [2], or, similarly to this case – quetiapine [2] at a dose of 150 mg/d. Usually during antipsychotic treatment (as in this case) the minor modifications of stimulation parameters are made, and it is difficult to separate the effects of increasing doses of neuroleptic from the effects of the parameter changes [1, 2]. Appleby et al. [3] recently published meta-analysis, which included 808 studies on effectiveness of DBS in different disease entities. 98.2% of respondents reported an improvement in motor function. The analysis of a group of 6,573 patients treated with DBS shoved that psychotic symptoms were observed in 40 patients, the risk of psychotic side-effects was estimated to be 0.6–1.2%.

It should be noted that guidelines for treatment of post-implantation side-effects such as mood disorders or psychotic decompensation has not yet been developed. Zyss et al. [4, 5] rightly point out that in case of mental disorders after starting the stimulation the best strategy would be to turn off the stimulator and after symptoms have resolved to attempt a re-start to verify the causal link between the DBS and the symptoms. Some researchers indicate that in the case of obvious advantages in terms of neurological symptoms improvement it should be considered to continue stimulation and add symptomatic treatment (e.g. antidepressants, antipsychotics, anxiolytics). However, there are no studies and descriptions that would allow evaluating the effectiveness of such proceedings [1]. Other authors suggest stimulation parameters

change [2]. Due to the small percentage of this type of complications in patients treated with neurological disorders and a very small number of patients treated with DBS due to psychiatric reasons it is difficult to evaluate the risk of psychiatric side effects associated with this method.

It should be noted that in a population of patients undergoing qualification procedure for DBS implantation the incidence of depression, anxiety and psychotic symptoms was higher than in the general population of patients with PD (depressive symptoms were observed in 60% of patients, psychotic symptoms in 35%, anxiety in 40%) [6]. This confirm the thesis that the risk of mental disorders increases with the severity of the disease and patients with the most severe symptoms of PD are also the group most predisposed to psychiatric symptoms. This also shows how important it is to conduct a complex neuropsychological and psychiatric examination both to qualify for the surgery, as well as in the period following it. It seems that in order to systematically assess the mental state, the psychiatric examination should be accompanied by the use of diagnostic questionnaires (SIDI-I, MINI, CIDI), and then further evaluated with the use of proper tools. It would allow to create a standard of care and diagnosis of patients eligible for DBS and to obtain a comparable data from different centres.

In recent years, work is underway on the use of DBS in neurology and psychiatry. For this reason, it is necessary to set the guidelines for dealing with side-effects of DBS. Most of the authors prefer the temporary or permanent switch off the stimulator. In the author's opinion, in some cases it is possible to effectively treat the psychotic symptoms without resignation from the benefits of stimulation. So far, however, such cases were described so rarely that it is difficult to formulate conclusions that can be applied to the whole population of patients treated with DBS on this basis. Only a systematic study including an assessment of psychotic symptoms using scales and analyzing the received treatment and stimulation parameters could give an idea of what is the most appropriate strategy in case of psychosis following DBS.

References

1. Raucher-chene D, Charrel C-L, Doe de Maindreville, Limosin F. *Manic episode with psychotic symptoms in a patient with Parkinson's disease treated by subthalamic nucleus stimulation: Improvement on switching the target*. J. Neurol. Sci. 2008; 273: 116–117.
2. Widge A, Agrawal P, Giroux M, Farris S, Kimmel RJ, Hebb AO. *Psychosis from subthalamic nucleus deep brain stimulator lesion effect*. Surg. Neurol. Int. 2013; 4: 7.
3. Appleby BS, Duggan PS, Regenberg A, Rabins PV. *Psychiatric and neuropsychiatric adverse events associated with deep brain stimulation: a meta-analysis of ten years' experience*. Mov. Disord. 2007; 12: 1722–1728.
4. Zyss T, Zięba A, Hese RT. *Głęboka stymulacja mózgu najnowszą fizykalną metodą leczenia depresji*. Psychiatr. Pol. 2010; 44(3): 301–317.

5. Zyss T. *Nowe techniki stymulacji elektrycznej i magnetycznej. Porównanie z elektrowstrząsami i farmakoterapią*. Psychiatr. Pol. 2010; 44(6): 853–869.
6. Voon V, Saint-Cyr J, Lozano AM. *Psychiatric symptoms in patients with Parkinson disease presenting for deep brain stimulation surgery*. J. Neurosurg. 2005; 103(2): 246–251.

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