

Aquatic Therapy Improving Balance Function of Individuals with Stroke: A Systematic Review with Meta-Analysis

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Abstract : Introduction: Improving balance function for individuals after stroke is a crucial target in physiotherapy. Aquatic therapy which challenges individual's postural control in an unstable fluid environment may be beneficial in enhancing balance functions. The purposes of the systematic review with meta-analyses were to validate the effects of aquatic therapy in improving balance functions for individuals with strokes in contrast to conventional physiotherapy. Method: Available studies were explored from three electronic databases: PubMed, Scopus, and Web of Science. During literature search, the published date of studies was not limited. The study design of the included studies should be randomized controlled trials (RCTs) and the studies should contain at least one outcome measurement of balance function. The PEDro scale was adopted to assess the quality of included studies, while the 'Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence' was used to evaluate the level of evidence. After the data extraction, studies with same outcome measures were pooled together for meta-analysis. Result: Ten studies with 282 participants were included in analyses. The research qualities of the studies were ranged from fair to good (4 to 8 points). Levels of evidence of the included studies were graded as level 2 and 3. Finally, scores of Berg Balance Scale (BBS), Eye closed force plate center of pressure velocity (anterior-posterior, medial-lateral axis) and Timed up and Go test were pooled and analyzed separately. The pooled results shown improvement in balance function (BBS mean difference (MD): 1.39 points; 95% confidence interval (CI): 0.05-2.29; $p=0.002$) (Eye closed force plate center of pressure velocity (anterior-posterior axis) MD: 1.39 mm/s; 95% confidence interval (CI): 0.93-1.86; $p<0.001$) (Eye closed force plate center of pressure velocity (medial-lateral) MD: 1.48 mm/s; 95% confidence interval (CI): 0.15-2.82; $p=0.03$) and mobility (MD: 0.9 seconds; 95% CI: 0.07-1.73; $p=0.03$) of stroke individuals after aquatic therapy compared to conventional therapy. Although there were significant differences between two treatment groups, the differences in improvement were relatively small. Conclusion: The aquatic therapy improved general balance function and mobility in the individuals with stroke better than conventional physiotherapy.

Keywords : aquatic therapy, balance function, meta-analysis, stroke, systematic review

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