A Qualitative Investigation for Symptomatic Patients after Anterior Cruciate Ligament Reconstruction

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I have no financial conflicts to disclose.
Primary anterior cruciate ligament reconstruction (ACLR) is known to have excellent outcomes, but many patients still have symptoms on the operated knee even after return to sport (RTS).

Purpose
To investigate the properties of the patient who are symptomatic after RTS.

Hypothesis
Symptomatic patients show poor result in physical and psychological tests.
Material and Method

- ACLR Feb. 2015 to Oct. 2016, 40 cases (40 knees)
- All patients could RTS
- After RTS, task battery and clinical outcomes were measured.
- Task battery was performed before and right after agility test. (normal and fatigue condition)
- Divided into symptomatic group and asymptomatic group.
- Task battery was expressed as a LSI (involved limb/uninvolved limb × 100 %).
- Student’s t-tests, with $p < 0.05$ considered statistically significant.
Task battery

Postural stability

Jump test; hop for distance

Agility test; Multiple speed chase

Isokinetic muscle strength; extension, flexion
Result: Clinical outcomes and Demographic data

<table>
<thead>
<tr>
<th>Symptom Type</th>
<th>n</th>
<th>Age (year)</th>
<th>BMI</th>
<th>Time post-surgery</th>
<th>Lysholm</th>
<th>Beighton</th>
<th>ACL-RSI</th>
<th>Tegner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic</td>
<td>15</td>
<td>27.3±7.2</td>
<td>24.4±1.6</td>
<td>301±153</td>
<td>94.9±5.3</td>
<td>4.0±1.9</td>
<td>62.2±18.4</td>
<td>8.5±0.8</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>25</td>
<td>23.9±6.2</td>
<td>23.4±2.0</td>
<td>259±83</td>
<td>98.0±2.8</td>
<td>4.2±2.2</td>
<td>81.6±11.0</td>
<td>8.8±1.2</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>25.1±6.2</td>
<td>23.7±1.9</td>
<td>275±114</td>
<td>96.9±4.2</td>
<td>4.1±2.1</td>
<td>74.3±17.1</td>
<td>8.7±1.0</td>
</tr>
<tr>
<td>p value</td>
<td></td>
<td>0.10</td>
<td>0.13</td>
<td>0.26</td>
<td>0.02</td>
<td>0.78</td>
<td>0.0002</td>
<td>0.37</td>
</tr>
</tbody>
</table>

15 patients had 20 symptoms.

Lysholm score and ACL-RSI score were significantly lower in symptomatic group.
Result: Task battery

<table>
<thead>
<tr>
<th>Symptomatic (N = 15)</th>
<th>Asymptomatic (N = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injured leg</td>
</tr>
<tr>
<td>Postural instability (s)</td>
<td>2,66 ± 0,85</td>
</tr>
<tr>
<td>Hop for distance (cm)</td>
<td>182,5 ± 24,1</td>
</tr>
<tr>
<td>Hop for distance, fatigue (cm)</td>
<td>182,1 ± 27,7</td>
</tr>
<tr>
<td>Multiple speed chase (ms)</td>
<td>353,2 ± 103,0</td>
</tr>
<tr>
<td>Multiple speed chase, fatigue (ms)</td>
<td>403,9 ± 169,3</td>
</tr>
<tr>
<td>Isokinetic muscle strength ex (deg/sec)</td>
<td>122,1 ± 28,3</td>
</tr>
<tr>
<td>Isokinetic muscle strength flex (deg/sec)</td>
<td>96,2 ± 20,0</td>
</tr>
</tbody>
</table>

There were no significant difference in the Task battery between 2 groups.
Discussion: Task battery

- A task battery with functional tests was developed for decision-making with regard to RTS following ACLR. LSI > 90% is considered as a criteria. (Gokeler et al. KSSTA 2017)
- As far as we are aware, no task battery were measured under fatigue condition.
- Contrary to our expectations, patients who could RTS recovered physically, even if they have symptoms on the operated leg.
- No influence was caused by fatigue condition.
Discussion: ACL-RSI

- ACL-RSI was used to measure psychological readiness to return to sports. (Webster AJSM 2018, Tjong AJSM 2014)

- For the ACL-RSI, a cut-off score of 56 points at 4 months post-ACLR predicted RTS at 12 months with a sensitivity of 58 % and specificity of 83 %. (Ardern AJSM 2013)

In this study, ACL-RSI and Lysholm score were significantly higher in asymptomatic group than in symptomatic group, which implies that even if patients are physically recovered, they are not psychologically ready to RTS.
Limitations

• The task battery and clinical score were not measured preoperatively.

• The number of patients is not large and follow up period is short.
Conclusion

- Task battery and patient-reported outcome were measured after RTS in ACLR patients.
- Out of 40, 15 patients were symptomatic on the operated leg.
- ACL-RSI and Lysholm score were significantly higher in asymptomatic group than symptomatic group.
- No significant difference were measured in task battery.
Reference

- A. Gokeler et al. KSSTA 2017 Development of a test battery to enhance safe return to sports after anterior cruciate ligament reconstruction
- K. Webster et al. AJSM 2018 Factors Associated With Psychological Readiness to Return to Sport After Anterior Cruciate Ligament Reconstruction Surgery
- C. Ardern et al. AJSM 2013 Psychological responses matter in returning to preinjury level of sport after anterior cruciate ligament reconstruction surgery
- N. Lefevre et al. AJSM 2016 Return to Sport After Primary and Revision Anterior Cruciate Ligament Reconstruction
- V. Tjong et al. AJSM 2014 A Qualitative Investigation of the Decision to Return to Sport After Anterior Cruciate Ligament Reconstruction