Is Lean Body Mass a Good Proxy for Muscle Strength Measurement in Boys with Dystrophinopathy?

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Methods

Participants/Setting

Valid and sensitive outcome measurements of muscle strength are important for clinical trials for treatment of boys with Duchenne (DMD) and Becker (BMD) muscular dystrophy. As voluntary effort during muscle strength measurement is affected by cooperation and fatigue, lean body mass (LBM) is a promising proxy. LBM can be obtained from dual-energy X-ray absorptiometry (DXA) measured at rest. A previous study has examined the relationship between muscle strength measurement and regional LBM.¹ Longitudinal analyses have not been performed. The purpose of this study was to examine the validity of LBM as a proxy for muscle strength.

Participants were recruited from outpatient clinics at a university medical center. Data were collected in a clinical research setting with IRB approval. Twenty-six ambulatory boys with dystrophinopathy (24 with DMD and 2 with BMD) were evaluated at a single baseline visit (cross-sectional study). Mean age was 8.6 +/- 2.0 years (range 5.2 -13.3 years). Eight of the 26 boys with DMD were followed over one year (longitudinal study). Mean age at baseline was 8.6 +/- 2.2 years (range 5.2-10.9 years).

Informed consent was obtained for all participants. For the cross-sectional study, participants underwent a whole body DXA scan (Hologic 4500 A) in a standard supine position to obtain LBM. Peak isometric knee extensor torque was obtained using an isokinetic dynometer. For the longitudinal analysis, a subset of 8 boys repeated these measures one year later and percent changes from baseline were calculated. Data were tested for normality using the Shapiro-Wilk test and relationships were examined using Pearson correlational analyses. Significance was set at 0.05.

Results

• LBM was significantly correlated with peak isometric knee extensor torque for the cross sectional analysis of 26 boys, r = 0.68, p =.0001 (Fig 1).

• Percent change in LBM was significantly correlated with percent change in isometric knee extensor torque after one year, r =.74, p =.04 (Fig 2).

References


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