**Background**

With the emergence of experimental therapies for DMD, it is crucial to understand the natural history of this disorder to properly design clinical trials. The aims of this study are:

1. to assess the motor function decline in DMD boys treated according to the standards of care;
2. to describe the rate of motor function decline in different skippable population;
3. to describe the natural history of DMD boys who were treated with steroids below five year of age.

**NorthStar Clinical Network**

This is a collaboration of 20 neuromuscular centres in the UK, collecting in a web-based database longitudinal data on ambulant DMD boys treated with steroids. To date, there are over 500 patients registered in the database.

**Methods**

Through the UK NorthStar Network and database, clinical data systematically collected from 2004-2012 on 483 DMD boys followed-up in 17 UK neuromuscular centres were included in the analysis.

**Methods**

Our study focuses on the Northstar Ambulatory Assessment (NSAA) as a primary outcome measure. Additionally, for the analysis of the genetic subpopulation, we included data from 84 DMD boys followed-up in Rome.

**General characteristics**

![General characteristics](image)

**Age at loss of ambulation**

Loss of ambulation (LOA) was reported in 129 individuals. Median LOA = 13 years (including all treatment regimens).

Two years prior to loss of ambulation, the mean total score for the NSAA was 13.5 units.

We found no evidence of a significant difference in time of LOA when comparing the different skippable subgroups to the general DMD population.

**NorthStar Ambulatory Assessment**

We previously reported that DMD boys gain motor function up to age of 7, when they start declining (Ricotti et al JNHP 2012).

In the analysis, we included all the treatment groups. The slope of decline is approximately 3.5 units in NSAA per year. At 8 years of age, the population average NSAA score is of 24. At 10 years of age it is estimated to be 17 units. We adjusted the model for previous time on steroids.

**Age at loss of Ambulation**

![Age at loss of Ambulation](image)

**Young DMD and early treatment**

We compared boys who started steroids before 5 years with boys who started steroids between 5 and 9 years of age.

Late starters on daily or intermittent prednisolone (n = 222): mean age: 6.7 years.

Early starters (n = 36): mean age = 4.5 y, the earliest steroids were started= 3.4 years, 19 on intermittent and 17 on daily prednisolone.

Boys on steroids < 5 y.o. gain better motor function increasing by an extra 2 units in NSAA per year up to 7 years of age (p<0.04), with a mean NSAA of 29 vs 25.

**Conclusion**

Our study provides insights on the current natural history in a large cohort of DMD boys, which help when selecting inclusion criteria in the design of clinical trials.

Including all the steroid treatment groups, after age 7, when motor function decline starts, we observed that the rate of decline on the NSAA is of about 3.5 units per year. Two years prior to loosing ambulation the average NSAA total score was 13.5.

When compared to the general DMD population, boys with mutation skippable by exon 44 and 46 decline at a slower rate of more than 1 NSAA unit per year. When populations skippable by exon 53 and 52 show a faster decline compared to the general DMD population, at an average rate of 0.8 NSAA unit per year. We found no significant difference in the other skippable cohorts.

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