

Global Summit on Stroke

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New Approaches in Stroke Rehabilitation

Restoring sensorimotor, neuropsychological or cognitive functions after a stroke is usually unsatisfactory. At the same time increases the stroke frequency, and the number of those who survive such an event and therefore have high hopes for the rehabilitation treatment increases considerably in recent years. The talk provides an overview of new approaches in stroke rehabilitation that are currently in the experimental stage or at the edge of daily clinical neurorehabilitation including also pharmacologic agents for neuroenhancement.

Firstly, the lecture gives a comprehensive overview about the methods of peripheral electrical stimulation for enhancing corticospinal excitability in stroke patients to improve sensorimotor function of the upper and the lower extremity. Different levels of stimulation and different stimulation protocols in combination with motor training are discussed. A special method for peripheral electrical stimulation with a mesh glove is presented. Results of single and paired-pulse transcranial magnetic stimulation (TMS) and functional magnetic resonance imaging (fMRI) are presented to follow corticospinal excitability changes and to assess cortical brain reorganization changes after a treatment period with the mesh glove. Effects of mesh glove stimulation are compared to a control group receiving sham stimulation. A program with mesh glove stimulation to raise sensorimotor cortical excitability in the lesioned cortex applied before a physiotherapeutic training to raise effectiveness of a subsequent motor training is presented. In addition, peripheral vibration for enhancing corticospinal excitability and its neuromodulatory potential in stroke patients will be discussed. The talk will further concern methods for central sensorimotor, neuropsychological and cognitive stimulation by transcranial direct current stimulation (tDCS) and repetitive transcranial magnetic stimulation (rTMS) for inhibition and facilitation of lesioned and unlesioned brain structures for promoting cortical reorganisation after stroke. Another topic of the talk will be functional electrical stimulation (FES)-assisted active cycling in comparison with active cycling without FES concerning walking and balance in stroke patients. The results of a randomized controlled trial that was recently published in the Archives of Physical Medicine and Rehabilitation will be summarized and potential applications of FES in stroke rehabilitation will be discussed. Finally, the talk will deal with targets of a neuropharmacologic enhancement of sensorimotor, neuropsychological and cognitive functions in stroke patients to promote recovery and will present pharmacologic agents that hold promise for a future application in daily neurorehabilitation and will discuss its side effects and potential risks.

Biography

Stefan Golaszewski worked as a Neurologist at the University Innsbruck from 1995 to 2001, where he focused on clinical applications for functional Magnetic Resonance Imaging. From 2001 to 2002, he has worked at the Medical University. He has worked as Associate Professor at the Department of Neurology at the Paracelsus Medical University (PMU) Salzburg in Austria since 2005 and focuses on the investigation of cortical reorganization after stroke. Since 2010, he is Medical Head of the Neuroscience Institute of the PMU. He has published 120 papers in international peer-reviewed journals.

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