Author’s response to reviews

Title: A Diagnostic Support Tool for Lumbar Spinal Stenosis - A self-administered, self-reported history questionnaire

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Author’s response to reviews: see over
OUR RESPONSES TO THE COMMENTS BY REVIEWERS

TO REVIEWR 1:

REVIEWR 1: The study is large, well designed and of clinical interest.

RESPONSE: We thank the reviewer for evaluating our manuscript. The following text describes our responses to the comments made by reviewer 1.

Major Compulsory Revisions

REVIEWR 1: A more detailed description of results from the physical examination with OR, CI and p-values and more detailed descriptions of the patient samples are informative.

RESPONSE: We agree with the point raised. We revised table 1, 2, 3, 4, and 5 with a more detailed description. OR, CI and p-values have changed due to our technical error in Table 4 and 5.

REVIEWR 1: Why was logistic regression and multivariate models not used?

RESPONSE: We agree with the point raised. Based on the results of this paper, we are planning to use logistic regression and multivariate models in the next project. Since we did not include patients without LSS in the derivation study 2, we could not use logistic regression and multivariate models. We have just finished the prospective derivation study 3 to present logistic regression and multivariate models (Table A). But we would like to present multivariate models next paper.

Table. A

<table>
<thead>
<tr>
<th>Symptom +</th>
<th>Symptom -</th>
<th>( \beta )</th>
<th>( p )</th>
<th>OR</th>
<th>95%CI</th>
<th>( \hat{\beta} )</th>
<th>( p )</th>
<th>OddsRatio</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbness and/or pain in the thighs down to the calves and shins</td>
<td>LSS +</td>
<td>101</td>
<td>92.7%</td>
<td>8</td>
<td>7.3%</td>
<td>-0.229</td>
<td>0.7404</td>
<td>0.7050</td>
<td>0.2050</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>158</td>
<td>65.9%</td>
<td>79</td>
<td>33.1%</td>
<td>2.8937</td>
<td>&lt;0.0001</td>
<td>18.1320</td>
<td>4.4850</td>
</tr>
<tr>
<td>Numbness and/or pain increase in intensity after walking for a while, but are relieved by taking a rest</td>
<td>LSS +</td>
<td>104</td>
<td>95.4%</td>
<td>5</td>
<td>4.6%</td>
<td>2.1678</td>
<td>0.0006</td>
<td>6.7990</td>
<td>2.4940</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>131</td>
<td>55.5%</td>
<td>106</td>
<td>44.5%</td>
<td>0.3565</td>
<td>0.0432</td>
<td>2.3080</td>
<td>1.0280</td>
</tr>
<tr>
<td>Numbness and/or pain are reduced by bending forward</td>
<td>LSS +</td>
<td>71</td>
<td>95.1%</td>
<td>38</td>
<td>34.9%</td>
<td>0.0772</td>
<td>0.0000</td>
<td>2.3080</td>
<td>0.0530</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>45</td>
<td>19.1%</td>
<td>101</td>
<td>80.9%</td>
<td>1.0117</td>
<td>0.0004</td>
<td>5.0120</td>
<td>2.0470</td>
</tr>
<tr>
<td>Numbness is present, but pain is absent</td>
<td>LSS +</td>
<td>35</td>
<td>32.1%</td>
<td>74</td>
<td>67.9%</td>
<td>0.6864</td>
<td>0.3371</td>
<td>0.0707</td>
<td>0.9016</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>45</td>
<td>19.1%</td>
<td>101</td>
<td>80.9%</td>
<td>1.7089</td>
<td>0.0002</td>
<td>5.5280</td>
<td>2.2310</td>
</tr>
<tr>
<td>Numbness is present in both legs</td>
<td>LSS +</td>
<td>82</td>
<td>75.3%</td>
<td>27</td>
<td>24.8%</td>
<td>0.6864</td>
<td>0.3371</td>
<td>0.0707</td>
<td>0.9016</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>52</td>
<td>22.5%</td>
<td>104</td>
<td>77.5%</td>
<td>1.0117</td>
<td>0.0004</td>
<td>5.0120</td>
<td>2.0470</td>
</tr>
<tr>
<td>Numbness is present in the soles of both feet</td>
<td>LSS +</td>
<td>70</td>
<td>64.2%</td>
<td>39</td>
<td>35.8%</td>
<td>1.5216</td>
<td>0.0003</td>
<td>4.5790</td>
<td>2.0050</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>45</td>
<td>19.1%</td>
<td>101</td>
<td>80.9%</td>
<td>0.6864</td>
<td>0.3371</td>
<td>0.0707</td>
<td>0.9016</td>
</tr>
<tr>
<td>A burning sensation arises around the buttocks</td>
<td>LSS +</td>
<td>25</td>
<td>22.9%</td>
<td>84</td>
<td>77.1%</td>
<td>0.7007</td>
<td>0.0016</td>
<td>1.0730</td>
<td>0.3500</td>
</tr>
<tr>
<td></td>
<td>LSS -</td>
<td>12</td>
<td>5.1%</td>
<td>224</td>
<td>94.9%</td>
<td>0.6864</td>
<td>0.3371</td>
<td>0.0707</td>
<td>0.9016</td>
</tr>
<tr>
<td>Walking nearly causes urination</td>
<td>LSS +</td>
<td>21</td>
<td>10.3%</td>
<td>88</td>
<td>89.7%</td>
<td>0.6864</td>
<td>0.3371</td>
<td>0.0707</td>
<td>0.9016</td>
</tr>
</tbody>
</table>

REVIEWR 1: Most page 10-11 should be described in the methods section.

RESPONSE: We agree to the point raised. We mentioned most page 10-11 in the methods.
REVIEWR 1: Please give the number of patients in tables 4 and 5
RESPONSE: We agree to this point. We revised tables 4 and 5.

REVIEWR 1: Please replace figure 4 with an Altman agreement plot.
RESPONSE: We agree to this point. We added more 108 patients for test-retest analysis. We replaced figure 4 with an Altman agreement plot in 217 patients.

Minor Essential Revisions
REVIEWR 1: Cauda equina syndrome is used for a spinal disorder that requires urgent surgery. The author should probably describe that the cauda equina type spinal stenosis is distinct from the cauda equina syndrome?
RESPONSE: We agree to this point. We added the following sentence to the introduction section.
The cauda equina type spinal stenosis is distinct from the cauda equina syndrome. A full blown cauda equina syndrome occurs in rare instances in the cauda equina type spinal stenosis. Therefore, urgent surgery is not required in the cauda equina type spinal stenosis.

TO REVIEWR 2:
We thank the reviewer for evaluating our manuscript. The following text describes our responses to the comments made by reviewer 2.

Major Compulsory Revisions
REVIEWR 2: The manuscript contains insufficient information to judge its value. It would be very helpful if the authors revised the manuscript and provided all the information requested in the STARD checklist. At the moment the majority of items from the STARD checklist are inadequately addressed. As an illustration the authors do not describe the study population, inclusion and exclusion criteria or participant sampling.
RESPONSE: We agree with the point raised. We revised the manuscript and provided all the information requested in the STARD checklist. We revised all tables (1 – 5) with a more detailed description. OR, CI and p-values have changed due to our technical error in Table 4 and 5.

REVIEWR 2: Of the issues above the critical issue for me is that the manuscript provides no information on the criteria used by the investigators to diagnose LSS. I accept the authors’ view that LSS is essentially a clinical diagnosis, and I agree that the consensus classification of a
A group of experts can be used as a reference standard in a diagnosis study. But for the study to be interpretable the authors need to provide an outline of the clinical features that the experts used to confirm that a subject did, or did not, have LSS.

RESPONSE: We agree with the point raised. We provided an outline of the clinical features that the experts used to confirm that a subject did, or did not, have LSS.

REVIEWR 2: The authors have published a related study in European Journal of Pain. I think it would be useful to compare the results of the two studies in the discussion. There is also a systemic review on the diagnosis of LSS published in Spine in 2006 and again I think the authors need to discuss this review. At the moment the manuscript is not provided with an appropriate context.

RESPONSE: We agree with the point raised. We compared the results of the two studies in the discussion. Also, we discussed the systematic review on the diagnosis of LSS published in Spine in 2006.

REVIEWR 2: Needs some language corrections before being published

RESPONSE: Native check for language corrections was performed.