

Reliability and Validity of Integrated Proprioception Screening Scale & Its Sensitivity in Parkinson's disease

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Abstract

Proprioception is the awareness of the body position, orientation, movement and sensation of force. It is a sense which indicates whether the body is moving with required effort and as well as where the different parts of the body are located in relation to each other. Proprioception testing involves a combination of testing methods like kinaesthesia, joint position sense and sense of force testing. There are different scales available for assessing proprioception like Fugl-Meyer assessment sensory sub scale, Nottingham sensory assessment scale and Integrated Proprioception Screening Scale (IPSS). The proposed study was done on the subjects with age more than 60 yrs and tester, retester and inter-tester reliability and validity was measured. This study also checked the sensitivity of IPSS in Parkinson's disease patients.

Key words: Proprioception, Integrated Scale, Reliability, Validity, Sensitivity, Parkinson's disease

Introduction

Proprioception is the awareness of the body position, orientation, movement and sensation of force (Sherrington, 1906). It is a sense which indicates whether the body is moving with required effort and as well as where the different parts of the body are located in relation to each other (Leibowitz *et al.*, 2008). The process of proprioception occurs along the afferent pathways of the sensorimotor system. The sensorimotor system covers the whole process from a sensory stimulus to muscle activation, from acquisition of a sensory stimulus and conversion of the stimulus into a neural signal, transmission of the neural signal via afferent pathways to the Central Nervous System (CNS), processing and integration of the signal by the various centres of the CNS and motor response resulting in muscle activation for the performance of various tasks and joint stabilization (Lephart *et al.*, 2000).

The proprioceptive information is received from the sensory neurons located in inner ear (motion and orientation) and

in the stretch receptors located in the muscles and the joints supporting ligaments. It can be conscious or subconscious. The conscious proprioceptors are the kinestheseptors or joint receptors. The subconscious proprioceptors are Muscle Spindle, Gogli Tendon Organ (GTO) and Vestibular receptors. The subconscious proprioception is transmitted to cerebellum and conscious proprioception is transmitted to the cortex. Conscious proprioception is regulated by the lemniscal system that is dorsal column. This pathway begins in joint receptors and ends in cortex. The conscious proprioception enables the cortex to refine voluntary movements for skillful activities. Subconscious proprioception is mediated by the spino-thalamic tracts which begin in muscle spindle and GTO and terminates in cerebellum. It is concerned with muscle tension, muscle length and speed of movement (McCormack and Feuchter, 2000).

There are numerous types of afferent sensory organs (mechanoreceptors) found in the various