

Deep Brain Stimulation in Parkinson's disease – Patient Selection and Initial Experience in Varna, Bulgaria

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Introduction: Parkinson's disease (PD) patients with motor complications such as motor fluctuations and dyskinesia or refractory tremor can be treated with deep brain stimulation (DBS). An optimal patient selection process is crucial for the post-surgical therapeutic success.

Aims: To present our preoperative evaluation protocol, inclusion and exclusion criteria for DBS treatment and early postoperative results in PD patients in the University Hospital "St. Marina", Varna, Bulgaria.

Methods: Patients with late-stage PD were assessed by a multidisciplinary team including neurologist, neurosurgeon, psychiatrist and a clinical psychologist. All DBS candidates were screened with a local evaluation protocol, consisting of neurological assessment, clinical investigations – blood samples, electromyography, magnetic resonance imaging (MRI), and a set of rating scales for evaluation of severity of PD, cognitive and neuropsychiatric tests and quality of life assessment.

Results: A total of 23 Parkinson's disease patients were referred to the DBS center in the University Hospital "St. Marina", Varna, since December 2018. After the preoperative evaluation 12 patients were assessed as good candidates and in 6 of them (5 male and 1 female) received bilateral STN-DBS systems. The patients who underwent DBS surgery were at age of 61.2 ± 6.0 with duration of the Parkinson's disease of 11.0 ± 3.9 years, whereas the first symptoms started before 12.5 ± 3.4 years. During levodopa challenge at the preoperative evaluation the mean motor UPDRS score was 36.5 ± 8.6 in "off"-period, and 18.2 ± 7.6 in "on"-period, representing an improvement of 50.1% in best medical treatment ($p < 0.001$). After bilateral STN-DBS implantation there was notable improvement of the motor UPDRS score - 16.5 ± 8.0 ($p < 0.001$). A significant reduction in the daily levodopa dosage was also observed ($p = 0.003$).

Conclusion: Patient selection is a complex process and the most important step towards optimal results in DBS, accomplished by a multidisciplinary team. The implementation of a comprehensive candidate screening protocol is time consuming, but could significantly increase patient benefits and reduce the potential risks of adverse events.