Diagnosis of Low Back Pain

Low back pain ranks as the leading cause of years lived with disability worldwide. Although best practice guidelines share a consistent diagnostic approach for the evaluation of patients with low back pain, confusion remains as to what extent patient history and physical examination findings can inform management strategies.

1. Demographics

Twenty-two primary studies investigated the diagnostic value of demographic variables, including age, gender, BMI, job type, smoking status, living situation, and education level for the diagnosis of patients with LBP. Overall, only age and BMI appeared clinically informative as stand-alone findings. Older age at different cutoffs (i.e., >65 years, >70 years, and >75 years) consistently increased the likelihood of LSS and spinal fracture. One secondary care study identified "BMI < 22" as a valuable clinical finding for the diagnosis of osteoporotic spinal fracture. When combined with other clinical findings, female gender and "age > 50 years" were also identified as clinically informative for the diagnosis of spinal fracture and spinal malignancy, respectively. As such, age, BMI and gender should be considered as potentially valuable demographic variables for the diagnostic triage of patients with LBP.

2. Patient History

Twenty-two primary studies provided data on the diagnostic accuracy of patient history findings for the diagnosis of LBP. Most studies (17 of 22) investigated the diagnostic value of clinical findings used to diagnose LSS or specific LBP. Bilateral lower-extremity symptoms and "leg pain worse than back pain" significantly increased the likelihood of LSS when used in isolation. Pain relief upon sitting, improvement of symptoms with lumbar flexion, and pain exacerbation while standing up or walking showed inconsistent diagnostic accuracy as stand-alone findings but appeared to increase the likelihood of LSS when used in combination. For the diagnosis of specific LBP, bladder/bowel/saddle dysfunction, a previous history of trauma, prolonged corticosteroid use, a recent infection, and immunosuppression were identified as clinically informative when used in isolation. Dermatomal distribution of pain was the only index test identified as clinically informative in at least two primary studies for the diagnosis of radicular syndrome. All other index tests investigated yielded imprecise or poor diagnostic accuracy data. Overall, dominant site of pain (back or leg), pain distribution (dermatomal or non-dermatomal; unilateral or bilateral), aggravating or relieving factors and indicators of underlying spinal pathology should all be questioned when triaging patients with LBP.

3. Physical Examination

One hundred primary studies investigated the diagnostic accuracy of physical examination findings for the diagnosis of LBP. Inconsistent evidence supports the use of neurological examination components (i.e., sensory deficits, motor deficits, impaired reflexes) as stand-alone findings for the diagnosis of LSS and radicular syndrome. There is promising, yet imprecise evidence supporting the use of the treadmill walking test (i.e., neurological changes induced by level walking) and of lumbar ranges of motion (i.e., symptoms induced by having the patient bend backward) in identifying patients with LSS. Neurodynamic tests (i.e., Slump test and SLR) exhibited variable diagnostic value in diagnosing patients with radicular syndrome in secondary and tertiary care settings and were identified as not clinically informative in primary care populations. Based on the current literature, there is insufficient evidence to recommend the use of other physical examination findings in isolation when triaging patients with LBP.

4. Clinical Support Tools

After reviewing several studies that investigated the diagnostic performance of clinical support tools for the diagnosis of LBP, the analysis revealed that some clinical elements, deemed uninformative when used alone, should still be considered when evaluating patients with LBP. For the diagnosis of non-specific LBP, the presence of three or more positive provocation tests (i.e., distraction, compression, thigh thrust, sacral thrust and Gaenslen's test) appears potentially useful to diagnose LBP originating from the SIJ. For the diagnosis of spinal malignancy, a previous history of malignancy, unexplained weight loss, and failure to improve with conservative care should be questioned, as well as the presence of fever, spinal pain, and neurological deficits for the diagnosis of spinal fracture. Finally, the presence of morning stiffness, improvement in back pain with exercise but not rest, awakening because of pain in the second half of the night, and alternating buttock pain were identified as clinically informative when used in combination for the diagnosis of IBP.

5. Factors Affecting Interpretation

Interpretation of the findings may be influenced by several factors. First, most primary studies were conducted in secondary or tertiary care settings, predominantly including surgical populations. These studies generally selected patients based on a specific set of positive clinical and imaging findings, which may not be representative of patients presenting in primary settings. This could result in an overestimation of diagnostic performance. Researches also highlighted that despite a substantial increase in available evidence on patient evaluation components used for the diagnosis of LBP in the past 20 years, several index tests have been investigated by a small number of studies, still lack adequate evidence, and demonstrate imprecise diagnostic accuracy values. Moreover, many clinical features endorsed by clinical practice guidelines were not investigated in primary care settings. For instance, guidelines from seven different countries recommend using "disturbance of urinary and bowel sphincters", and "saddle anesthesia" for the diagnosis of CES [1]. However, only one primary care study investigated these characteristics and found that they resulted in only a small increase in the post-test probability of CES [2].

Additionally, it is important to note that most studies poorly described index test procedures and did not provide cutoff values for positivity. Further, most studies provided diagnostic accuracy values for index tests used in isolation, rather than in combination with other clinical findings. This limits the applicability of the study results in clinical practice, as patient evaluation components are usually considered in combination to estimate the likelihood of a condition. To address these limitations, Finucane et al. [3], proposed an international framework that is intended to assist healthcare providers in identifying patients with underlying spinal conditions who may require further investigation or referral to a medical specialist. The authors emphasized the importance of not just considering the presence or absence of red flags when deciding whether to refer a patient or not, but also the clinical setting in which a patient presents, the quality of evidence supporting the use of each clinical finding, and the potential impact on patient outcomes.

References

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