Avanthvadi Venkatesan Srinivasan

The Tamil Nadu Dr. M.G.R. Medical University, India

Sensory modulation in rehabilitation

The somatosensory system is a complex network of neurons, synapses and receptors, through which we perceive and navigate our environment. The afferent sensory system interacts via direct and indirect projections with the brainstem, cerebellum, subcortical and cortical structures. In late 19th century the role of sensory system in modulation of physical and mental rehabilitation was exploited. Sensory modulation helps in modulation the synaptic plasticity and long term potentiation and depression. Synaptic plasticity is a gradual process of ability of synapses to strengthen or weaken, in response to increases or decreases in their activity. The long-term potentiation (LTP) is a long-lasting enhancement in signal transmission between two neurons that results from stimulating them synchronously. Sensory modulation is applied clinically in rehabilitation of various neurological conditions like motor rehabilitation after stroke, via electrical stimulation, tactile stimulation of the faucial pillars used for the treatment of dysphagia. Mirror therapy for phantom limb pain where the neuromatrix theory of phantom limb pain explain tactile and proprioceptive inputs from the face and tissues near the residual limb take over specific regions of the brain. Extinction of referred sensation based on topographically organised inter-hemispheric inhibition mediated by commissural pathways helps in alleviating symptoms of phantom limb pain. Geste antagoniste or sensory trick was alleviating manoeuvres relives dystonia. Virtual reality (VR) environments used to simulate natural events and social interactions in rehabilitation of motor weakness. Thus Sensory modulation has the capacity to regulate and organize the degree, intensity and nature of responses to sensory input in a graded and adaptive manner, which allows the individual to achieve and maintain an optimal range of performance and to adapt to challenges in daily life.

Biography

Avathvadi Venkatesan Srinivasan, driven by his quest for excellence joined Madras Medical College (MMC) and received MD (General Medicine) in 1978. Later he pursued and received DM in Neurology from his alma mater. His thirst for research, skills and the latest development in Neurology made him find his way to the National Institute of Neurology and Neurosurgery, his pioneering research work on Neuroleptic Malignant Syndrome got him bestowed with the PhD degree in 2002. It made him the first ever recipient in Neurology from the Tamil Nadu Dr. M.G.R. Medical University, since its inception in 1988. His path breaking research (6 papers) in Phantom limbs, Stroke etc., with Padma Bhusan Dr. V S Ramachandran, Director, Center of Brain and Cognition, University of San Diego remain acclamatory to his undisputed authority in Behavioral Neurology and Movement disorders. He authored more than 100 scientific papers; dozens of his other work have found places in reputed medical journals and has published 12 chapters. His research papers presented, won acclaims in 60 National conferences and in 25 International conferences held in UK, USA, Japan, Australia, China, Europe and other countries. He is the only one from India to collaborate with Dr. V S Ramachandran, who is the first recipient of Padma Bhusan for his contribution to Neurosciences.

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