Parameters of STN neuronal activity were not different among the two groups of patients neither the oscillatory activity. 

Conclusions: Although the number of patients included in this study should be increased results suggest that the R1441G mutation does not determine clinical severity or STN activity.

Key message: Characteristics of STN neurons in LRRK2–R1441G PD patients are similar to idiopathic PD.


ID 152 – Paired pulse TMS-EMG and TMS-EEG in epilepsy—A.A. de Goede a, M.J.A.M. van Putten a,b ( a Clinical Neurophysiology, University of Twente, Enschede, The Netherlands, b Clinical Neurophysiology, Medisch Spectrum Twente, Enschede, The Netherlands)

Objective: Epilepsy is characterized by an enduring predisposition to generate seizures, due to an increased cortical excitability (CE). Although the routine electroencephalogram (EEG) can assist in identifying increased CE, its sensitivity is low (30–55%). Therefore, we will investigate whether transcranial magnetic stimulation (TMS), another technique to measure CE, can be used to improve the diagnostic process in epilepsy.

Methods: Paired pulse TMS (ppTMS) is combined with electromyography (EMG) of the abductor pollicis brevis and 64-channel fullband EEG. Both motor hot spots are stimulated with 50 paired pulses (intensity 120% of resting motor threshold) at inter-stimulus intervals (ISIs): 50–300 ms, with 50 ms increments.

Results: ppTMS-EMG-EEG measurements on four healthy subjects are consistent with literature (Badawy et al. 2014; Premoli et al. 2014): ppTMS-EMG shows facilitation at ISI 50 ms and inhibition for ISIs 100–300 ms, while ppTMS-EEG (ISI 100 ms) shows inhibition below 70 ms and above 135 ms.

Conclusions: Based on pilot measures in healthy subjects, we will study first seizure patients to investigate differences in CE between patients diagnosed with epilepsy afterwards and those who are not. So far, ppTMS-EMG-EEG has never been applied in epilepsy.

Key message: ppTMS-EMG-EEG is a promising technique that may find application in the diagnostic process of epilepsy.


ID 178 – Longitudinal simultaneous DBS fMRI in the rodent brain—N. Van Den Berge a, C. Vanhove a, B. Descamps a, I. Dauwe b, P. van Mierlo a, R. Raedt b, K. Vonck b, P. Boon b, R. Van Holen a ( a Medical Image and Signal Processing Group, Ghent University-iMinds Medical IT department, Ghent, Belgium, b Laboratory for Clinical and Experimental Neurophysiology, Neurobiology and Neuropsychology, Ghent University Hospital, Ghent, Belgium)

Objective: The effects of Deep Brain Stimulation (DBS) have been studied primarily by electrophysiological and neurochemical studies, which lack the ability to elucidate DBS-related responses on a whole-brain scale. With this study our aim is to investigate DBS-induced global neuronal network activation in rats with functional Magnetic Resonance Imaging (fMRI).

Methods: Three times FMRI was done in seven rats, which were stereotactically implanted with a MR-compatible DBS-electrode in the right hippocampus. High frequency Poisson distributed stimulation was applied using a block-design paradigm. Response maps (p < 0.05) were obtained with Independent Component Analysis.

Results: Our data indicate that real-time hippocampal DBS evokes a uni- or bilateral BOLD response in hippocampal and mesolimbic structures, depending on the applied stimulation intensity. Results were reproducible in time and in-between subjects.

Conclusions: We present that DBS-fMRI can be used to detect whole-brain responses to circuit activation with different stimulation intensities, making this technique potentially powerful for exploring DBS-induced cerebral changes for preclinical and clinical DBS.

Key message: A better understanding of the whole-brain effect of DBS is necessary to improve treatment efficacy in patients. Successful translation of this research to patients might reduce the number of non-responders to this invasive and expensive treatment.