

EXERCISE INCREASES UTROPHIN PROTEIN EXPRESSION IN THE MDX MOUSE MODEL OF DUCHENNE MUSCULAR DYSTROPHY

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Duchenne muscular dystrophy (DMD) is a lethal genetic disease affecting 1:3500 male births. Mutations in the dystrophin gene lead to the loss of a functional dystrophin protein causing extensive muscle damage thus reducing muscle function. Utrophin is a homologue to dystrophin, and its over expression in mdx mice significantly alleviates the disease pathology. PGC-1 alpha activation increases the expression of utrophin, and exercise increases PGC-1 alpha activity. Voluntary exercise in the mdx mouse model of DMD reduces muscle pathology and increases muscle function, but it is not known how this adaptation occurs. **Purpose:** Determine if voluntary wheel running exercise increases utrophin protein expression in the mdx mouse model of Duchenne muscular dystrophy. **Methods:** Mdx mice were randomized to either a control or voluntary wheel running exercise group. Measurements were made after 12 weeks of treatment. Total utrophin protein was measured in the quadriceps and soleus muscles by western blot. Total PGC-1 alpha protein content was measured in the quadriceps by western blot. **Results:** 12 weeks of voluntary wheel running increased total utrophin protein content in the quadriceps $334 \pm 63\%$ ($p < 0.05$) relative to the sedentary control group. Exercise did not affect total utrophin protein content in the soleus relative to the sedentary control group. Exercise did not affect total PGC-1 alpha protein content in the quadriceps relative to the sedentary control group. **Conclusion:** Voluntary aerobic exercise may be a viable therapeutic modality to increase utrophin protein content, decrease muscle pathology, and increase muscle function in dystrophic skeletal muscle.