Changes in Four-Stair Climb (4SC) over Two Years in Duchenne Muscular Dystrophy (DMD): Consistency across Data Sources and Prognostic Factors

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Background: Since DMD is a rare disease, the prospect of using real-world data to augment or replace placebo in randomized controlled trials, or to contextualize treatment outcomes, is important for drug development. To serve these purposes, it is important to understand the consistency of real-world outcomes across data sources and the extent to which different patient characteristics are prognostic of those outcomes. We investigated these issues for 2-year changes in the timed four-stair climb (4SC) among patients with DMD.

Methods: Patients were boys with DMD from two real-world data sources: (1) UZ Leuven, a pediatric neurology clinic in Belgium, and (2) the PRO-DMD-01 study, a prospective observational study (data provided by CureDuchenne, a patient advocacy organization). All non-overlapping ~2-year intervals of patient follow-up with data on 4SC velocity were used in the analysis and subjected to the following inclusion criteria: aged 6-18 years, used corticosteroids for at least 6 months and 4SC time < 12 seconds. Longitudinal mixed effects models for 2-year changes in 4SC velocity were used to investigate prognostic factors and to compare outcomes across data sources.

Results: A total of 159 boys contributed 183 ~2-year follow-up intervals (113 boys from PRO-DMD-01 contributed one interval each; 46 boys from Leuven contributed 70 intervals). At the beginning of these follow-up intervals, mean age was 9.3 years; mean 4SC time and velocity were 3.8 seconds and 1.4 stairs/second, respectively. Significant predictors of 2-year change in 4SC velocity included baseline 4SC and rise velocities, baseline six-minute walk distance (6MWD), steroid duration, deflazacort use, height, weight and body mass index (BMI). Together these factors explained about 30% of the variation in 4SC velocity outcomes across patients. Outcomes did not differ significantly across data sources.

Conclusion: Analyses of 2-year changes in 4SC velocity in DMD should incorporate important prognostic factors, including multiple measures of ambulatory function beyond baseline 4SC. The consistency of 4SC outcomes across the studied cohorts is encouraging for the use of these real-world data to inform DMD drug development.

Keywords: Duchenne muscular dystrophy, functional outcomes, prognostic factors, clinical trials, real-world data

Instructions to authors

Submission deadline: October 22th, 2018

Only abstracts submitted in English and via the website will be processed.

- The abstract should include the first author's and all co-authors' names and affiliations of the first author and co-authors.

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