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Correlation Between Lower And Higher Order Sensory Functions And Fine And Gross Motor Function In Dominant And Non-Dominant Hand Of Patients With Choronic Stroke

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Introduction: To investigate the correlation between lower and higher order sensory functions and manual dexterity as well as Identify factors affecting upper extremity motor function(UEMF) in subjects with chronic stroke.

Methods: In this correlational study, seventy chronic stroke subjects (48 male and 22 female) by mean age of 56.94 (±12.92) years and mean time after stroke of 3.01 (±2.64) years were selected by simple nonprobability method. Lower order sensory function (i.e., light touch threshold), higher order sensory functions (i.e., tactile acuity, weight and texture discrimination, haptic performance and wrist proprioception) were measured by Weinstein enhanced sensory test, two point discrimination, wrist position sense test, hand active sensation test and haptic object test, respectively. The gross and fine manual dexterity were measured by Wolf Motor Function Test (WMFT), Box and Block Test(BBT) and Purdue Pegboard (PPB) test. The step by step regression model was used to investigate the sensory determinants of motor function.

Results: A weak to high significant correlation (r =0.25 to 0.80) was found between sensory predictors and motor outcomes. The regression models explained 19.8%, 30.3% and 52.3% of variancein motor function measures of the PPB, BBT and WMFT, respectively. The tactile threshold ($p<0.001$) was the most relevant predictor in all stepwise models for all motor outcomes in dominant or non-dominant hand , followed by tactile acuity, haptic performance and wrist proprioception ($p< 0.05$). The weight and texture discrimination was not included in any outcome models.

Conclusion: The results of present study showed that tactile threshold as lowr order sensory function is the most relevant predictor for UEMF in stroke. The results reinforce that rehabilitation interventions focused on tactile threshold may be best able to impact UEMF in stroke subjects.

Key words: Chronic stroke, fine and gross motor function, sensory performance

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