Review Article

Diagnostic approach to low back pain
Bel ağrılarına tanısal yaklaşım

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Abstract

Low back pain is an important cause of pain referrals in the primary care setting. Overall, 85% of initial admissions are considered to be nonspecific low back pain that resolves in a few weeks without the need for additional evaluation. Myofascial pain, lumbar disc herniation, spinal stenosis, facet joint and disc degeneration, and sacroiliac joint pathologies are common causes of mechanical low back pain. Non-mechanical low back pain includes infections of the vertebral corpus and disc, malignant tumors and metastases, and inflammatory diseases. Red flag symptoms suggestive of serious diseases should be evaluated in all patients with low back pain, and the diagnosis process should be accelerated in patients with these symptoms. The so-called "yellow flags" associated with chronic low back pain include psychosocial factors. In the diagnosis process, pain relief is observed in patients with non-specific low back pain without the need for imaging methods. Laboratory tests and imaging methods can be used to distinguish other causes of low back pain.

Keywords: Low back pain, primary care, red flag symptoms, pes planus, flatfoot, risk factors

Öz

Bel ağrısı birinci basamakta ağrı başvurularında önemli yer tutar. İlk başvuruların % 85'i nonspesifik bel ağrısıdır ve ek değerlendirmeye gerek kalmadan birkaç haftada iyileşir. Myofasiyal ağrı, lomber disk hernisi, spinal stenoz, faset eklem ve disk dejenerasyonu, sakroiliak eklem patolojileri sık görülen mekanik bel ağrısı nedenleridir. Non-mekanik bel ağrıları arasında vertebral korpus ve diskin enfeksiyonları, malign tümör/metastazlar ve inflamatuar hastalıklar yer alır. Bel ağrılı tüm hastalarda ciddi hastalıkları düşündüren kırmızı bayrak semptomları mutlaka değerlendirilmeli ve bu semptomların bulunduğu hastalarda tanı süreci hızlandırılmalıdır. Bel ağrısının kronikleşmesi ile ilgili sarı bayraklar olarak adlandırılan semptomlar psikososyal faktörleri içerir. Tanı sürecinde nonspesifik bel ağrılı hastalarda görüntüleme yöntemlerine gerek kalmadan, ağrının azaldığı gözlenir. Diğer bel ağrısı nedenlerini ayırmada, laboratuvar tetkiklerinden ve görüntüleme yöntemlerinden faydalanılabilir.

Anahtar Kelimeler: Bel ağrısı, birincil bakım, kırmızı bayrak semptomlar, pes planus, düz tabanlık

Key Points

1. Low back pain is one of the most common causes of musculoskeletal pain.
2. Most initial presentations with low back pain are considered nonspecific and resolve within a few weeks without the need for additional evaluation.
3. The presence of red flag symptoms in patients is important and should be evaluated in every patient.

Introduction

Low back pain is among the most common causes of pain in industrialized societies. Overall, 84% of adults are known to experience low back pain at some point in their lives [1]. The studies on the prevalence of low back pain revealed that the lifetime prevalence is 38.9%, and the prevalence over 60 years of age ranges from 21% to 75% [2, 3, 4]. Low back pain has been associated with impaired quality of life and loss of work force in the adult patient population, as well as a serious healthcare burden.

In patients presenting with low back pain, the diagnostic work-up is an important step in terms of determining the etiology and the subsequent treatment. Using an algorithm-based approach enables clinicians to identify the cause of low back pain in a shorter time and more effectively. Thus, the cost of serious health expenditures can be reduced while providing good health care.

It is noted that 85% of low back pain admissions in the primary care setting are related to non-specific low back pain. The non-specific low back pain refers to a condition characterized by lack of a specific underlying cause and spontaneous recovery in most patients within a few weeks and without a confirmed diagnosis. Since these patients are expected to recover in a short time, imaging modalities are usually not required [5].

Basically, mechanical low back pain is considered the pain that occurs secondary to vertebral or disc and surrounding soft tissue involvement and appears with physical activity. Myofascial pain, facet and disc degeneration, disc herniation, spinal stenosis, sacroiliac joint pathologies, vertebral compression fractures, and acute or chronic traumatic injuries are the most common causes of mechanical low back pain. Myofascial pain is a common cause of low back pain, particularly after trauma or repetitive motions. Pain radiates to the paravertebral region. It increases with movement. Palpable trigger points within the muscle are detectable on physical examination [6].

Pain in facet degeneration can be caused by stretching of the facet joint capsule or by facet osteoarthritis. It produces pain in the paravertebral region rather than the midline, radiating to the thigh and hip, sometimes ending in the knee. Pain intensity is increased by lumbar extension. No neurological deficit is observed. Disc degeneration may accompany facet degeneration. Leaning forward increases the pain in the midline. Imaging reveals decreased vertebral disc space [7].

Disc herniation is a frequent cause of low back pain in people ages 30 to 50 and occurs more commonly in men. It may present with low back pain, leg pain, or pain radiating from the waist to the leg. A herniated disc may cause radiculopathy in the compressed nerve root, which causes changes in sensory, motor, and reflexes. L5-S1 radiculopathy is the most commonly encountered radiculopathy [7]. Cauda equina syndrome, which is a serious pathology that usually develops in relation to large central disc hernias, is seen in less than 1% of patients with low back pain and is a rare cause of low back pain in the primary care setting. In these patients, muscle weakness, saddle-style anesthesia, bladder, and bowel dysfunction can be seen [8].

Lumbar spinal stenosis is the narrowing of the spinal canal due to degenerative processes associated with aging. The most common causes are lumbar osteoarthritis, ligamentum flavum hypertrophy, disc herniation, and spondylolisthesis. Although some patients may show signs of stenosis also at the anteroposterior spinal canal diameter of < 12 mm, a diameter of less than 10 mm is considered to be spinal stenosis. The clinical picture may involve neurogenic claudication, motor and sensory symptoms, in addition to low back pain. The pain is aggravated by standing upright and walking downhill, while being relieved by sitting, squatting, and leaning forward [6].

Vertebral compression fractures are a common cause of low back pain in the elderly population. In these patients, there may be severe pain due to acute collapse as well as chronic low-grade pain. Care should be taken for vertebral fractures, particularly in patients with osteoporosis and corticosteroid use [5, 9].

Sacroiliac joint pain causes low back and hip pain near the posterior superior iliac spine. The pain worsens with sitting and may be confused with pain in the lower lumbar facets [7].

Non-mechanical low back pain is caused by infectious, malignant, and inflammatory disorders. The most common infectious conditions are spondylitis, spondylodiscitis, epidural abscesses, and muscle and soft tissue abscesses. The pain starts insidiously and worsens, especially at night. It is mostly localized to the infected area. However, it can spread to the abdomen, legs, and perineum. The pain is accompanied by fever in half of the cases. The most common infectious agents are pyogenic (S. aureus), brucella, and tuberculosis.

Vertebral lytic metastases of malignant tumors, pathological fractures due to metastases, and compression by space-occupying lesions may give rise to severe low back pain. In such cases where malignant tumors affect the vertebrae, the pain usually continues day and night and does not respond to simple analgesics [5, 9].

Inflammatory low back pain is seen in axial spondyloarthropathy (i.e., ankylosing spondylitis, psoriatic arthritis, arthritis due to inflammatory bowel disease, reactive arthritis). Inflammatory low back pain is characterized by onset under the age of 40, an insidious onset, a duration of at least 3 months, accompanying morning stiffness (at least half an hour), increase with inactivity, and relief by exercise. In a patient with chronic inflammatory low back pain, the diagnostic work-up involves a detailed evaluation of the spondyloarthropathy symptoms, sacroiliac joint imaging methods, and the HLA-B27 test [8].

In addition to nonspecific, mechanical, and non-mechanical causes, sometimes pathologies originating from other organs and systems (pelvic inflammatory disease, endometriosis, pyelonephritis, prostatitis, nephrolithiasis, diverticulitis, cholelithiasis, aortic aneurysm) may also cause low back pain. These conditions may need to be considered in the differential diagnosis [5, 9].

Low back pain is considered chronic when it exceeds 12 weeks [10]. The risk factors for the chronicity of acute low back pain are summarized in Table 1.

Table 1. Factors affecting the chronicity of acute low back pain [7].

Genetic factors	Traumatic injuries
Female gender	Occupational hazards (construction worker, low job satisfaction, hostile work environment)
Lifestyle (sedentary life, obesity, smoking)	Secondary gain
Psychosocial factors (poor social support, anxiety, depression)	Greater disease burden (i.e., higher baseline pain, more disability and opioid use)
Weak coping strategies	

Clinical evaluation

Initial evaluation of patients presenting with low back pain should begin with a focused anamnesis. In the history, the location of the pain should be questioned first, and the patient should be asked to manually locate the painful area. Afterwards, the duration of symptoms (acute-subacute-chronic), severity, timing (morning/night, intermittent/continuous), aggravating and relieving factors (such as sitting, lying, bending forward), the extent of pain, and accompanying symptoms (paresthesia, burning), should be questioned. The presence of so-called "red flags" in a patient presenting with low back pain may indicate a serious underlying pathology that requires rapid and detailed evaluation of the patient (Table 2). It is reported that less than 1% of patients presenting with low back pain have systemic findings. If pain worsening at night is accompanied by weight loss, spinal tumors and metastases should be considered first. The most common malignancies that metastasize to the bone are breast, lung, kidney, and prostate cancers. In cases of severe low back pain in patients with a history of previous malignancy, spinal tumors and metastases should be considered at the forefront, and the patient should be evaluated in detail in this regard. Spinal infection should be considered in cases of recent fever and malaise, injection into the spinal region, and epidural catheter placement among patients who are on intravenous drugs or immunosuppressed. In addition, the possibility of vertebral fracture should be excluded in patients with low back pain, corticosteroid use, and osteoporosis, even in the absence of serious trauma [11].

Patients with chronic low back pain should also be evaluated in terms of psychological and social factors. Patients with chronic low back pain generally consider that pain is the result of a physical injury. As long as the pain continues, fear and avoidance behaviors develop that further increase disability, depression, and anxiety. Eventually, the patient enters a vicious cycle where the pain gets worse by avoiding painful movements and activities [12]. Psychosocial risk indicators that are effective in the development and chronicity of long-term disability, including work loss, are called "yellow flags" (Table 3).

Table 2. Red flags in lower back pain [7].

Patient history	Symptoms and signs
Age>50 or >70 years	Fever, night sweats
History of malignancy	Pain that worsens with rest/night lying down
Corticosteroid use	Saddle type anesthesia
Trauma	Lower extremity weakness
Immunosuppression	Bladder bowel dysfunction
Intravenous drug use	Walking disorder
Weight Loss	Sudden, unexplained weight loss
History of osteoporosis	Inflammatory low back pain

Table 3. Yellow flags in low back pain [7].

Excessive pain and disability in the beginning	Low socioeconomic status
Sleep problems	General health-related events (opioid use, sedentary lifestyle)
Depression	Fear avoidance behavior
Anxiety	Irritability
Work dissatisfaction	Toxic relationships
Poor social support	Decreased perceived control over one's life

Physical examination

A detailed physical examination should be performed after a focused history is obtained from a patient with low back pain. The examination begins as the patient enters the door, and the patient's posture, gait, behavior, and mood can provide important information about the patient in the initial assessment. Inspection should be performed while the waist and back of the patient are uncovered. The presence of scars, rashes, trauma, and surgical scars on the skin should be examined. The initial assessment of posture and misalignment (lordosis, kyphosis, and scoliosis) provides important information. Sometimes the etiological diagnosis can be reached only by inspection. Palpation of spinous processes, paravertebral muscles, and surrounding structures should then be performed. Sensitivity on palpation is a guide to the problems of the related structures. After palpation, the range of motion at the waist is evaluated. The pain caused by bending forward suggests pathologies related to the disc and vertebral corpus, and the pain caused by bending backwards suggests posterior element pathologies such as vertebral facet syndrome. Pain that occurs when bending laterally and radiates to the leg may be an indicator of radiculopathy. Neurological examination, including sensory, motor, and reflex tests, should be performed to determine the relevant nerve root pathology in patients with low back pain. Finally, special tests such as the straight

leg raise test, laseq test, FABER (flexion, abduction, external rotation) test, FADIR (flexion, adduction, internal rotation) test, and sacroiliac joint tests should be evaluated.

Laboratory

Laboratory tests are rarely needed in the evaluation of a patient with low back pain. In patients with suspected systemic disease, malignancy, or infection, tests of hemogram, erythrocyte sedimentation ratio, C-reactive protein, brucella, and tuberculosis can be performed when necessary. In patients with suspected disc herniation and radiculopathy, an EMG examination requested to identify the relevant nerve root provides valuable information in confirming whether radiological findings can be the source of the patient's symptoms.

Imaging

The history and physical examination performed at the initial evaluation are very valuable in deciding whether the patient should undergo imaging. Imaging is considered not necessary in the case of nonspecific low back pain given that it lasts less than 4 weeks and is expected to recover soon [13]. The presence of red flags and severe and progressive neurological deficits necessitate performing imaging studies in acute low back pain. In chronic low back pain, a case-specific evaluation should be made for pathologies such as spinal stenosis, disc herniation, and radiculopathy [14]. Among the imaging methods, x-rays can be used for spinal instability (flexion and extension graphs), scoliosis, and spondylolisthesis scanning. Advanced imaging modalities include computed tomography and magnetic resonance imaging. Further imaging should be performed if persistent low back pain cannot be explained by radiographs or if there is significant clinical suspicion for an underlying systemic disease, such as red flag signs [14, 15]. MRI or CT can be used for this purpose [16].

Conflict of interest: The author has no conflict of interest in this study

	Author Contributions	Author Initials
SCD	Study Conception and Design	BK
AD	Acquisition of Data	BK
AID	Analysis and Interpretation of Data	BK
DM	Drafting of Manuscript	BK
CR	Critical Revision	BK

Financial support: None

Prior Publication: The article was not presented as a paper or published in another journal beforehand.

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