

Electroencephalography Activity during Sensory Organization Balance Test

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Abstract : Postural balance plays essential role throughout life in daily activities. Somatosensory, visual and vestibular inputs play the fundamental role in maintaining body equilibrium to balance the posture. The aim of this study was to find out electroencephalography (EEG) responses during balance activity of young people during Sensory Organization Balance Test. The outcome of this study will help to create the fitness and neurorehabilitation plan. 25 young people (25 \pm 3.1 years) have been analyzed on Balance Master NeuroCom[®] with the coupling of Brain Vision 32 electrode wireless EEG system during the Sensory Organization Test. From the results it has been found that the balance score of samples is significantly higher under the influence of somatosensory input as compared to visual and vestibular input ($p < 0.05$). The EEG between somatosensory and visual input to balance the posture showed significantly higher ($p < 0.05$) alpha and beta activities during somatosensory input in somatosensory, attention and visual functions of the cortex whereas executive and motor functions of the cerebral cortex showed significantly higher ($p < 0.05$) alpha EEG activity during the visual input. The results suggest that somatosensory and attention function of the cerebral cortex has alpha and beta activity, respectively high during somatosensory and vestibular input in maintaining balance. In patients with balance impairments both physical and cognitive training, including neurofeedback will be helpful to improve balance abilities.

Keywords : balance, electroencephalography activity, somatosensory, visual, vestibular

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