Straight leg raising was a sensitive sign of lumbar disc herniation while crossed straight leg raising was a specific sign

Clinical Problem: A 36 year-old man comes to your office with a complaint of lower back pain. This began after helping his friend move to a new apartment and includes a component of shooting pain down the back of his left leg to the lateral aspect of his foot. Before making any decisions about treatment or the need for further investigation or referral, you carry out a focused history and physical examination.

Clinical Question: How predictive is the history and physical examination of a patient presenting with low back pain and “sciatica” in the diagnosis of causative disc herniation? What particular elements of the clinical examination are most useful in this regard?

Literature Search: PubMed: "sciatica"[MESH] AND "physical examination"[MESH]

Clinical Bottom Lines:

1. Straight leg raising has a sensitivity of 91% (95% CI = 0.78-0.97) vs the gold standard of operative findings of disc herniation. However, its specificity is only 32% (0.17-0.52) in this situation. Therefore, it is useful in “ruling out” disc herniation when it is absent.
2. If present, crossed straight leg raising is specific (98%, 0.94-0.99) for disc herniation, but is not very sensitive (32%, 0.16-0.54). Therefore, it is useful to confirm (“rule in”) disc herniation, but its absence is not meaningful.
3. Other historical and physical findings that may suggest disc herniation have not been studied adequately to provide a pooled estimate of their predictive values.
4. A combination of findings may be most useful in diagnosing disc herniation. There are no consistent results indicating the predictive properties of specific combinations.

The Evidence:
A systematic review of the available evidence on the value of history and physical examination findings in the diagnosis of disc herniation. A thorough literature search followed by abstract review revealed 37 studies. These were independently assessed by three investigators and rated for methodological quality on a 9-point scale. However, this rating did not seem to be incorporated into any subsequent meta-analysis. Pooled results for straight leg raising (SLR) and crossed SLR were calculated as these were the only tests with three or more studies reporting on their value. Otherwise, predictive properties of the other tests for disc herniation were tabulated simply as abstracted from those studies with reasonable rating scores, without further analysis.

Data:

<table>
<thead>
<tr>
<th>Test</th>
<th>Gold Standard</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>LR +</th>
<th>LR-</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLR</td>
<td>Non-Operative</td>
<td>0.85 (0.38,0.98)</td>
<td>0.52 (0.26,0.76)</td>
<td>1.77 (0.51,4.08)</td>
<td>0.29 (0.03,2.38)</td>
</tr>
<tr>
<td></td>
<td>95% CI 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLR</td>
<td>Operative</td>
<td>0.91 (0.78,0.97)</td>
<td>0.32 (0.17,0.52)</td>
<td>1.34 (0.94,2.02)</td>
<td>0.28 (0.06,1.29)</td>
</tr>
<tr>
<td>Crossed SLR</td>
<td>Operative</td>
<td>0.32 (0.16,0.54)</td>
<td>0.98 (0.94,0.99)</td>
<td>16 (2.67,54.0)</td>
<td>0.69 (0.48,0.89)</td>
</tr>
</tbody>
</table>

Comments:
1. This was the only systematic review of the literature examining clinical diagnosis of disc herniation specifically. Another review (reference #2) examines low back pain in general, and does comment on “radiculopathy,” without any formal meta-analyses of diagnostic test accuracy.
2. The methodological assessment of individual studies covered the main criteria that should be evaluated in assessing the quality of papers commenting on diagnostic tests.
3. All the studies found were carried out in selected populations, either in secondary or tertiary care settings. Many were among surgical candidates and so may not represent adequately the full spectrum of the disease in question (i.e.
disc herniation). The overall prevalence of the disease was high in all studies (often over 50%).
4. Many studies were not prospective and included only patients with known disc herniation. Therefore inflating the estimates of accuracy of various physical signs.
5. The gold standard used was either operative findings or imaging (MRI, CT, myelography).
6. The sensitivity (46-99%) and specificity (6-84%) of pain distribution varied widely among the three studies reporting on it.
7. The presence of sensory symptoms, reported in only one study, actually reduced the post-test probability of disc herniation, with a positive likelihood ratio of less than one.
8. Depressed reflexes seemed to be insensitive for disc herniation (from 4 to 54%) but somewhat more specific (60-92%) as might be expected. Similar findings were reported for muscle weakness and atrophy. However, not enough studies reported on any of these findings to allow pooling or meta-analysis.
9. Some of the variability among results for the same test may arise from lack of standardization for what constitutes a positive or negative test result; reproducibility of test results was rarely commented on.

Reference:

Key Words: back pain / lumbar disc disease / diagnosis

Appraiser: Raj Dhar and the UWO Evidence Based Neurology Group

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