



## Service Priorities and Programmes Electronic Presentations

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### **Neuro-hydrotherapy Program Enhanced the Postural Control, Balance Confidence and Mobility Performance in People with Neurological Disorders**

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#### **Introduction**

Hydrotherapy was shown to be effective in enhancing functional task performance in clients with chronic stroke and Parkinson's disease. However, there is paucity of literatures in the contextual enhancement of the patients' ability to maintain advanced postural control in sensory compromised conditions and the self-perceived balance confidence in everyday life situation.

#### **Objectives**

To investigate the effectiveness of an adjunct neuro-hydrotherapy program in enhancing advanced postural control, balance performance, mobility performance and self-perceived balance confidence in patients with neurological disorders.

#### **Methodology**

Methodology of Pretest-posttest Control Group Design was adopted. Patients with chronic neurological disorders (onset>6months) who could walk without manual assistance were recruited from the out-patient physiotherapy unit of Kowloon Hospital. Exclusion criteria included any contraindication to hydrotherapy. Subjects in control group received 60-minute conventional physiotherapy three times a week for 6 weeks while that of intervention group received additional 30-minute neuro-hydrotherapy program twice a week for 6 weeks. The program focused on upright task-specific exercise against water turbulence. Assessments were conducted at baseline and week 6. Outcome measures included posturography study using Sensory Organization Test(SOT), Berg Balance Scale(BBS) for fall risk assessment, Timed Up and Go(TUG) test for functional mobility performance and Activities-specific Balance Confidence(ABC) scale for self-perceived balance confidence in everyday life situation.

#### **Result**

Forty-nine subjects were recruited (Intervention group n=30, mean age=47.84+/-13.30 years; control group n=19, mean age=53.89+/-13.07 years). Demographic characteristics and baseline performance between two groups were

comparable. Two-way repeated measures ANOVA showed significant time effect in BBS( $p < 0.001$ ), SOT composite score( $p = 0.005$ ) and ABC( $p = 0.014$ ). Significant interactions were shown in SOT condition #5 [absence of visual and conflicting somatosensory information]( $p = 0.043$ ), SOT vestibular ratio( $p = 0.042$ ) and TUG ( $p = 0.007$ ). Post-hoc analysis showed significant within-group improvements in SOT condition 5 (from  $61.81 \pm 9.62$  to  $69.20 \pm 8.10$ ,  $p < 0.001$ ), SOT vestibular ratio (from  $0.66 \pm 0.11$  to  $0.74 \pm 0.08$ ,  $p = 0.001$ ) and TUG (from  $17.74 \pm 7.14$  seconds to  $15.48 \pm 6.19$  seconds,  $p = 0.001$ ) in intervention group post-program. The neuro-hydrotherapy program could further enhance the functional mobility performance and advanced postural control in sensory compromised condition such as outdoor walking at night or getting on-off escalator in chronic neurological patients. The novel finding of enhanced vestibular system (faster channel for sensory balance strategy) translated significant clinical implication in quicker and safer defense against fall injuries for this high risk vulnerable clientele.