Various history and physical examination characteristics predicted nerve root compression


QUESTION: In patients presenting to a primary care physician with a new episode of pain radiating into the leg, how accurate are history and physical examination characteristics for detecting nerve root compression?

Design
Blinded comparison of history and physical examination characteristics with magnetic resonance (MR) imaging.

Setting
Neurology department of a university hospital in Maastricht, the Netherlands.

Patients
274 patients (mean age 46 y; 51% men) with a new episode of pain radiating into the leg. Exclusion criteria were previous spinal surgery, pregnancy, severe comorbidity, or contraindication to MR imaging.

Main results
56% of MR imaging studies detected root compression. Several history and physical examination tests independently predicted nerve root compression. For a model that included only history variables, the area under the receiver operating characteristic (ROC) curve was 0.83; for a model that included only history variables, the area under the ROC curve was 0.80.

Conclusion
In patients presenting to a primary care physician with a new episode of severe pain radiating into the leg, history and physical examination characteristics predicted nerve root compression on magnetic resonance imaging.

Commentary
The study by Vroomen et al focuses on a group of patients referred from primary care with sciatica severe enough that it might warrant 14 days of bed rest, which was incidentally shown to be ineffective. These criteria gave a high pre-test probability of disc herniation, with an associated rate of nerve root compression of 56%. This should be interpreted against an underlying prevalence of lumbar disc herniations of 20% in asymptomatic persons < 40 years of age and 27% in those > 40 years of age.

The area under the ROC curve describes the ability of a test to discriminate those with nerve root compression from those without compression. An area under the ROC curve of 0.5 represents a worthless test (equivalent to tossing a coin). With an area under the ROC curve of 0.8, history alone is in the "good" range. With the addition of physical examination, the area under the curve increases marginally to 0.83. These findings are concordant with a previous study comparing history and examination with computed tomography scanning in the diagnosis of radicular leg pain.

What is the point of physical examination and MR imaging when the history suggests radicular leg pain? Examination defines the extent of radiculopathy accompanying the radicular pain by seeking signs of nerve dysfunction. Decisions about management are based principally on history and examination, and not on radiological findings. The role of MR imaging is to define and locate the pathology. Given the favorable natural history of radicular pain within the first month, MR imaging is justified only in a small proportion of those who fail to improve with time or have serious neurological deficits warranting surgical intervention or exclusion of rare but serious pathologies.

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