

14th World Summit on

Alzheimer's Disease, Dementia Care Research and Awareness

6th World Summit on **Heart, Stroke and Neurological Disorders**

August 31- September 01, 2018 | Boston, USA

Prefrontal tDCS in stroke patients with disorders of consciousness

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A small proportion of stroke survivors may face severe disability associated with an altered state of consciousness. Patients with disorders of consciousness (DOC) represent a challenging population to take care of, because of their inability to interact with their environment. Several therapeutic options have been investigated lately including non-invasive brain stimulation. Our group conducted three different randomized controlled trials investigating the effects of transcranial direct current stimulation (tDCS) applied for 20 minutes at 2 mA on the left dorsolateral prefrontal cortex (DLPFC) in patients with DOC. The main outcome measure was the Coma Recovery Scale Revised (CRS-R). The first trial focused on the effect of a single session, the second on 5 consecutive sessions and the third on 20 sessions. We retrospectively identified the patients for whom the etiology was an ischemic or hemorrhagic stroke. Eleven patients (out of 98) were identified (60 ± 13 years, 3 females, 5 VS/UWS and 6 MCS, 17 ± 30 months after stroke). At the group level, no significant treatment effect was identified in this subpopulation. At the single-subject level, four patients were identified as tDCS-responders meaning they showed a new sign of consciousness for the first time after the real stimulation. tDCS is a valuable treatment option for the patient in MCS when looking at the results of each trial (effects sizes of 0.38, 0.43 and 0.47, respectively). However, the effects of tDCS (and patient's tailored montage) in stroke patients with DOC need to be further investigate.

Biography

Geraldine Martens is a physiotherapist and a doctoral student in biomedical sciences in the Coma Science Group (University of Liège). She studied physiotherapy and rehabilitation at the University of Liège (2015), as well as doing a postgraduate year (specializing in neurosciences – 2016) allowing her to do her PhD. Since 2015, she has been studying potential treatments for patients in an altered state of consciousness. One aspect of this project relates to transcranial direct current stimulation (tDCS), which aims to improve signs of consciousness; the other aspect of this project relates to the study of spasticity in severely brain-damaged patients.

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