

Repeated measurement of a six-minute walk test has no added value to a single measurement in children with chronic dilated cardiomyopathy

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Introduction : The six-minute walk test (6MWT) is a feasible test in children with chronic heart failure secondary to dilated cardiomyopathy (DCM) and may be used to identify children with a higher risk of death or heart transplantation. The objective of this study was to determine if repeated measurement of 6MWT has added value in addition to a single measurement in predicting outcome in children with DCM.

Methods: Prospective multi-center cohort study including ambulatory DCM patients ≥ 6 years. A standardized 6MWT was performed at a 6-monthly interval. The distance walked in 6 minutes was expressed as percentage of predicted (6MWD%) based on age and gender specific norm values. We compared change over time in 6MWD% in patients reaching the primary endpoint (composite of death or heart transplantation) to patients who remained endpoint free, using a linear mixed effects (LME) model.

Results: In 57 eligible patients, we obtained $n=277$ 6MWTs, a median of 4 tests (IQR 2-6) per patient during a median of 2.9 years of follow-up (IQR 1.5-5.1). Fourteen patients reached the primary endpoint. Both in patients with and without the primary endpoint 6 MWD% remained fairly constant over time. The mean 6MWD% (based on the LME model) was significantly lower in patients with a primary endpoint than in those without (54% versus 73%; $p<0.001$; see Figure 1). A 6MWD% lower than 63% was associated with an increased risk of heart transplantation or death (hazard ratio 10.8; 95% CI 2.4 to 49).

Conclusions: Children with DCM who died or underwent heart transplantation have systematically reduced 6MWD%. Since their performance is stable throughout follow-up, repeated 6 MWT have little value over a single test within this time window.

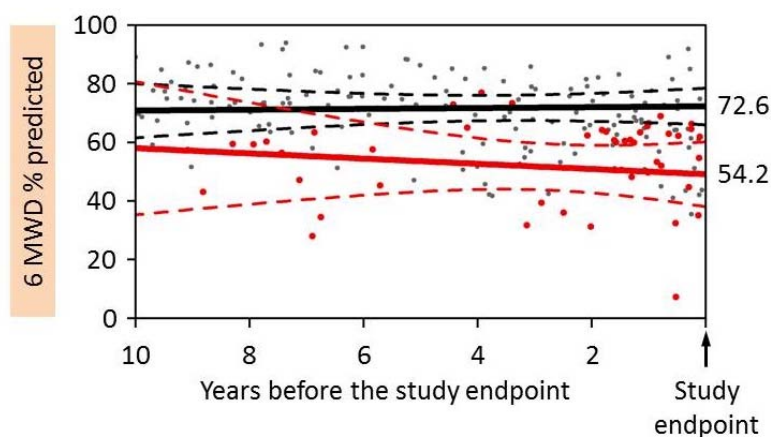


Figure 1. Serial measurement of 6MWD expressed as percentage of predicted (6MWD%)
The average estimates of the longitudinal trajectory of 6MWD%: the black line indicates the patients without a primary endpoint, the red line the patients with a primary endpoint. The dashed lines depict the 95% confidence interval