Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain (Review)

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[Diagnostic Test Accuracy Review]

Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain

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ABSTRACT

Background

Low-back pain with leg pain (sciatica) may be caused by a herniated intervertebral disc exerting pressure on the nerve root. Most patients will respond to conservative treatment, but in carefully selected patients, surgical discectomy may provide faster relief of symptoms. Primary care clinicians use patient history and physical examination to evaluate the likelihood of disc herniation and select patients for further imaging and possible surgery.

Objectives

(1) To assess the performance of tests performed during physical examination (alone or in combination) to identify radiculopathy due to lower lumbar disc herniation in patients with low-back pain and sciatica;

(2) To assess the influence of sources of heterogeneity on diagnostic performance.

Search strategy

We searched electronic databases for primary studies: PubMed (includes MEDLINE), EMBASE, and CINAHL, and (systematic) reviews: PubMed and Medion (all from earliest until 30 April 2008), and checked references of retrieved articles.

Selection criteria

We considered studies if they compared the results of tests performed during physical examination on patients with back pain with those of diagnostic imaging (MRI, CT, myelography) or findings at surgery.

Data collection and analysis

Two review authors assessed the quality of each publication with the QUADAS tool, and extracted details on patient and study design characteristics, index tests and reference standard, and the diagnostic two-by-two table. We presented information on sensitivities and specificities with 95% confidence intervals (95% CI) for all aspects of physical examination. Pooled estimates of sensitivity and specificity were computed for subsets of studies showing sufficient clinical and statistical homogeneity.

Main results

We included 16 cohort studies (median N = 126, range 71 to 2504) and three case control studies (38 to100 cases). Only one study was carried out in a primary care population. When used in isolation, diagnostic performance of most physical tests (scoliosis, paresis or muscle weakness, muscle wasting, impaired reflexes, sensory deficits) was poor. Some tests (forward flexion, hyper-extension test, and slump test) performed slightly better, but the number of studies was small. In the one primary care study, most tests showed higher specificity and lower sensitivity compared to other settings.

Most studies assessed the Straight Leg Raising (SLR) test. In surgical populations, characterized by a high prevalence of disc herniation (58% to 98%), the SLR showed high sensitivity (pooled estimate 0.92, 95% CI: 0.87 to 0.95) with widely varying specificity (0.10 to 1.00, pooled estimate 0.28, 95% CI: 0.18 to 0.40). Results of studies using imaging showed more heterogeneity and poorer sensitivity. The crossed SLR showed high specificity (pooled estimate 0.90, 95% CI: 0.85 to 0.94) with consistently low sensitivity (pooled estimate 0.28, 95% CI: 0.22 to 0.35).

Combining positive test results increased the specificity of physical tests, but few studies presented data on test combinations.

Authors' conclusions

When used in isolation, current evidence indicates poor diagnostic performance of most physical tests used to identify lumbar disc herniation. However, most findings arise from surgical populations and may not apply to primary care or non-selected populations. Better performance may be obtained when tests are combined.