Cystic fibrosis patients' performance on Modified Shuttle Walk Test

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Background: The Modified Shuttle Walk Test (MSWT) is a frequently used field test to identify deficiency in cardiorespiratory fitness, to evaluate patients for lung transplant and to establish interventions aimed at improving exercise capacity. It is a valid and reliable measure of exercise performance in CF, as it is easily administered, inexpensive and can be conducted in limited space.

Objectives: To analyse CF patients’ performance on the MSWT.

Methods: CF adolescents and adults were recruited for MSWT within 48h before hospital discharge. Lung function was categorized according to the CFF. Distance walked, cardiac overload and oxygen saturation (SpO2) were evaluated.

Results: All values are mean (SD) if not otherwise reported. 41 patients (48.8% females) aged 18.4 yrs (4.47), with FEV1% pred. of 78% (27.23) were enrolled. The MSWT distance was 807.7 m (95%CI 725.95–889.42), SpO2 93.3% (2.72), maximum heart rate (HRmax) 167.5 (15.6) bpm. Median values (IQR) for patients reported Borg scale dyspnea increased from 0 (1) at baseline to 5 (3) at the end of the test. Corresponding figures for fatigue were 0 (0.5) and 4 (5), respectively; 70.7% of patients achieved HRmax above 80% of pred.HRmax. There was a significant difference in mean MSWT distance among FEV1% categories (p=0.002), whereas this was not the case for HRmax and FEV1% categories (p=0.104). The MWST distance correlated with FEV1%spred. (r=0.369), p=0.017.

Conclusion: Most of the patients reached their maximal cardiorespiratory capacity. The remaining were probably limited by the severity of lung disease as supported by the fact that lung function impairment affected their exercise performance.

Background: The Modified Shuttle Walk Test is a validated field test used to assess exercise tolerance in patients with Cystic Fibrosis (CF). Studies confirmed its utility in evaluating improvements after an intravenous antibiotic treatment in both CF adults and children. To date, its relation to longer term clinical course of CF paediatric patients has not been determined.

Aims: To determine changes over time in the MSWT performance in CF children and adolescents.

Methods: 34 CF children and adolescents (19 F) (mean age 12.3 yrs, range 6–17 and FEV1%spred 77.5, range 48–103) were recruited. MSWT performance, spirometry, anthropometric measures were evaluated at recruitment and after 1.5 year. Clinical status was evaluated by number and days of hospitalization in the same period compared to the previous year.

Results: Lung function did not significantly change over time, but days (p=0.03) and number (p=0.02) of hospitalizations significantly increased in the observation period compared to the previous year. Height increased significantly (p<0.0001). Both MSWT (p=0.001) and height-corrected MSWT performance (p=0.03) improved significantly. The improvement in MSWT distance was not significantly correlated with changes in FEV1%spred (p=0.38), CV%spred (p=0.38) and FE25−75%spred (p=0.82).

Conclusion: Our data indicate that improvements in MSWT in children and adolescents are determined by growth and do not necessarily reflect clinical status. Longer studies are needed to confirm its validity in predicting clinical deterioration and identifying patients at higher risk.