Title: TRANSCRANIAL MAGNETIC STIMULATION AND COGNITIVE REHABILITATION IN DEMENTIA: CURRENT EVIDENCE AND NEW APPROACHES

Name: Gianna C. Riccitelli

Neurocenter of Southern Switzerland, Department of Neurology, Neuropsychology and Behavioral Neurology Research Unit, Lugano, Switzerland.

Abstract

Today cognitive neurodegenerative diseases are a serious critical problem, with a prevalence that doubles every five years. Meanwhile, pharmacological therapies appear have no significant effect on disease course and cognitive training/rehabilitation interventions have generated temporary hope and mild proof of efficacy.

Transcranial Magnetic Stimulation (TMS), one of the most popular non-invasive brain stimulation technologies, uses electrical fields generated in the brain to enhance the activity of key brain regions contributing to relevant cognitive processes.

Nevertheless, the therapeutic benefit and clinical significance of TMS remain inconclusive, due to lack of a sufficient number of double-blind, placebo-controlled, randomized clinical trials demonstrating enduring effects and positive impact on prognosis.

The field remains promising but, to make further progress, research efforts need to take into account the latest evidence of the anatomical and neurophysiological features underlying cognitive deficits in these patient populations.

Moreover, as the development of *in vivo* biomarkers is ongoing, allowing for an early diagnosis of these neurocognitive conditions, one should consider a scenario in which TMS treatment will be personalized and made part of a cognitive rehabilitation program or used as a potential adjunct to drug therapies from the earliest stages of such diseases. Research should also integrate novel knowledge on the mechanisms and constraints promoting the impact of electrical and magnetic fields on cerebral tissues, and brain activity, and incorporate the principles of information-based neurostimulation.

The aim of this workshop is to present state of the art exploratory or therapeutic TMS investigations aiming at modulating cognitive impairments in dementia, and to discuss the consistency and relevance of such evidence. In addition, innovative directions will be mapped out that could positively impact the field like: the importance of network distributed effects; the need to integrate recent knowledge on the mechanisms guiding the effect of electrical fields on the brain state; task-related activities subtended by brain oscillatory/synchrony strategies.

Biography

Gianna C Riccitelli is Private Docent from Faculty of Biomedical Sciences, University of Italian Switzerland, Lugan, Switzerland. She has completed her PhD and postdoctoral studies from San Raffaele Vita-Salute University, Milan, Italy. She is the scientific leader of Neuropsychology and Behavioral Neurology Research Unit of Neurocenter of Southern Switzerland, Lugano Civic Hospital. She has published more than 55 papers in reputed journals.

Presenting author details
Full name: Gianna Carla Riccitelli
Contact number: 0041 91 811 6398
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