The Myositis Association
Hand exercise in myositis

Malin Regardt
Occupational Therapist and PhD
Karolinska University Hospital
Karolinska Institutet
Stockholm Sweden
Todays session

- How hand function is affected in different subtypes of myositis
- Results from two studies
- Examples of hand exercise
Differences in hand function in subtypes of myositis

- Polymyositis and Dermatomyositis
  - Reduced grip strength
    - Present in the late phase of the disease
    - Reduced already in the beginning of the disease
    - Women had approximately 71% and men 60%
    - Associated to domestic activities and Quality of Life

- Inclusion Body Myositis
  - Reduced strength in finger flexors → reduced ability to move fingers
    - Reduced dexterity
    - Women had approximately 42% and men 30%
    - Associated to daily activities and Quality of Life
Hand exercise intervention in PM and DM

- To develop a 12-week hand exercise intervention for persons with PM and DM and evaluate
  - Adherence
  - Participants opinion of programme design and overall feasibility
  - Effect on hand function and activity limitation after the intervention
### Outline of the study

<table>
<thead>
<tr>
<th>Baseline measure</th>
<th>12 week hand exercise intervention</th>
<th>Follow-up measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exercise 3 times/week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diary</td>
<td></td>
</tr>
<tr>
<td>week 1-4</td>
<td>week 5-8</td>
<td>week 9-12</td>
</tr>
<tr>
<td>5§ or 10§§ rep.</td>
<td>10§ or 20§§ rep.</td>
<td>15§ or 30§§ rep.</td>
</tr>
</tbody>
</table>

#### 0 weeks

**Measure:**
- **Hand function**
- **Activity limitation**
- **Disease activity**

#### 12 weeks

**Measure:**
- **Hand function**
- **Activity limitation**
- **Disease activity**

<table>
<thead>
<tr>
<th>Exercise 3 times/week</th>
<th>Diary</th>
</tr>
</thead>
</table>
| §
| key pinch grip        | (press thumb against the radial side of the proximal interphalangeal joint of the index finger) |
| three jaw pinch grip  | (press thumb tip against tip of index and middle finger) |
| thumb opposition       | (press thumb towards the base of the little finger) |
| finger abduction       | (spread the fingers two by two with the putty as a resistive circle around the fingers) |
| finger adduction       | (press the fingers together two by two with the putty between the fingers) |
| §§                     |       |
| finger flexion         | (squeeze the putty with all fingers) |
| finger extension       | (extend the fingers with the putty as a resistive circle around the fingers) |
| finger opposition      | (press the thumb against the fingertips, one at the time through the putty). |
This is the hand exercise program that was used in the study for people with PM or DM. After input from participants two of the exercises were deleted because they were too difficult to perform.
Evaluation of hand exercise in PM and DM

- 11 participants with PM or DM were included in the study

- Adherence was good (78-100%) (acceptable adherence was ≥75% (≥ 27 sessions).

- 30 repetitions were too many and the program were too time consuming
  - Participants suggested 10-20 repetitions 2-4 days/week

- On a group level the three-jaw pinch-grip strength had increased (left hand)

- There were some individual improvement in hand function and activities
Conclusion

A hand exercise programme seems to be feasible to use in persons with PM and DM, but the design of the programme needs to be further evaluated to offer improvements in hand function and activity performance.
Hand exercise intervention in IBM

- Needed to use another methodology
  - Single subject design - participants act as their own control
    - Less number of participants are needed
    - Information about the exercise effect before and during the intervention
    - Each participant is their own control.
  - Two consecutive values that exceed the baseline (A-Phase) measures during the exercise period (B-Phase) is a “true” improvement

<table>
<thead>
<tr>
<th>A-Phase 5 weeks</th>
<th>B-Phase 12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline assessments</td>
<td>Exercise assessments every other week</td>
</tr>
<tr>
<td>Hand Exercise 5 days/week in 12 weeks. The participants were offered to exercise at the hospital once/week.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Week 1</th>
<th>Week 3</th>
<th>Week 5</th>
<th>Week 7</th>
<th>Week 9</th>
<th>Week 11</th>
<th>Week 13</th>
<th>Week 15</th>
<th>Week 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
<td>Grip strength</td>
</tr>
<tr>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
<td>Pinch grip</td>
</tr>
</tbody>
</table>
This is the hand exercise programs that were used in the study for people in IBM. Both mobility and strengthening exercise was performed.
Evaluation of hand exercise in IBM

- 9 participants with IBM were included in the study
- Examples of the results
  - Improvements in key and three jaw pinch grip strength

Key pinch grip strength left hand

Three jaw pinch grip strength right hand

Malin Regardt, TMA Conference, Minneapolis September 2019
Evaluation of hand exercise in IBM

- Few improvement regarding hand function (grip strength and pinch grip strength)
- No one got worse indicating that it is safe to do hand exercise
- In retrospect there are space for improvement in the method

- The participants were asked to name activity areas they wanted to improve
  - Six of nine participants improved in there performance or satisfaction in their hand related activities
  - Indicating the need to also include training in activities.
Hand exercise

- Important to do both mobility exercise and strength exercise
  - In polymyositis and dermatomyositis we have not seen so much limitation in joints, but it is important to check
    - Perform mobility exercise ones a week
    - Perform strengthening exercise ones a day
  - In inclusion body myositis limitation in joint mobility may occur due to muscle weakness
    - Important to both passively and actively exercise joint mobility
    - Perform mobility and strengthening exercise ones a day
Mobility exercise

1) Lift your wrist, hold.
   Repeat 5-10 times

2) Flex the finger joints
   Repeat 5-10 times

3) Flex the finger joints
   Repeat 5-10 times

4) Make a fist
   Repeat 5-10 times

Malin Regardt, TMA Conference, Minneapolis September 2019
Mobility exercise

5) Make a circle with the thumb and the index finger
   Repeat 5-10 times

6) Move the thumb up in a wide circle
   Repeat 5-10 times
Strengthening exercise

- Chose a ball or a dough that gives enough resistance
- After performing the whole program the perceived exertion according to Borg should be on at least “somewhat hard” (4) or “hard” level (5)
- It is important that you can flex the joints in the ball or dough
- DO NOT overstretch the joints

Borg scale of exertion

<table>
<thead>
<tr>
<th>Rating</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Rest</td>
</tr>
<tr>
<td>1</td>
<td>Very, Very Easy</td>
</tr>
<tr>
<td>2</td>
<td>Very Easy</td>
</tr>
<tr>
<td>3</td>
<td>Easy</td>
</tr>
<tr>
<td>4</td>
<td>Moderate</td>
</tr>
<tr>
<td>5</td>
<td>Somewhat Hard</td>
</tr>
<tr>
<td>6</td>
<td>Hard</td>
</tr>
<tr>
<td>7</td>
<td>Very Hard</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Maximal</td>
</tr>
</tbody>
</table>

Malin Regardt, TMA Conference, Minneapolis September 2019
Strengthening exercise

1) Squeeze the ball or the dough, flexing all fingers and thumb
   Repeat 10-15 times

2) Press the thumb towards the fingers one at the time and try to make circles
   Repeat 5-10 times

Malin Regardt, TMA Conference, Minneapolis September 2019
Strengthening exercise

3) Press the thumb while holding the ball or dough (key grip)
   Repeat 10-15 times

4) Press the thumb towards the index and middle finger through the ball or the dough
   Repeat 10-15 times
5) Press the thumb through the ball or dough towards the base of the little finger
Repeat 10-15 times
Hand exercise

- Seems to be safe to do hand exercise
- Studies have showed some individual improvements
- No one in the studies decreased in hand function
- Better studies are needed

- Even though the improvements were limited in hand function the ability to do activities improved
  - Indicating that activity training may be useful as a complement