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Sensory modulation in peripheral and central lesions of somato sensory system

VS Ramachandran and AV Srinivasan et al (1998) described allesthesia and extinction of referred sensations in brachial plus lesions. K. Sathian et al (2000) suggested that intermanual referral of sensations can occur after central lesions of the Somato sensory system. This communication considers eight patients with five central lesions and three peripheral lesions of the Somato sensory system. **Methodology & Theoretical Orientation:** Ecological model of sensory modulations has external and internal dimensions. This refers both physiological and behavioural responses. Dysfunction in sensory integration is the ability, modulate, discriminate, co-ordinate or organise sensation adaptively. Eight patients aged between 19-51 with brachial plexus lesion one, amputation 2 patients, hemiparesis with hemisensory deficit five patients were analysed. Patients vibration and kinesthesia were tested. Stimuli were applied manually. All patients had Magnetic Resonance Imaging of the Brain and ENMG studies. **Findings:** Central lesions: All the five stroke patients showed intermanual referral of sensations between 3rd and 4th month after developing hemisensory deficit. Three had thalamic stroke and two patients has temporo-parietal infarct. Intermanual referred sensations to the affected hand in these patients were not referred to the affected leg. Intermanual referred sensations were poorly localised and the facial sensations were referred with increased intensity in the thalamic patients. When applied pressure on the normal hand resulted in the extinction of pain sensation side and pain recurred within one minute of the pressure being relieved. Peripheral Lesions: Amputation of Limbs: Both the patients (below elbow and knee amputation) showed intermanual referral sensation within ten days. The referred sensation of touch and vibration lacked spatial organisation and poor localization with a relatively high threshold. Brachial Plexus Lesion: Patient had sensation intermanually referred in a topographically organised manner in the phantom limb. Intriguingly, simultaneous stimulation of the specific region (e.g. thumb) of the face and the corresponding finger of the right hand resulted in a mutual cancellation or extinction of the referred sensations in the phantom limb. **Conclusions & Significance:** 1.0 Intermanual referral of the sensations in the phantom limb occurred immediately in Brachial plexus lesion and amputation, whereas it occurred after a delay of three month is in hemiparesis with hemisensory deficit. This can be utilised for extinction of pain in the paretic side and in the Phantom limb. 2.0 Sensations were referred intermanually in a topographically organized manner in Brachial Plexus lesions, whereas in amputations and hemiparesis with hemisensory deficit, lacked spatial and poor localization. **Disclosure:** Dr. Venkatesan has nothing to disclose. **Recent Publications:** 1. Willis WD Jr.: The sensory system with emphasis on structures important for pain. Brain Res Rev 2007; 55:297-313. 2. Miller LJ, Reisman JE. An ecological model of sensory modulation, Chapter 4, 292-324. 3. DOBKIN BH. The clinical science of neurological rehabilitation. Second edn, Chapter 4, 292-324. 4. Srinivasan AV, Ramachandran VS, Ramachandran R, et al, 127th Annual Meeting of the AMERICAN Neurological Association; Oct 12 to 16, 2002. Marriot Marquis Hotel, New York. 5. Srinivasan AV, Velmurugendran CU, Roger-Ramachandran, et al., Anaesthesia and extinction of referred

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Biography

He is Emeritus Professor in the Tamil Nadu Dr. M.G.R. Medical University; Former Adjunct Prof. – IIT (Madras) – (Bio – Technology) and Visiting Professor in Cleveland – Ohio – USA; Hershey Medical College, USA and Former Adjunct Prof. – IIT (Madras) – (Bio – Technology)

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