Experienced fatigue, pain and instability during sitting in persons with chronic SCI

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Introduction

Wheelchair bound persons with a chronic SCI:
- Are in the wheelchair for about 13 hours a day
- Have less opportunities to change seating position
- Do all their activities while seated

Seating comfortable and stable is a prerequisite for optimal daily functioning.

Research questions

1. How do persons with a spinal cord injury experience comfort during sitting?
   a) Fatigue
   b) Pain
   c) Location of pain

2. How much stability is experienced during
   a) "normal" seating?
   b) reaching e.g. for a bottle (paraplegia) or a cup (tetraplegia)?
### Research questions

3. Do people lack support in their wheelchair?
   a) where exactly?
   b) Is fatigue related to lack of support?

4. Are people satisfied with their sitting posture?
   a) and can it be improved?
   b) Is satisfaction related to lack of support?

### Methods

- A cross-sectional study using a self-report questionnaire

- **Subjects:** ALLRISC-dataset (N=265):
  - who use a wheelchair for daily mobility
  - TSI: ≥10 years
  - Age: >18 year when SCI was diagnosed; at time of questionnaire: 28-65 years

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### Results

#### 1a) Is seating fatiguing?

- **N=265**

<table>
<thead>
<tr>
<th>Fatigue Level</th>
<th>Never</th>
<th>Sometimes</th>
<th>Regularly-always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16%</td>
<td>51%</td>
<td>33%</td>
</tr>
</tbody>
</table>

No sign. difference between PP and TP in occurrence of fatigue

#### 1b) Is seating painful?

- **N=265**

<table>
<thead>
<tr>
<th>Pain Level</th>
<th>Never</th>
<th>Sometimes</th>
<th>Regularly-always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30%</td>
<td>42%</td>
<td>28%</td>
</tr>
</tbody>
</table>

No sign. difference between PP and TP in occurrence of pain

#### 1c) Location and severity of pain?

<table>
<thead>
<tr>
<th>Location</th>
<th>No pain</th>
<th>Not - little severe</th>
<th>1-2</th>
<th>Moderately - very severe</th>
<th>3-4-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>32%</td>
<td>50%</td>
<td>18%</td>
<td>(14-3-1)</td>
<td></td>
</tr>
<tr>
<td>Back at shoulder height</td>
<td>26%</td>
<td>48%</td>
<td>27%</td>
<td>(18-7-2)</td>
<td></td>
</tr>
<tr>
<td>Lower back</td>
<td>32%</td>
<td>41%</td>
<td>28%</td>
<td>(13-9-6)</td>
<td></td>
</tr>
<tr>
<td>Side thorax</td>
<td>68%</td>
<td>27%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side lower back</td>
<td>59%</td>
<td>34%</td>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischial tuberositas</td>
<td>45%</td>
<td>39%</td>
<td>16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coccyx</td>
<td>54%</td>
<td>36%</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2a) Experiencing stability during normal seating?

- **Stability**
  - Reasonably stable: 37%
  - Stability: 55%
  - No stability: 9%

Differences in TSI, age, lesion level between groups:

- Older than
- Tendency of more TP in and
2b) Experiencing stability during reaching?

- Falling forwards: 21%
- Falling sideways: 9%
- Falling forwards and sideways combined: 30%
- Stability: 67%

i.w Alm (2003): Falling sideways and forwards are problems!

Especially in TP

3a) Is support lacking in your wheelchair?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
<th>I don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraplegia</td>
<td>68%</td>
<td>21%</td>
<td>11%</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>74%</td>
<td>15%</td>
<td>11%</td>
</tr>
</tbody>
</table>

3b) At which location is support lacking?

<table>
<thead>
<tr>
<th>Location</th>
<th>Paraplegia (N=23 out of 157)</th>
<th>Tetraplegia (N=24 out of 107)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral to chest</td>
<td>0</td>
<td>10 persons</td>
</tr>
<tr>
<td>Back at shoulder level</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Lower back</td>
<td>12 persons</td>
<td>7</td>
</tr>
<tr>
<td>Lower lower back</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Buttocks</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Is fatigue related to experienced (lack of) support in the wheelchair?

- Lacking support-group (n=47)
  - Fatigue:
    - No: 15%
    - Sometimes: 43%
    - Regularly: 28%
    - Often: 13%
    - Always: 3%

- Not lacking support-group (n=188)
  - Fatigue:
    - No: 20%
    - Sometimes: 52%
    - Regularly: 15%
    - Often: 11%
    - Always: 2%

Satisfaction with seating in SCI

- N=265
- Yes: 58%
- Reasonably: 28%
- No: 14%

*Alm (2003): Only 43% (n=30) satisfied
Samuelsson (2004): 48% good nor bad, 13% bad

Can seating be improved?

- Yes: 48%
- I don’t know: 24%
- No: 28%

Is satisfaction related to (lack of) support in the wheelchair?

- Lacking support-group (n=47)
  - Satisfaction:
    - Very satisfied: 13%
    - Satisfied: 43%
    - Reasonably: 28%
    - Not satisfied: 15%
    - Not satisfied at all: 3%

- Not lacking support-group (n=188)
  - Satisfaction:
    - Very satisfied: 3%
    - Satisfied: 20%
    - Reasonably: 52%
    - Not satisfied: 15%
    - Not satisfied at all: 11%
Discussion

- Are fatigue and pain and instability related to the wheelchair?
- Preliminary result: fatigue, pain and dissatisfaction seem to be more prominent in the group that lacks support in the wheelchair.
- We do not know if support is objectively lacking in the wheelchair!

Evidence for more support

Alm et al.* (2003):
- Both the examiner’s classification and the subjects’ reports showed the need for a better postural alignment
- Current wheelchair specifications and adjustments seem to:
  - inhibit a postural correction towards upright sitting
  - fail to provide sufficient lateral support

Clinical Relevance

Do wheelchairs always offer enough lateral trunk and back support?

Conclusions

- Persons with SCI frequently report fatigue, pain and instability during sitting.
- A majority believes their own sitting posture can be improved:
  - More support may be needed in the wheelchair in those who lack support
  - Persons with SCI should be advised to have their sitting posture regularly checked, preferably by SCI-specialized seating therapists/Seating Advisory Team.

Intervention

Offering more support

Seating Advisory Team

before

after

Support
Thank you for your attention

Are the ones that lack support in a certain location (e.g. lower back) also the ones that have pain in logical locations such as neck and lower back?

For example: kyphotic posture

N=19 who lack support in lower back: 12 have moderate to severe pain in lower back (reported 10 times) and/or back at shoulder height (7) and/or neck (5)