Duchenne muscular dystrophy (DMD) is a progressive neuromuscular disease affecting 1 in 3,500 boys. Diffuse muscle weakness is caused by deficiency of the subsarcolemmal protein dystrophin—subsarcolemmal protein critical for multiple functions, including muscle cell membrane integrity and increasing blood flow to muscles during contraction via neuronal nitric oxide synthase (nNOS).

Risks of exercise must be considered to protect this population from potentially harmful effects, while recognizing potential beneficial aspects of activity to establish the ideal therapeutic balance.

The aim of this systematic review is to report on appropriate exercise/activity parameters. The lack of conclusive benefits and risks of exercise in a pediatric population with DMD. The purpose of this systematic review is to report on the effect of abnormal nNOS plus muscle fragility.

Seven selected articles report on changes in strength, function, imaging/biomarkers, and respiratory function after exercise.

Exercise Effect: 0/2 studies reported benefit in strength.

Function: 3/3 studies reported benefit in function.

Imaging/Biomarkers: 1/2 studies reported benefit via imaging/biomarkers.

Respiratory Function: 1/2 studies reported benefit in respiratory function.

Risk of exercise: 0/3 studies reported risk to function.

Respiratory Function: 1/2 studies reported risk in respiratory function.

• Continued caution for protection of this vulnerable population
• Safe and effective implementation of exercise/activity requires:
  ○ definition by type, dosage, and frequency
  ○ consideration of individual’s current disease status
• Evidence supports the use of low-intensity, assisted, and submaximal activity, while avoiding overexertion to best protect the vulnerable state of the muscle tissue, all systems contributing to exercise capacity, and each individual with DMD

Clinical Relevance:
• Further study is necessary to better recommend exercise and activity parameters in clinical practice
• Approval of actual disease-modifying drugs has begun for those with DMD, and will require additional study of potential changes in exercise capacity, and potential effects of exercise combined with anticipated and exciting increases in emerging treatments

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