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Recent Advances in Neurorehabilitation an Editorial

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Neurorehabilitation

Traditional neurorehabilitation procedures have limited efficacy in patients of stroke, Parkinson's disease, spinal cord injury, severe brain injury, spasticity, and cognitive disorders. New technologies have been reported the effectiveness of rehabilitation. New technology of rehabiltation include robotic-assisted training, virtual reality, functional electrostimulation, non-invasive brain stimulation (NIBS, and to manipulate brain excitability & plasticity, as well as innovative approaches like assistive technology and domotics.

The exploration of neurorehabilitation technologies and NIBS on plasticity through the use of advanced technologies (i.e., functional MRI, near infrared spectroscopy, high-density EEG, etc.) may represent a surrogate outcome measure in near future. On the other hand, translational and back-translational models are also important to offer robust neurobiological grounds to current rehabilitative approaches.

The relation between central nervous system lesions to clinical features and outcomes represents the basis for personalized medicine in the neurorehabilitation, a promising perspective to explain the different individual response to the treatment, and to improve the quality of care. The definition of new approaches to the acute and chronic phase of neurological diseases and the most appropriate timing play a key role to optimize neurorehabilitation interventions. Moreover, new randomized controlled trial designs aimed to explore the role of combined drug and physiotherapy treatment are emerging.

Despite for many years evidence-based medicine was, to some extent, far from the field of neurorehabilitation, the interest for systematic reviews, meta-analyses, and consensus conferences is increasing.

The Topic "New Advances in Neurorehabilitation" included more than 20 good quality manuscripts of an interesting scenario on these technological and methodological advances, as well as new features and approaches to neurorehabilitation.

Stroke (motor) is traditionally one of the main topics in neurorehabilitation, because of the high prevalence of chronic stroke.

Recovery after spinal cord injury (SCI) is one of the hottest topics in neurorehabilitation study, because of the young age and the severe impairment in many patients.

Neurorehabilitation plays a major role in multiple sclerosis (MS) patients, who complain of their motor, sensory, cognitive impairment, and pharmaco-resistant pain.

Parkinson's disease (PD) patients complain a wide range of motor and non-motor symptoms, and neurorehabilitation procedures which are frequently used together with pharmacological treatment in these patients.

Pain has been recognized as a common problem in patients who are undergoing neurorehabilitation therapy, but impact on rehabilitative procedures and treatment has been largely not explored.

Patients with lesions of peripheral nervous system frequently undergo neurorehabilitation, among them, with brachial plexus lesions are those with the most severe impairment.

The recent literatures suggested that, by relating traditional rehabilitation techniques with new technological approaches, e.g., neuromodulation, biofeedback recordings, novel robotic and wearable assistive devices, the amount of recovery might improve in comparison to traditional treatments. Some contributions of the Research Topic dealt with robotic rehabilitation in upper-limb stroke and Multiple Sclerosis patients.

Because of the growing interest in neurorehabilitation, huge research is going on worldwide.