REHABILITATION OF POLYMYOSITIS – AN EVIDENCE BASED STUDY

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Abstract

Introduction: Muscle weakness can influence on physical functioning. Polymyositis, a rare condition where weakness and wasting of pelvic and shoulder girdle muscles can impair physical abilities leading to dependency and disabilities.

Aims and objectives of the study: was to evaluate the efficacy of graded functional re education on quality of life in a subject with Polymyositis.

Material and methodology: This study subject was diagnosed with proximal muscle weakness (pelvic and shoulder girdle muscles) and was treated with specific strengthening exercises during the period from 08/11/2016 to 10/09/2017, with weekly frequency of two and each session for 25-30 minutes. The results of pre and post Quality of life SF – 36 questionnaire (QOL) scores were statistically analysed.

Results: The subject has improved general and physical health and activities by 50%. Emotional health by 50%. Energy and emotional behaviour by 60% and social activities by 83%. The above results were obtained using SF-36 questionnaire before and after treatment in a subjective rating score on general, physical health, social activities, emotional health, energy and emotional behaviour on a 5 point scale.

Conclusion: The efficacy of specific exercises in polymyositis as major outcomes of this study can be validated among similar subjects with polymyositis for improving their Quality of life (QOL).

Introduction

The inflammatory myopathies are a heterogeneous group of diseases with the three major forms are: dermatomyositis (DM) and polymyositis (PM), both of which can occur in isolation or as part of a systemic connective tissue disease (overlap syndrome), and inclusion body myositis (IBM) (Mastalgia 2008). Polymyositis (PM) is characterized pathologically by the presence of inflammatory infiltrates in striated muscle, which is thus included in inflammatory myopathies disorders. With the current evidence also suggesting is an autoimmune disorder. PM can affect people of any age, but most commonly presents between the ages of 50 to 70, and is twice as common among females as males. The overall prevalence of PM is 1 per 100,000. Muscle weakness may develop suddenly or more insidiously over a period of weeks to months. The classic symptom of PM is proximal weakness, which may manifest as difficulty holding the arms over the head, climbing stairs, or rising from a chair. Weakness of the striated muscle of the upper esophagus may result in dysphagia, dysphonia, and aspiration. The chest wall muscles may be affected, leading to ventilatory compromises. Involvement of cardiac muscle may lead to arrhythmias and congestive heart failure.

The principal goals of therapy are to improve strength and improve physical functioning. With the long term rehabilitation the 5-year survival rate for treated patients is in the order of 95%. Up to one-third of PM patients may be left with some degree of residual muscle weakness. (Hunter et al 2012) Their main features are muscle weakness...
of variable degrees, elevated serum levels of skeletal muscle enzymes, altered electromyography patterns, evidence of inflammation in magnetic resonance images and histological changes suggestive of non suppurative inflammatory myositis (Rosa et al 2013). Polymyositis are rare conditions with reduced muscle function, general fatigue (Fathi M et al 2004).

**Key words**
Polymyositis, exercise, QOL, SF – 36 questionnaire, Irradiation, Closed Kinematic Exercise, Isometric Exercise.

**Aims and objectives**
This original case study was to evaluate the efficacy of functional re-education with physioball on this subject with polymyositis using SF – 36 questionnaire.

**Background information**
52 year old male with c/o difficulty in breathing, unable to walk was admitted and diagnosed with muscle biopsy, elevated ESR, and CPK for inflammatory myopathy. He gives a family history of elder sister with similar condition, was treated with T Wysolene for 8 years. Later developed obesity, hypertension and type II diabetes mellitus and getting treated with due medication. with no physiotherapy provided from 2007 - October 2016. Since November 2016 he is getting treated by the author with regular physiotherapy till today

**On Observation:** ambulance unaided for short distance with mild lumbar list

**Table: 1 On Examination: motor power**

<table>
<thead>
<tr>
<th>Muscles</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hip</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexor</td>
<td>3-</td>
<td>3</td>
</tr>
<tr>
<td>Extensor</td>
<td>2+</td>
<td>2</td>
</tr>
<tr>
<td>Abductors</td>
<td>3+</td>
<td>3</td>
</tr>
<tr>
<td>Adductor</td>
<td></td>
<td>3-</td>
</tr>
<tr>
<td><strong>Knee</strong></td>
<td></td>
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</tr>
<tr>
<td>Extensor</td>
<td>3-</td>
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<tr>
<td>Flexors</td>
<td>3</td>
<td>2+</td>
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<tr>
<td>Vastus lag</td>
<td>-ve</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Ankle</strong></td>
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<td></td>
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<tr>
<td>Dorsiflexors</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Plantar flexors</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spine</strong></td>
<td>II/V</td>
<td></td>
</tr>
<tr>
<td>Abdominal muscles</td>
<td>II/V</td>
<td></td>
</tr>
<tr>
<td><strong>Shoulders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexors</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Extensors</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Abduction</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Elbow</strong></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Hand</strong></td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>
Bed mobility: he is independent but transfers he is partially dependent with moderate support

ADL; most of the self care activities like toileting, bathing, he is dependent partially

Fatigue level; was recorded in both upper and lower extremity muscles and for mild exertional dyspnea. Exercise tolerance was found to be poor.

Materials And Methodology
This original case study was conducted in Chennai during the period from 08/11/2016 to 10/09/2017 the subject was treated with non invasive means using specific exercises of functional re education using Physioball with weekly frequency of two . Nature of exercises was closed kinematic exercises and isometric. Exercises were graduated progressed with heart rate for intensity. Supine, prone, sitting and side postures were adopted for exercises, an incentive spirometer was used to improve his vital capacity, Number of exercises: - 14 repetitions: - 4. Also irradiation of PNF were widely used. Quality of muscle contraction, heart rate, physical signs, with rest in between exercises were monitored for during therapy. Each session due stabilization of proximal bone to ensure proper muscle usage were done as the subject has developed adaptive trick movements to compensate normal muscle activity. Each session lasts for 20 to 25mins.

Results
The subject has improved general and physical health and activities by 50%. Emotional health by 50%. Energy and emotional behaviour by 60% and social activities by 83%. The above results were obtained using SF-36 questionnaire before and after treatment in a subjective rating score on general, physical health, social activities, emotional health, energy and emotional behaviour on a 5 point scale.

Discussion
• Muscle weakness is most prominent in proximal in patients with polymyositis (Harris Love et al 2009). In line with this report this study subject was found to have proximal muscle weakness of both shoulder girdle and pelvic girdle.
• A reduced grip strength by 50 % was reported (Regardt et al 2011 ), but this research subject had symmetrical very good hand grip strength.
• Aerobic capacity is low in these patients compared with healthy individuals (Wiesinger GF et al 2000) with low vital capacity the subjects endurance for physical activities was evident with increased breathing rate , heart rate and gets disphonic as recorded during exercise therapy session, hence rest periods in between were given.
• Patients with chronic polymyositis have limited sexual activity , walking, social activities , sleep in a self reported study ( Alerno Hunters et al 2011) in concurrence with this a lowered social activity was recorded in with this subject .
• The degree of activity limitation seemed to be associated to disease duration and higher glucocorticoids doses (Clark et al 1995), and this goes well with this study subject of 20 years with polymyositis and was treated with steroid medication later developed obesity and became diabetic and hypertensive, for which he is medically treated 2 years since.
• Reduced Quality of life (QOL) is reported in patients with polymyositis (Sultan et al 2002) which has recorded in this subject with chronic polymyositis with diminished quality of life and increased dependency for daily routines.
• 12 week resistance exercises programme of weekly 5 sessions have improved by 17 percentages in endurance with activity, without signs of increased inflammation in serum, muscle biopsies (Alexanderson H et al 1999).
• 11 patients with recent onset of polymyositis have an improved perceived health and repetitive muscle function by 18% without signs of increased inflammation (Alexanderson H et al 2000)
• (Wiesinger GF et al 2000) among 13 subjects with chronic polymyositis in 24 weeks 60% VO₂ max have an improved isometric muscle strength and improved physical activities .
• Physical therapy to be started early in the disease to preserve existing muscle function avoid disuse atrophy of the muscle weakness and prevent joint contractures ( Marihos Dalakas 2008) , poor prognosis of this subject
could be only from November 2016, he was getting treated with regular physiotherapy, and from 2007-October 2016 no physical therapy was provided.

Critical analysis of this study
1. Only functional Index on QOL was analysed
2. No EMG, NCV, specific muscle related therapeutic prognosis was made.
3. The study was case discussion nature, limited follow up and of short duration, however can be validated with more measureable variables to be analysed and more physio therapeutic modalities could be used as further continuation of this research.
4. This study subject was diagnosed based on muscle biopsy with inflammatory myopathy and elevated ESR and CPK levels.
5. As polymyositis should not have positive family history of neuromuscular disease, a concurrent endocrine disease (Dalakas et al 2003)
6. This subject elder sister has inflammatory myopathy which required further investigations to confirm the diagnosis.

Limitations
Limitation of this case study was case design with no control group of short duration follow up, hence further studies with more evaluating tools such as CPK, ESR, muscle biopsy among larger sample size and comparison with other physical modalities could be continued as extension of this original study.

Conclusion
This study subject with weakness of shoulder and pelvic girdle requires long term rehabilitation and follow-up. With nearly a year of treatment by the author with resisted means of exercises using physioball, irradiation techniques, functional re education a reasonable prognosis was recorded in terms of muscle power, endurance, vital capacity and few functional activities.

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