



BACK PAIN: A RECENT REVIEW

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ABSTRACT

Low back pain affects people of all ages and is a major contributor to the global disease burden. Despite advances in assessment and treatment methods, researchers and clinicians alike continue to face difficulties in managing low back pain. The large variation in manifestations, possible causes, precipitating and maintaining factors, course, prognosis, and consequences in terms of activity interference and quality of life is one reason for the limited success in identifying effective treatments. Increasing evidence suggests that central pain-modulating mechanisms and pain cognitions play important roles in the development of chronic, disabling low back pain. Cost, health-care use, and disability from low back pain vary significantly across countries and are influenced by local culture and social systems, as well as beliefs about cause and effect.

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INTRODUCTION

Back pain is a typical issue. It affects people of all ages, from children to the elderly, in high-income, middle-income, and low-income countries. Low back pain is becoming the biggest cause of disability worldwide. A unique reason for sensation of pain cannot be identified in nearly all patients suffering from low back pain. Only a small percentage of persons have a well-understood clinical etiology, such as a vertebral fracture, malignancy, or infection. People with physically demanding employment, physical and mental illnesses, smokers, and obese individuals are more likely to experience low back ache.[1] Almost everyone experiences a brief, acute episode of low back pain at some point in their lives. Although many people recover from back pain within a year, some acquire a chronic illness with fluctuating or persistent pain of low or medium severity, interrupted by periods of no pain or acute exacerbation. When back pain lasts more than three months, it is (by consensus) no longer regarded as a symptom but as a disorder in and of itself, sustained by factors other than the beginning reasons.[2]

A certain cause of low back pain may rarely be determined; the majority of low back pain is hence called non-specific. Lower back pain characterizes a variety of bio-physical, psychological and social characteristics which adversely affect function, society and personal financial status. Low back pain's financial impact is cross sectoral since both healthcare systems and social support systems are increasing costs.[3] The purpose of this study is to offer a current understanding of low back pain, including its prevalence and global impact, as well as an outline of its causes and progression.

It is characterized by the site of discomfort, which is usually between the lower rib borders and the buttock creases. It is frequently accompanied by ache in one or both legs and some persons who have low back pain also have neurological symptoms in their lower limbs. [4]The effect on people with low back pain often goes beyond the effect of low back pain or complications by themselves. This results in more treatment, but usually a worse response to a variety of treatments.[5] As a natural consequence, a wide variety of problems are associated with several patients with low back pain, including behavioral, social and physiochemical factors and co-mechanisms and mechanisms that influence suffering and the associated disability.

Epidemiology

Low back pain (LBP) is a major source of suffering for both patients and the public. In addition, under the Global Burden of Disease Study of 2016, the lead causes of YLD (years of low back pain) were studied in 188 countries and ranked among the top ten causes of YLD. In one comprehensive evaluation of 165 articles from 54 countries, the mean point prevalence of low back pain in the general population was 18%, and the 1-month prevalence was 30%. Lifetime prevalence was 40%, and it was especially high in people aged 40–80 years old and in women, who have a 20% higher risk of low back pain than men.[6] Socioeconomically disadvantaged groups are far more likely than their socioeconomically advantaged counterparts to experience persistent discomfort and significant difficulty with daily functioning.[7] It is estimated that the probability of experiencing recurrent low back pain within a year of the conclusion of an episode of acute low back pain is 25%.[8]

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The occurrence of chronic low back pain in the general population in Italy is approximated to be 5.91 percent. Adults' rates of acute and chronic low back pain have more than doubled in the last decade, and this trend is expected to continue as the population ages, affecting men and women of all different groups. Pain limits occupational activities and is a major cause of absenteeism, hence low back pain has a considerable influence on functional ability. Its economic toll is shown directly by high health-care expenses and indirectly by diminished productivity. These prices are projected to grow much further in the coming years. According to a 2006 analysis, the total expenditures related with LBP in the United States surpass \$100 billion per year, with lost wages and impaired productivity accounting for two-thirds of the total.[9] More than a quarter of Americans report having had low back pain in the previous three months, with adults aged 45 to 64 years representing the greatest incidence, and a lifetime prevalence of up to 84 percent. Women are a little more affected than men, and their recurrence rate is higher as well. Radicular involvement is less common, with prevalence rates ranging from 1.2 to 43 percent. Obesity, advancing age, manual labour (twisting, heavy lifting, vibration), smoking, psychological characteristics (depression, stress), and involuntary movements are all risk factors for back pain. [10]

Categories of Back Pain

In most situations, including those seeking medical help for acute or recurrent pain or chronic symptoms, the pathophysiology underlying low back pain is unknown. The goal of determining the aetiology of back pain in these people has proven to be elusive. Because back pain is a symptom, it can be caused by a variety of factors, including local and systemic factors like musculoskeletal tissue structural failure, inflammatory and immunological responses, genetic predisposition, excessive static or dynamic loading, emotional state, behavioural and environmental factors, and beliefs and expectations about what might happen with back pain.[11] While there are some similarities between musculoskeletal and neurologic low back pain, the presence (or lack) of nerve root involvement leads in two separate pathophysiologic entities.

Neurologic Low Back Pain

In 90% of people under the age of 65 who have radicular discomfort, the pain is caused by nerve root compression caused by disc herniation. Because the disc contains no nociceptive fibres, the herniated piece does not cause pain unless it comes into contact with the dural lining of the spinal nerve or the posterior longitudinal ligament. Ligamentous hypertrophy, osteophyte formation, facet joint arthropathy, and neural foraminal constriction are other age-related spinal arthritis alterations that commonly affect the nerve root in older patients, while disc herniation might even contribute. Nerve root compression causes focal ischemia, which can disrupt axon transit and cause edema. Local inflammation may also arise as a result of an immunogenic reaction to the exposed nucleus contents. This, together with structural changes produced by compression, can lead to more severe radicular pain.[10]

Musculoskeletal Low Back Pain

In the majority of cases, the cause of non-neurologic back pain is nonspecific and difficult to identify. spine changes as well as injury to local spinal parts including the vertebrae, tendons, and surrounding muscles and soft tissues are potential causes. Heavy lifting and other activities that put strain on the muscles or tendons can cause muscle fibre damage. Exercises or overuse of the paraspinal muscles, particularly those which are inactive at normal, can cause pain and spasms due to physiological hyperactivity. Arthropathy may also play a role in the development of back pain. [10]

Uncomplicated Back Pain Injury Form

Although the majority of people who suffer from low back pain lack noticeable disease or pathology, this sort of pain, especially when discomfort happens on workplaces, has long been explained by an injury model. For many years, low back pain has been regarded as a consequence of excessive stress or trauma from physically challenging activities, such as handling heavy goods that cause vertebrae injury or degeneration, intervertebral discs or spinal muscles. However, this is too simple an explanation, especially when strong physical demands are modestly associated with structural degenerative alterations in these structures and pathophysiology.[12] Several other lines of study have prompted this 'injury' approach to low back pain to be reconsidered. First, many low back pain episodes do not occur in a physical injury model: one-third cannot recollect an event trigger in a study in 1,172 patients with acute low back pain. [13] Furthermore, exposure to non-painful triggers (for example fatigue) or cognitive triggers (for example distracting) was as dangerous as exposure to physical triggers (for example, lifting) and exposure to both physical and non-physical triggers. A greater likelihood of back pain than one component was related with physical triggers.[14]

Second, new claims on back pain but not the physical characteristics of work (such as spinal load) or the physical abilities of worker were predictive in cohort studies evaluation of long term potential risk factors for back pain, job dissatisfaction and emotional distress (such as back muscle strength). These findings do not support a model of back pain for physical injuries.[15]

Risk factors

Back pain is a complicated and multifaceted disorder which is prone to occur because of the combination of various risk factors.[16] Because of the high back pain incidence, many people suffer at least once in their lives an episode of acute low back pain. However, a higher incidence of low back discomfort involves certain risk factors. Systematic assessments of risk factors for low back pain and sciatica have revealed that physical risk factors (e.g., prolonged standing, heavy weights lifting), unhealthy lifestyles (smoking and obesity) and psychological factors (e.g. unhappiness, and pains expectancies) enhance the probability of a back pain episode. In addition, patients were identified in the course of manual activities including heavy loads, uncomfortable posture, not near to the body lifting objects and distracted during an activity or work as the cause of the new sudden beginning of acute low back pain.[17]

Many researchers and clinicians are attempting to identify risk factors. While human beings' erect posture is frequently blamed, the natural curvatures of the spine are uniquely suited for this posture and its tasks. Curve distortions caused by the heavy paunch of obesity or pregnancy can cause low back pain. Men are far more at risk than women in the early years, but this tends to even out in later years. Actual disc herniation (not just protrusion) and spinal stenosis with marked diminution of the space for the cauda equina are demonstrable risk factors, but they are far from the most common, despite the fact that disc protrusions are frequently blamed for back pain and are frequently subjected to surgical intervention with varying, usually unsuccessful, outcomes. Physical fitness will not eliminate back pain, but it will help to shorten the time it takes to recover in many cases.[18]

Neurological Symptoms of Low Back Pain

Lumbar Spinal Stenosis

Lumbar spinal stenosis is defined as pain or discomfort radiating into one or both lower limbs following prolonged walking or standing. Treatment such as rest or lumbar flexion are usually successful.[19] A combination of inflammatory changes, such as osteoarthritis and hypertrophy, as well as disc swelling, usually results in spinal canal narrowing. According to experts, the presence of specific symptoms and signs, as well as imaging confirmation of lumbar spinal canal narrowing, are now all required to diagnose the clinical syndrome of lumbar spinal stenosis.[20] The symptoms of lumbar spinal stenosis are thought to be caused by venous congestion or ischaemia of the cauda equina nerve roots as a result of compression.[01]

Radicular Pain and Radiculopathy

Radicular pain, also known as sciatica, occurs when the nerve roots are involved. Sciatica is a term used interchangeably by clinicians and patients to explain different kinds of back pain . [21] Radicular pain is diagnosed using medical history such as a history of anatomic leg pain, leg pain that is far worse than back pain, weakening of leg pain while coughing, sneezing [22], and the straight leg raise test. Radiculopathy is described as the occurrence of weakness, loss of stimulation, or loss of reflexes relating to a specific nerve root, or a combination among these, and can arise alongside radicular pain. People with low back pain and radicular pain are seen to be more deeply affected and have poorer outcomes than people with only low back pain. [23] The most common cause of pain is disc herniation especially in combination with local inflammation. Disc herniations, from the other hand, are a common imaging finding in the asymptomatic stage and usually resolve over time despite of pain relief. [24]

Diagnosis of Back Pain

Physical Examination

A physical examination, whether brief or thorough, is an important part of managing low back pain.[25] Vital signs, ambulation status (assistive devices, mobility, and gait), appearance, behaviour, signs of distress, skin, mood and affect, judgement, and thought process are all included in a general physical exam. Motor strength in the back and lower extremities, sensation, deep tendon reflex testing, and upper motor neuron reflexes should all be tested during a

neurological examination. This will assist the practitioner in diagnosing and/or excluding more specific causes of lower back pain, such as pathology of the spinal cord, nerve roots, or peripheral nerves.[26]

An examination of the thoracolumbar spine, palpation over the spinous process, range of motion movements, and tests for specific disorders are also included in the physical evaluation. The initial examination, which includes a thoracolumbar spine evaluation, provides information on posture and alignment.[27] This includes a special focus on kyphosis, lordosis, or scoliosis that is abnormal. Rashes, scars, swelling, and signs of trauma or inflammation should all be considered during a skin examination.[26]

Various tests for specific disorders are also included in the physical exam. The Patrick's test looks at hip and sacroiliac pathology, which are both linked to lower back pain. The examiner should passively flex, abduct, and externally rotate the hip while the patient is in a supine position. Hip pathology is indicated by groin pain, while sacroiliac joint pathology is indicated by back pain.[28]

Diagnostic work-up

Patients with suspected specific spinal disease or visceral disorders who require further diagnostic work-up are identified using a clinical assessment. Both nonspecific low back pain and radicular syndromes do not require additional initial diagnostic testing because the treatment for both disorders is the same. If a patient does not respond to a therapy trial and is a surgical candidate, imaging (for example, using MRI) is recommended to identify an abnormality that can be treated with surgery.[2] Only individuals with suspected spinal pathology or visceral disease should undergo diagnostic testing during the initial clinical examination. Patients with red flags, such as unexplained weight loss, have traditionally been identified as having a higher risk of these conditions, however, only a few red flags are highly accurate in terms of diagnosis(table.1).[29] When determining which patients require further diagnostic work-up, relying on a smaller subset of red flags with promising diagnostic accuracy and considering a combination of red flags in the context of a complete clinical assessment is a more useful approach. Other flags have been assigned to different types of prognostic factors, including orange (psychiatric symptoms), yellow (cognitive, emotional, and behavioural), blue (work-related), and black (system-related) flags, in addition to red flags.[30]

Some guidelines consider the consequences of a missed diagnosis as well as the certainty of the diagnosis when determining which patients require further diagnostic work-up. The specific diagnostic procedure will be determined by the suspected underlying disorder. Imaging of the vertebral column is required in patients with a suspected vertebral compression fracture to confirm or rule out the diagnosis. Those with a strong suspicion of axial spondyloarthritis should see a rheumatologist, while those with a weaker suspicion should wait until more scientific evidence becomes available.[2]

Diagnostic testing

Straight Leg-Raising Test

The straight leg-raising test is performed on a supine patient while the examiner raises the affected leg with the knee

extended. If radicular symptoms are reproduced or worsened when the leg is bent between 30 and 70 degrees, the test is positive and suggestive of L5 or S1 nerve root compression. Increases in symptoms of less than 30 degrees may be non-physiologic, whereas pain of more than 70 degrees may occur in healthy people but is unlikely to be clinically significant. This test can also be done while the patient is seated. Pain that occurs only when the patient is supine but not when the patient is sitting up (leg raised) suggests a nonorganic cause.[31]

Table 1 Flags refer to potential risk factors for the development of persistent pain and associated disability [30]

Flag	Nature
Red	Alerting features that, when present, raise the possibility of serious pathology.
Yellow	<ul style="list-style-type: none"> • Beliefs, appraisals and judgements • Emotional responses • Pain behaviour (including anxiety disorders)
Orange	Psychiatric symptoms
Black	systemic or contextual barriers
Blue	Perceptions of the relation between work and health

Patrick Test

The Patrick test (also known as the flexion, abduction, external rotation [FABER] test) is performed while the patient is supine, with the affected leg's lateral ankle placed on the contralateral knee.[10] The affected knee is then gradually lowered to the examination table. Pain during this movement indicates hip or sacroiliac joint pathology.

Palpation

After that, the patient is asked to lie prone. A pillow placed under the abdomen is often more comfortable and allows the lumbar paraspinal muscles to relax completely. A gentle palpatory screen is performed first to determine the extent and location of any muscle spasms, as well as changes in skin texture.[32]

Along with that, palpation is approached in such a systematic manner. Palpation is used to look for underlying intervertebral stiffness, tenderness, and pain over each spinous process, then on each side. Palpation should really be carried out in a systematic manner from the thoracolumbar junction to the lumbosacral junction. A palpation across the sacrum and buttocks completes the examination. Figuring tenderness somewhere within the lumbar spine in patients with LBP has been shown in studies to have a high level of reliability. Moreover, the lower the reliability, larger the specificity of the tenderness location. This contains myofascial trigger points, which have low inter-observer reliability. [32]

Diagnostic Imaging Tests

In the absence of red flags, imaging studies should not be obtained in patients with low back pain lasting less than 6 weeks, according to guidelines established by the American College of Physicians and the American Academy of Family Physicians. [10] An imaging scan may be required to obtain more information about the source of a patient's pain. If the patient's pain is moderate or severe, a diagnostic imaging test may be recommended. Typical imaging tests available.

An MRI, provides a detailed image of spinal structures without the use of radiation that x-rays require. Soft tissue abnormalities in the spine, such as muscles, ligaments, and

intervertebral discs, can be detected using an MRI. It is also used to detect spinal misalignments or joint overgrowth. Because it allows for optimal visualisation of the spinal cord (specifically the conusmedullaris), nerve roots, and intervertebral discs, MRI of the lumbar spine is the study of choice for neurologic back pain. When cancer and infection are suspected, it is also preferred over other studies.[33]

CT is more sensitive than MRI in detecting bony abnormalities and fractures, but it is less effective in visualising neural structures. CT is typically reserved for patients who are MRI contraindicated, such as those who have implanted devices that are MRI incompatible or those who have a history of metallic hardware from prior spine surgeries, which may result in significant artefact.[10]

X-rays and/or advanced imaging are used in imaging studies. Once conservative, therapeutically-oriented care for low spinal pain fails and the investigator decides to take images, he should start with lumbar spinal radiographs for weight loading. Laboratory tests are rarely required. After all, in relation to radiographs, patients with malignancy may test for advanced imaging with ERS or CRP. However, electrodiagnostic testing, for example electromyography and the velocity of conduction for nerves may aid in distinguished acute radiculopathy from chronic disease and determine whether the primary cause of patient symptoms is the radiological abnormalities.[34]

Treatment

The primary goals of treatment for patients presenting with acute low back pain with or without radiculopathy are pain control and function preservation. In the absence of red flags that would necessitate the initiation of immediate disease-appropriate treatment, conservative management for most cases of acute low back pain is supported by a favourable prognosis regardless of pain type, though recurrence rates range from 23% to 80%. [35]

For both acute and chronic lower back pain, pharmacological treatments are essential. For short-term relief, acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs) have been shown to be effective.[36] When compared to NSAIDs, acetaminophen has no discernible difference in analgesia at doses up to 4 g/day for acute pain. Acetaminophen, on the other hand, is slightly less effective than NSAIDs in treating chronic lower back pain. Acetaminophen has a favourable safety profile and is inexpensive; however, the clinical significance of generally asymptomatic aminotransferase elevations above 4 g/day is unknown [37], and its use with other acetaminophen-containing drugs should be avoided.

The treatment of acute and chronic low back pain also includes non-steroidal anti-inflammatory medications (NSAIDs), and both non-selective and COX-2 selective NSAIDs are shown to be more effective .[26] With reference to systemic side effects in the renal, cardiovascular and gastrointestinal areas, NSAIDs are recommended for the shortest period of time in the lowest effective dose. [37] The treatment of acute lower back pain was demonstrated by skeletal muscle relaxants. Analgesia is superior to placebo in two-week studies, but there is no clear difference between muscle relaxants. Sedation of the central nervous system (CNS) and the risk of falling are the main side effects of skeletal muscle relaxant use.[26]

The use of tricyclic antidepressants (TCA) has been shown to be beneficial in the treatment of lower back pain. TCAs cause analgesia by inhibiting serotonin and norepinephrine reuptake, blocking sodium channels, and antagonising NMDA receptors. Finally, antiepileptics are also used to treat low back pain. While gabapentin is shown to be analgesic with radiculopathy in low-back chronic pain. The advantage of Topiramate is weight loss, but it is also linked to dizziness, drowsiness and a rare disease known as nephrolithiasis. [26]

Surgery

Cauda equina compression and radiculopathy with rapidly progressive or severe neurologic deficits are currently considered indications for early surgery. In patients with spinal stenosis, surgery may be considered because systematic reviews indicate that surgical decompression results in better outcomes than non-operative management, though results are mixed and confounded by high crossover rates.[38]

Patients with radiculopathy who have milder deficits associated with a structural lesion on MRI or active denervation on EMG and do not respond to conservative treatment after 4 to 6 weeks may also be referred for surgery. Surgery has been found to be no different than intensive rehabilitation for patients with musculoskeletal back pain associated with nonspecific degenerative changes, but slightly superior to standard care.[39] Surgical approaches differ depending on the pathology and severity of structural changes, but most patients with spinal stenosis undergo decompressive laminectomy, whereas discectomy is used for herniated discs.[10]

CONCLUSION

The world's leading cause of disability is now low back pain. In low and medium-income countries in particular the burden of lower back pain is rising and already overburdened health care and social services systems are being put more strain into it. Persistent disability pain is common, however, and a range of physiological, mental, and social factors affect a large number of people. Growing evidence suggests that low pain in the back should generally be seen as chronic with regular relapses and remissions. Treatment should include self-management, suggestions for workplaces and physical activity for all patients, therapeutic and pharmacological intervention in a small number of patients, and a number of patients should have proper treatment and surgery. Psychological and social support should be provided as needed for all therapies for LBP and other musculoskeletal conditions. In patients who have a lot of pain, this is particularly important.

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