Pain provocation tests for diagnosis of sacroiliac joint pain

Description

There are many tests devised to provide information about sacroiliac joint (SIJ) pain and function. Only pain provocation SIJ tests have been shown to have satisfactory inter-examiner reliability and validity with respect to a meaningful reference standard. These tests apply stress to the SIJ to determine if the usual pain is produced or aggravated and have been described in the orthopaedic medicine literature over many decades. Cyriax (1975) was probably the first author to include some in a comprehensive examination schema. Although not all provocation SIJ tests have been subjected to good quality reliability and validity research, the distraction, thigh thrust, Gaenslen’s, compression, sacral thrust, and Patrick’s tests are fully described (Kokmeyer et al 2002, Laslett et al 2003) and good clinimetric data are available.

The tests take less than five minutes to carry out. Some training is needed to ensure correct application of sufficient force to adequately stress the SIJs. By definition these tests cannot provoke usual pain in asymptomatic patients.

Inter-examiner reliability ranges from kappa = 0.26 to 0.82 for each individual test (Laslett & Williams 1994, van der Wurff et al 2000a). A multitest regimen of three or more positive tests is more reliable than individual tests with kappa = 0.70 (95% CI 0.45 to 0.95) (Kokmeyer et al 2002).

Validity In relation to the reference standard of controlled fluoroscopically guided anaesthetic block arthrography, sensitivity ranges from 0.50 to 0.88, and specificity from 0.69 to 0.81 (Laslett et al 2005). Composites of tests have better validity. The Table provides diagnostic accuracy statistics for the different composites of tests for SIJ pain (Laslett et al 2005).

<table>
<thead>
<tr>
<th>Test composite</th>
<th>Sensitivity</th>
<th>Specificity</th>
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</thead>
<tbody>
<tr>
<td>One or more</td>
<td>1.00</td>
<td>0.44</td>
</tr>
<tr>
<td>Two or more</td>
<td>0.93</td>
<td>0.66</td>
</tr>
<tr>
<td>Three or more</td>
<td>0.94</td>
<td>0.78</td>
</tr>
<tr>
<td>Four or more</td>
<td>0.60</td>
<td>0.81</td>
</tr>
<tr>
<td>Five or more</td>
<td>0.27</td>
<td>0.88</td>
</tr>
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</table>

SIJ provocation tests commonly provoke false positive pain in the presence of discogenic pain. Diagnostic accuracy of composites of SIJ tests improves when interpretation is confined to a subset of back pain patients whose symptoms cannot be made to ‘centralise’ with repeated movement testing. Centralisation is highly specific to discogenic pain and positive SIJ tests in these patients should be ignored. Sensitivity and specificity of three or more positive SIJ provocation tests in non-centralising patients is 0.91 (95% CI 0.62 to 0.98) and 0.83 (95% CI 0.68 to 0.96) (Laslett et al 2003).

Commentary

There is some confusion in the literature regarding naming of the tests. Distraction and compression are sometimes reversed with regard to the tests they describe (Albert et al 2000) – erroneously, I believe. The compression test may be called the separation test (Albert et al 2000) and a modified thigh thrust test may be called the posterior pelvic pain provocation (or 4P) test (Ostgaard et al 1994).

The composite of three or more positive SIJ tests has positive and negative likelihood ratios of 4.02 (95% CI 2.0 to 7.8) and 0.19 (95% CI 0.07 to 0.47) respectively (van der Wurff et al 2006). This is almost exactly the same as the values achieved in an earlier study (Laslett & Williams 2000b). While this clinical prediction rule is useful the false positive rate is significant. SIJ pain is rarely co-existent with other sources of low back pain (Schwarzer et al 1994, 1995) except in pregnancy (Gutke et al 2006). When the source of pain is known to be from a structure other than the SIJ, the results of the SIJ provocation tests should be considered false positive.

SIJ pain is quite a different concept from SIJ dysfunction. The latter concept is hypothetical at best. Tests used to identify SIJ dysfunction are unreliable (van der Wurff et al 2000a) and invalid against diagnostic injection as a reference standard (van der Wurff et al 2000b). However, the reference standard of diagnostic injection has limitations. Since only the internal structures of the SIJ are anaesthetised by the procedure, extra-articular SIJ ligamentous pain is not identified. Consequently, the false positive rates of pain provocation and SIJ dysfunction tests may be over-estimated in studies using diagnostic injection as a reference standard (van der Wurff et al 2006).

Future research can now be constructed where patients most likely to have SIJ pain can be identified as a subgroup. The most powerful clinical method of identifying SIJ pain patients is the rule whereby these patients’ pain does not centralise with repeated movement testing and there are at least three positive SIJ provocation tests.

In summary, the clinical prediction rule of three or more provocations tests that provoke familiar back pain and non-centralisation of pain is a useful tool to identify patients more likely to have SIJ pain than some other painful condition.

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References