Reliability and validity of the 10-m walk test in dual-task conditions among people with chronic stroke

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Background and purpose: The ability to perform a secondary task while walking was suggested to be highly related to “real-life” mobility. There has been a lack of a reliable and validated test for assessing dual-task ability of stroke patients during walking. The aim of this study was to assess the test–retest reliability and construct validity of the 10-m walk test in dual-task conditions among people with stroke.

Methods: Participants were instructed to walk along a 10-m pathway at their comfortable speed under single and two dual-task conditions (naming fruits and serial 3 subtractions). Walking time in each condition and correct response rate (CRR; the number of correct response divided by walking time) for the added cognitive tasks were recorded. The time-matched CRR of the two cognitive tasks was also measured to assess the participants' performance in the single cognitive task condition. Participants were reassessed again within 1 week. Wilcoxon tests were used to compare the performance in 10-m walk test between single and different dual-task conditions. Intra-class correlation coefficients were used to examine the test–retest reliability and the intercorrelations among the walking times and CRR measured in the various test conditions. Spearman’s rank correlation coefficient was used to examine the intercorrelations among the walking times and CRR measured in the various test conditions.

Results: Twenty-eight chronic stroke patients (9 women and 19 men, mean aged 61.6 ± 6.9 years; > 6 months after onset) participated in this study. The participants were found to take longer to complete the 10-m walk no matter which secondary task (verbal fluency, p < 0.001; serial 3 subtractions, p < 0.001) was added. The CRR was not changed significantly for both naming fruit (p = 0.94) and serial 3 subtractions (p = 0.29) in dual-task conditions when compared with their respective time-matched single-task condition. In all three dual-task conditions, the reliability of the time taken to complete the 10-m walk was excellent (ICC2,1 > 0.80, p < 0.001), whereas the reliability of the CRR was moderate (naming fruit: ICC2,1 = 0.59, p < 0.001; serial 3 subtractions: ICC3,1 = 0.64, p < 0.001). The walking time in all three dual-task conditions are significantly correlated with each other (p > 0.80, p < 0.001). The correlations between walking time and CRR under dual-task conditions and those under single-task conditions were moderate to excellent (p = 0.59–0.86, p < 0.001).

Conclusion: When a secondary cognitive task was added, performance in the 10-m walk test was poorer whereas that in the cognitive task remained stable, indicating that priority was given to the cognitive task. Both walking time and CRR measurements of all dual-task conditions in the 10-m walk test at a comfortable speed were found to be reliable and valid. However, walking time is a better outcome for assessing dual-task ability due to its higher reliability.

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Efficacy of a perioperative physiotherapy care programme for patients undergoing abdominal surgery in Tseung Kwan O Hospital

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Background and purpose: Postoperative pulmonary complications (PPCs) such as atelectasis and pneumonia are common in patients following major abdominal surgery, which in turn can lead to suboptimal oxygen saturation and limit tissue healing. Lung expansion is a well-known strategy to prevent PPCs at the early postoperative phase. Patient’s active participation in lung expansion is important. To enhance patients’ compliance and participation, the Physiotherapy Perioperative Care Program (PPCP) was formulated. The aim of this study is to investigate and evaluate the effectiveness of PPCP for optimising oxygen saturation (SpO2), preventing PPCs, and hastening rehabilitation.

Methods: This is a retrospective, pre- and post-test study. From July 2012 to December 2012, a convenient sample of high-risk patients with a smoking history, obesity, a pre-existing lung disease, functional dependence, and age ≥ 60 years who received major abdominal surgery was recruited to participate in PPCP. It consisted of two phases. (1) Preoperative phase, Preoperative chest physiotherapy such as education on the importance of early mobilisation and postoperative exercise was provided to the patients, carers, and nurses in charge. Patients were also prescribed with a spirometer and the Bed-side Chest Physiotherapy Reminder Card with the exercise regime illustrated. The exercise regime included 10 repetitions of chest expansion and 20 repetitions of ankle exercise hourly. (2) Postoperative phase. Intensive chest expansion, coughing exercise, bronchial hygiene, appropriate positioning, and progressive mobilisation exercise were provided by a physiotherapist daily. Reinforcement of postoperative exercise as showed in the exercise card was provided by nurses and carers after physiotherapy services hours.

The outcomes of this study included Inspiratory capacity measured by a spirometer, SpO2 on Days 1–3, incidence of documented PPCs, preoperative and predischarge Modified Functional Ambulation Categories (MFAC), and discharge destination.

Results: Sixty-seven patients participated in the programme. Overall, the patients achieved an average of 70% of normal inspiratory capacity upon discharge. The mean SpO2 on Days 1–3 was maintained at 98%, which is above the recommended value. PPCs occurred in 4.4% of patients (n = 3), which is lower than the rate of 9–40% reported in previous research.