Five-year review of DBS Plus: A clinical trial platform for combining delivery of investigational therapeutics with deep brain stimulation surgery

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Abstracts will be considered for both poster and platform presentations

Movement disorders

Over the last five years, we have been evaluating the safety and feasibility of investigating a cell therapy delivered to the substantia nigra in participants (n=50) with Parkinson's disease as part of Phase I open-label, single center, clinical trials (NCT01833364 and NCT02369003). Our novel approach combines surgical deployment of the investigational tissue with deep brain stimulation (DBS), which we have termed, DBS Plus. This strategy addresses several challenges of clinical trials focusing on disease modifying therapies for PD.

The source of our cell therapy material is autologous peripheral nerve tissue obtained from the sural nerve. Schwann cells are abundant in peripheral nerve tissue and transdifferentiate after injury into "repair cells". Tissue grafts are harvested and implanted into the substantia nigra, unilaterally or bilaterally, during DBS surgery directly following the placement of the stimulating electrodes.

Using an adaptive clinical trial design, we have used the DBS Plus platform to evaluate the safety and feasibility of deploying cell therapy to the SN at the time of DBS. We have progressed from evaluating single grafts placed during STN DBS (n=9), to single grafts placed during GPi DBS (n=17). Then, progressed to evaluating increased dosage unilaterally and bilaterally to the SN. In our experience, DBS Plus has an overall adverse event profile to that of DBS alone.

A major ethical advantage of DBS Plus is that participants do not have to forego the therapeutic benefits of DBS to be involved in the study. Additionally, trial costs are greatly reduced because the DBS surgery is not a part of the study and is covered by insurance. One challenge is that DBS Plus is better suited for disease modifying therapies as opposed to strategies aimed at symptomatic reduction. Overall, DBS Plus provides an excellent platform for exploratory, interventional, disease modifying clinical trials.