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Cystic Fibrosis Research News

Title:

Minimal detectable change and minimal clinically important differences in modified shuttle walk test in children and adolescents with cystic fibrosis

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What was your research question?

Is the modified-shuttle walk test a reliable test in children and adolescents with cystic fibrosis? Which is the minimal detectable change and the minimal clinically important differences for the test in children and adolescents with cystic fibrosis? Are there differences between children and adolescents with and without cystic fibrosis for exercise tolerance and strength?

Why is this important?

Exercise tolerance is positively associated with health-related quality of life and survival in patients with cystic fibrosis. Therefore, a detailed exercise test is required before starting exercise training to provide safe and effective training recommendations. The modified shuttle walk test allows us to evaluate exercise tolerance in an inexpensive and in a manner that is accessible to clinicians, without requiring specific and costly instrumentation. In addition, it is important for clinicians to know whether changes in exercise capacity are clinically relevant and whether they are related to therapeutic interventions. Hence, it is essential to establish the clinically important minimum difference.

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What did you do?

The modified shuttle walk test has been shown to be reliable and valid in adults with cystic fibrosis; however, to date there have been no previous studies assessing its reliability in children and adolescents with cystic fibrosis. For this reason, we evaluated the validity and reproducibility in children and adolescents with cystic fibrosis, as well as their non-CF peers, allowing us to compare possible differences between the two populations. Finally, we applied a home training program to establish what is the minimum change necessary for the patient to perceive an important clinical improvement in their exercise tolerance.

What did you find?

The modified-shuttle walk test is a reliable test yielding excellent results in children and adolescents with cystic fibrosis. Based on our results, it can be applied with accuracy to children and adolescents with cystic fibrosis with well-preserved lung function. The minimal detectable change for the modified-shuttle walk test is 97.08 m in children and adolescents with cystic fibrosis. In terms of exercise tolerance and peripheral muscle strength, we obtained better results in healthy controls than in children and adolescents with cystic fibrosis.

What does this mean and reasons for caution?

This study confirms the applicability of the modified-shuttle walk test in this age group with cystic fibrosis, so it could be an alternative when laboratory-based exercise testing cannot be performed. The results also allow us to determine whether there has been a real change and clinical relevance with regard to exercise tolerance. In this way, it is possible to decide whether patients present impaired physical capacity and also to identify the effectiveness of the treatments aimed at alleviating or improving those aspects. However, we believe that all these findings must be interpreted with caution given there was no pulmonary obstruction in our patients.

What's next?

To find treatment protocols that can overcome the real change and clinical relevance with regard to exercise tolerance that we propose in this study, as well as to study how the growth and the anthropometric characteristics may influence these values, due to the time between the evaluations.

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