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Effects of Reducing Fatigue in Muscular Dystrophy Through Physical Activity

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Background on Muscular Dystrophy
Myopathy is a functional impairment of muscle tissue; muscular dystrophy is a type of myopathy (Rakowicz & Lane, 2004). Muscular dystrophy (MD) consists of progressive muscle weakness and affects limbs and facial muscles. The most common types include Duchenne muscular dystrophy, Fascioscapulohumeral muscular dystrophy (FSHD), and Limb-girdle muscular dystrophy (Mercuri & Muntoni, 2013). One common complaint found with patients with muscular dystrophy is fatigue. It is noted that fatigue affects daily activities, but it is believed that physical activity can help reduce this. The purpose of this systematic review is to research how effective physical activity is at reducing fatigue in patients with muscular dystrophy.

Selection Criteria
Articles were searched between the years of 2004-2015 using the following:

Key Words: Physical activity, exercise, fatigue, muscular dystrophy, movement, exercise therapy, tired, muscular fatigue, fatigue treatment, myopathy, muscle degeneration, rehabilitation, treatment, daily function, daily activities

Inclusion Criteria:
• Identified fatigue in relation to muscular dystrophy
• Physical activity aided in the reduction of fatigue
• Level I evidence and Level II evidence.

Databases:
• ClinicalKey, ScienceDirect, Gale Group, Cochrane Review, PubMed, Google Scholar, Dynamed, Scopus, MedLine, ProQuest, ERIC

Table 1
Out of a total of 20 articles were reviewed, 7 met our inclusion criteria. (*4 RCT's, 2 Systematic Reviews, 1 Small N Design, and 1 Descriptive Study)

* 1 article contained 2 studies

Table 1, shown below, outlines the articles researched and its findings.

<table>
<thead>
<tr>
<th>Article</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both aerobic exercise and cognitive-behavioral therapy reduce chronic fatigue in FSHD (fascioscapulohumeral MD) (Voet et al. 2014)</td>
<td>Cognitive behavioral therapy and aerobic exercise therapy helped reduce fatigue after a 16 weeks of treatment</td>
</tr>
<tr>
<td>Efficiency of muscle exercise in patients with muscular dystrophy: A systematic review showing a missed opportunity to improve outcomes (Gianola et al. 2013)</td>
<td>Exercise may be useful, not useful, or detrimental. Further research is needed to investigate strength of muscles, fatigue and functional limitations</td>
</tr>
<tr>
<td>Experienced fatigue in facioscapulohumeral dystrophy, myotonic dystrophy, and HMSN I (hereditary motor and sensory neuropathy type I) (Kalkman et al. 2005)</td>
<td>In MD patients only physical functioning and social functioning were related to fatigue. Fatigue in relation to quality of life has not yet been studied.</td>
</tr>
<tr>
<td>Effects of training and albuterol on pain and fatigue in facioscapulohumeral muscular dystrophy (Kooi et al. 2007)</td>
<td>There is no positive or negative effect strength training and albuterol have on pain, experienced fatigue, functional status, and psychological distress.</td>
</tr>
<tr>
<td>Acute effects of different exercises on hemodynamic responses and fatigue in Duchenne muscular dystrophy (Alemdaroglu, Karaduman, &amp; Vilmaz, 2012)</td>
<td>Physiotherapy compared to other exercise techniques, may have a greater impact on patients with Duchenne muscular dystrophy.</td>
</tr>
<tr>
<td>Aerobic training in patients with myotonic dystrophy type 1 (Ormgreen, Visling, &amp; Olsen, 2005)</td>
<td>Aerobic training can help improve physical functioning of patients with myotonic muscular dystrophy</td>
</tr>
<tr>
<td>Strength training and aerobic exercise training for muscle disease (Review) (Voet et al. 2014)</td>
<td>In the FSHD training group, fatigue slightly decreased. In the non-training group, an increase in fatigue was noted.</td>
</tr>
</tbody>
</table>

Results
• There was no clear consensus to whether physical activity improves fatigue based on the varying results of the articles reviewed.
• Progression, type of dystrophy, and type of exercise affected the results of the articles
• Physical activity reduced fatigue among individuals with fascioscapulohumeral, Duchenne, and myotonic MD, but it is unclear whether these findings could be extended to those with other types of MD.

Implications
As a result, there were inadequate results based from the articles reviewed to confirm the role of physical activity in reducing fatigue. There are several types of muscular dystrophy, and each type responds differently to physical activity. Therefore, future research should target specific types of MD, or levels of physical functioning. These types of studies would help clinicians better target physical activity interventions to those clients who could benefit the most. Clearer measures for fatigue and fatigue severity are also needed.

References Available Upon Request