Evaluating the efficacy and tolerability of peripheral nerve stimulation as a potential therapy for Tourette syndrome

Professor Georgina Jackson, Professor of Cognitive Neuropsychology, University of Nottingham, UK
Award: £22,676
Study Duration: 2018 - ongoing

SUMMARY

The project evolved over a number of years following discussion with the Tourettes Action charity, individuals with Tourette syndrome (TS), and their families. When we ask people with TS to identify what they consider to be priorities for research, they stated that developing a safe and effective, non-drug, therapy for TS should be amongst our highest priorities. They also indicated that such therapies would ideally be suitable for administration in the home. This project, together with other funding to the University of Nottingham, moved us closer to achieving this goal by financing a number of studies of neural nerve stimulation. We demonstrated that during a short session of electrical stimulation of median nerve stimulation delivered to the wrist within a laboratory setting, both the urge to tics and tic severity were significantly reduced. We also demonstrated that the stimulation had no significant impact on attention or on voluntary movements. Following the publication of the results in 2020 https://www.cell.com/current-biology/pdf/S0960-9822(20)30558-3.pdf) we formed a university spin company (www.neupulse.co.uk) with the aim of develop a wrist based devise that could be used in the home.

A clinical trial of a home use prototype device was conducted in 2022 and the results of the trial were released online in May 2023. This demonstrated that home administration of median nerve stimulation every weekday (in a 14 minute periods) for 4 weeks resulted in a clinically meaningful reduction in tics (as assessed by total tic score-YGTSS-TTSS). Tic frequency (assessed by videos) demonstrated a significant reduction of tics during stimulation. Neupulse is now begin work to develop a device that can be brought to market as soon as possible. Since this is a clinical device it will need to complete regulatory approval before being available to the public.

Our long-term vision is to develop a small lightweight device that can be worn at the wrist (similar to a Fitbit) and that can be initiated by the individual. To this end we have set up a university spin out company and have conducted a clinical trial (March – September 2023) evaluating the home use of a prototype wearable.

Click here for links to publications:

Entraining Movement-Related Brain Oscillations to Suppress Tics in Tourette Syndrome - PubMed (nih.gov)

A double-blind, sham-controlled, trial of home-administered rhythmic 10-Hz median nerve stimulation for the reduction of tics, and suppression of the urge-to-tic, in individuals with Tourette syndrome and chronic tic disorder - PubMed (nih.gov)