Service Priorities and Programmes

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Effectiveness of structured hydrotherapy program for enhancing postural control, balance performance and mobility performance in people with neurological disorders

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Introduction

Individualized hydrotherapy programs were shown to be effective in enhancing the functional task performance in people with chronic stroke and Parkinson's disease. However, the contextual implication on the clients' ability to maintain postural control in everyday life situations including sensory compromised conditions and the self-perceived balance confidence is not reported.

Objectives

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

Methodology

Twenty-one patients with chronic neurological disorders (onset>6months, mean age50.19±11.90) were recruited from the out-patient physiotherapy unit of Kowloon Hospital and Queen Elizabeth Hospital. Inclusion criteria included the ability to follow instruction, able to walk without manual assistance and having no contraindications for hydrotherapy. The 30-minute adjunct hydrotherapy program was conducted twice a week for six weeks focusing on upright task-specific exercises against water turbulence. Assessments were conducted at baseline, 6th and 12th week. All outcome measures including posturography study by 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-Chinese version for self-perceived balance confidence were analyzed by non-parametric analysis using Friedman's Two-Way Analysis of Variance by Ranks.

Result

Significant improvement among three time points were found in SOT(composite score and vestibular ratio, $p<0.001$ and $p=0.006$), BBS($p=0.001$), TUG($p<0.001$) and ABC($p=0.009$). Pairwise comparison showed that there was significant improvement right after the program in SOT composite score(74.24±6.91 at baseline versus 80.19±5.22, $p=0.001$), BBS(47.57±5.08 at baseline versus 50.81±3.51, $p=0.013$), TUG(18.53±7.66 at baseline versus 15.87±6.77, $p=0.010$) and ABC(72.20±16.41 at baseline versus 78.61±18.15, $p=0.018$). Significant improvements were shown at week 12 as compared with baseline in SOT composite score(74.24±6.91 at baseline versus 80.85±6.27, $p=0.003$), SOT vestibular ratio(0.63±0.18 at baseline versus 0.77±0.12, $p=0.005$), BBS(47.57±5.08 at baseline versus 52.15±2.41, $p=0.003$), TUG(18.53±7.66 versus 15.24±7.45, $p<0.001$) and ABC(72.20±16.41 at baseline versus 82.55±20.11, $p=0.032$). In conclusion, the adjunct hydrotherapy program was effective in enhancing postural control, balance and mobility performance and self-perceived balance confidence for clients with neurological disorders. The significant improvement in utilizing the fast vestibular system for balance reflected the merit of hydrotherapy in enhancing functional balance in everyday life demanding context such as getting on and off public transport.