DEEP BRAIN STIMULATION FOR THE TREATMENT OF PARKINSON'S DISEASE

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The introduction of deep brain stimulation for the treatment of movement disorders, first essential tremor and advanced Parkinson's disease, but recently also primary dystonia (Kupsch et al., 2006, NEJM), has opened new therapeutic avenues for hitherto untreatable diseases. Thus, brain regions, deeply located in the brain, may be functionally influenced by the reversible application of electrical charge via stereotactically implanted electrodes (deep brain stimulation) without structurally lesioning brain tissue. In Parkinson's disease (PD) deep brain stimulation (DBS) of the subthalamic nucleus has been shown to alleviate levo-dopa related complications such as dyskinesias and on-off fluctuations, which is accompanied by a reduction of dopaminergic medication. Furthermore, in advanced PD, DBS of the subthalamic nucleus leads to significantly greater improvements of quality of life in comparison to matched medically treated PD-patients during an observation period of six months (Deuschl et al., NEJM, 2006). Importantly, a simple preoperative test, the so called levo-dopa-test, seems to predict the outcome of the surgical procedure, reflected by a strong positive correlation of improvements of postoperative Parkinsonian symptoms and the amelioration following preoperative L-DOPA intake (with the exception of tremor, which positively responds to STN-DBS independently of the preoperative L-DOPA response). Postoperative benefit seems to be stable for at least 5 years (Krack et al., NEJM, 2003). This is intriguing, since preclinical studies suggest that STN-DBS may be neuroprotective in animal models of PD. The talk tries to summarize the results and the perspectives of deep brain stimulation in PD and focuses on the issure of neuroprotection.