The management of acute low back pain in adults: a guide for the primary care physician

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Keywords: management, acute adult low back pain (LBP), spinal stenosis, radiculopathy

Abstract

To diagnose patients with acute low back pain (LBP), a focused physical examination needs to be conducted and a detailed history obtained. The patient should then be placed into one of three broad categories, namely nonspecific LBP, pain associated with radiculopathy or spinal stenosis, or back pain potentially associated with serious organic disease. The history should include an assessment of psychosocial risk factors that predict delayed healing and progression to chronic pain. Routine imaging is not required within the first three weeks of nonspecific LBP. Imaging should be performed for patients with severe or progressive neurological deficits, or when serious underlying pathology is suspected, based on the history and the physical examination. Patients should be advised of the benign course of nonspecific LBP and that over 90% of patients recover within a few weeks. Occasionally, the pain may last for a few months. Patients should be advised to remain active and should be provided with information on effective self-care options. Usually, first-line medication options are paracetamol or nonsteroidal anti-inflammatory drugs. To treat severe pain, a stronger drug approach that includes opioids may be considered, but only for a short time. Other therapies to be taken into account are spinal manipulation, intensive interdisciplinary rehabilitation, exercise therapy, massage therapy, or progressive relaxation. Spinal surgery is an option in the event of progressive neurological fallout, severe persistent pain of more than three months and patient unresponsiveness to recommended treatment, or if there is acute cauda equina syndrome.

S Afr Fam Pract 2012;54(5):398-403

Introduction

Acute pain is a normal biological response to tissue trauma. Pain impulses are continuously modulated by descending signals with an inhibitory effect on the pain impulse. This descending pathway involves the action of endogenous opioids and various neurotransmitters. Descending pathways are further modulated by the limbic system. This explains why anxious and depressed persons experience pain to a greater intensity. The patient's response to this pain stimulus integrates the physical component of pain with psychological factors, e.g. anxiety and depression, and the social aspect of interpersonal relationships, e.g. the work environment and domestic issues. Emotional factors have a profound effect on pain perception. Depression and anxiety lower the threshold for pain perception.

Management of back pain now encompasses a much broader approach, known as the biopsychosocial model. Emotional and cognitive dimensions may play a minor, but at times a major, role in the pain experience. They can exert an important influence in the progression to chronic pain.

About 70% of the world's population suffers from acute back pain episodes in their lifetime.[1] The yearly prevalence of back pain (acute or chronic) is estimated to be between 15-20%. Two to five per cent seek medical attention or take time off from work. Low back pain (LBP) is a heterogeneous condition featuring multiple aetiologies that can give rise to other pain.

Back pain can be divided into:

- *Acute:* Duration of three weeks (pertinent to this article)
- *Subacute*: Duration of up to three months
- *Chronic:* Duration of more than three months
- *Acute on chronic:* This must be treated as an acute flare of chronic back pain.

The concept of acute adult low back pain

As the aetiology of acute LBP is uncertain, for the initial management, a simple diagnostic approach is recommended:

- LBP is a symptom complex in which pain is localised to the lumbar spine, and where other specific conditions potentially causing such pain have been excluded.
- Nerve root pain or true radiculopathy is pain radiating down one leg to below the knee and often into the calf and toes, and which is characterised by other features

of the lumbar root syndrome. A common mistake is to confuse true radiculopathy with pseudoradiculopathy. In the case of true radiculopathy, there are objective signs of nerve root compromise. Pseudoradiculopathy refers to pain that radiates into the leg, but usually not below the knee, and which is not characterised by any localising signs. The origin is usually referred pain emanating from soft tissues, including muscular trigger points, ligaments, facet joints and myofascial trigger points.

Initial assessment

The natural history of acute LBP in adults is one of spontaneous recovery or significant improvement within three weeks, although full resolution may take up to 12 weeks.[2,3] In 90% of patients presenting with an acute onset of LBP, the precise cause of the back pain cannot be found, although disc herniation is strongly implicated in younger patients with true sciatica. In a small percentage of patients (approximately 2%), serious underlying disease may be present.

During the first visit, the aim and focus of obtaining a medical history and conducting a physical examination should be to identify this small group of patients with a serious underlying disease.

Red flag warnings

Certain key points should not be missed. These are referred to as "red flag" warnings that indicate the possibility of a serious underlying pathology.[4]

When taking the patient's history, look out for the following red flags:

- First onset of back pain < 20 or > 55 years of age
- History of cancer
- Unexplained weight loss
- Immunosuppression
- Constant progressive nonmechanical pain
- History of intravenous drug use, either illicit or recent intravenous drip
- Prolonged steroid usage (past or present)
- Urinary or other infections
- Significant trauma, e.g. a fall on the back or an accident
- Falling or lifting by a potentially osteoporotic or elderly individual
- Walking limitations due to leg pain (claudication-type pain)
- Persistent numbness or weakness in the legs
- Bladder dysfunction (retention or overflow incontinence)
- Saddle anaesthesia of possible cauda equina syndrome
- Systemic disease, e.g. rheumatoid arthritis.

Red flag warnings should be investigated further.[5,6] Assessment of a patient with a red flag warning must exclude fracture, tumour, infection, cauda equina syndrome, and referred pain from vascular, abdominal, urinary and pelvic pathology.

Cauda equina syndrome requires urgent referral to a specialist. The signs are the following:

- Bladder, bowel or sexual dysfunction
- Anaesthesia or paraesthaesia in the perineum or the buttocks.

Yellow flag warnings

"Yellow flag" warnings indicate possible psychological or social factors.[7-9] These may play a role in the patient's response to his or her pain, and may have a profound biasing influence on all aspects of LBP behaviour, including the reporting of it and the patient's response to treatment. Psychological or social factors can contribute to delayed recovery from acute back pain or to progression to a chronic pain pattern, and are a major contributor in chronic pain.

Blue flag warnings

"Blue flag" warnings indicate that occupational factors may play a role in delayed recovery. Specific questioning as to possible work stressors should be included routinely.

The most common blue flag occupational factors are:

- Heavy, unpleasant or dangerous work
- Advanced age
- Low income group
- Job dissatisfaction
- Adversarial job relations
- Higher functional disability
- Higher perceived disability or compensation issues.

Neurological examination

During the physical examination, signs of any underlying serious or possible neurological compromise should be sought. The neurological evaluation can be limited to a few tests, with little likelihood of serious neurological disease being missed.

A comprehensive, but short, neurological examination should cover the following:[10]

- Ankle and knee reflexes
- Ankle and great toe dorsiflexion strength
- Light-touch sensation in the medial, dorsal and lateral aspects of the foot
- Sensation in the S1 area for cauda equina
- Straight leg-raising test
- Hopping on each leg, if pain allows
- Walking on the heels, then the toes.

This short examination will facilitate the detection of most clinically significant nerve root compromise.

The rest of the physical examination should include:

- Abdominal palpation for any masses or aneurysms
- Peripheral pulses
- Urine biochemical analysis, e.g. urine dipstick
- Serology, e.g. full blood count and erythrocyte sedimentation rate if indicated.

Much has been written on examination of the spine.[11] Spinal range of motion is of limited diagnostic value and contributes little to therapeutic choices. Pain radiating to the buttocks or legs with side bending, or a difference of more than 20 degrees in straight leg raising from the left and right side, indicates a longer recovery time. The principal aim of examining the spine is to exclude specific syndromes, e.g. the red flags as mentioned.

Considerable back pain management has focused on the nerve or disc-vertebra complex. Pain emanating from the soft tissue components of the low back is often ignored. An examination of the soft tissues in the lumbar region and buttocks is largely neglected. Marked tenderness on deep palpation of the paravertebral muscles may reveal painful nodules (trigger points), which in themselves can refer pain to the buttocks or upper legs (the so-called pseudoradiculopathy).[12,13] The soft tissue components may be a major factor in producing LBP. These myofascial pain syndromes may closely mimic symptoms from the nerve roots or discs.

Special investigations

In the absence of red flag warnings, neither routine (e.g. X-rays), nor special investigations [e.g. magnetic resonance imaging (MRI)] are required in the first three weeks of managing acute non-specific LBP.[14] These tests contribute to diagnosis or treatment decisions in only 2% of cases in the absence of red flag warnings, and correlate very poorly with the degree of pain felt. Even in those 2% of cases that later prove to have other pathology, in the absence of red flag warnings, waiting three weeks before asking for radiological studies seldom makes any difference to the outcome.

Advanced imaging should be reserved for patients when surgery is being considered, or for those in whom systemic disease is strongly suspected. Many MRI studies have a high prevalence of abnormality in subjects without back pain. Findings of moderate to severe central stenosis, root compression and extrusions may be diagnostically and clinically significant, but are also observed in up to 50% of normal and asymptomatic individuals.[15]

Studies on the natural history of MRI-diagnosed disc abnormalities showed that after five years, psychological factors and physical work characteristics were more powerful than MRI in predicting future pain and work incapacity.

The visual analogue scale

It is useful to have an objective method of recording the amount of pain that the patient has. The visual analogue scale (VAS) is a very easy and practical method to use. Repeat this at follow-up visits to gauge improvement (Figure 1).

No pain ---------- Extreme pain
100 mm scale = % of pain

Figure 1: The visual analogue scale

The three diagnostic categories are simple LBP (90%), serious spinal pathology (8%), and nerve root compromise (2%). Once serious spinal pathology and nerve root pain have been excluded, it can be presumed that the patient is suffering from simple LBP.

Provision of patient information

Provision of patient information is a crucial part of the treatment. At the first visit, patients should be given accurate information on the following:

- The meaning of the term “simple back pain”. This is commonly used and indicates that no serious pathology is involved.
- The natural course of the pain. This entails spontaneous recovery over a month, but it can take up to three months, and at times, six months, to recover fully.
- The safest and most effective method of symptom control.
- Activity modifications, and which activities are safe to undertake.
- Methods of limiting pain recurrence.
- The fact that there is no need for special investigations within the first three weeks (presuming no red flags are present).
- If symptoms persist, the effectiveness and risks of further diagnostic tests.

Many myths and prejudices exist in the minds of patients. Patient dissatisfaction with treatment can stem from lack of communication.

It should be explained that the normal course of acute back pain is spontaneous improvement in 90% of cases, and that it takes time. Explain that some of the well-meaning treatments of the past, like bed rest, may actually slow down the natural healing process and that continuing to move around will do no harm and should be beneficial.[2,16,17]

Symptomatic control

Medication

Adequate suppression of acute pain is very important, and inadequately controlled acute pain is a major cause of chronic pain and delayed recovery.

The World Health Organization (WHO) analgesic ladder, originally developed for cancer pain management, but now widely used for any acute or chronic pain, has been the framework for pain management for a number of years.[18,19]

The cornerstone of this ladder rests on five recommendations:

1. Analgesics should be administered orally, wherever possible.
2. Analgesics should be given at regular definite intervals.
3. Analgesics should be prescribed according to pain intensity.
4. The dosing of medication should be adapted to the individual. The correct dosage is one that will allow adequate pain relief.
5. The patient should be given all the necessary information about when and how to administer the meditation.

Step 1 of the original WHO pain ladder recommends non-opiods, e.g. paracetamol and nonsteroidal anti-inflammatory drugs. If adequate analgesia is not achieved, proceed to step 2, which suggests a weak opioid, e.g. tramadol and codeine, or various combinations. If unsuccessful, follow step 3, which advocates strong opioids and non-opioids.

The pain ladder has now been adapted, as intense pain needs to be controlled much faster with rapid progression to Step 3, but this only applies to patients who are in severe pain. Prescriptions of strong opioids must be time-constrained before moving down the ladder to step 2 or 1.

Muscle relaxants can be considered if muscle spasm plays an important role, but should be a time-contingent prescription only, limited to about five days. A step 4 has now been added and includes consideration of neurosurgical procedures. Most of these are more appropriate for chronic pain management than for acute pain. There is conflicting evidence on the effectiveness of epidural steroids in treating acute nonspecific LBP. Epidural steroids are frequently ineffective in treating acute nonspecific LBP, but may help patients with radicular symptoms.[20]

Physical treatments

Bed rest

Traditionally, bed rest was considered to be therapeutic and for many years was the mainstay of treatment of acute LBP. However, controlled trial results strongly advise against bed rest to treat simple LBP.[21,22]

Patients with severe pain can be treated with a short period of bed rest and mobilised thereafter as soon as possible. The shorter the period of bed rest and the sooner the mobilisation begins, the better the results and the more rapid the return to work. No adverse effects have been reported in patients who were treated by earlier mobilisation, and these patients returned to work earlier.

Reactivation: the role of activity and exercise[23]

In the absence of bed rest, the amount of activity must be managed carefully on an individual basis.

The patient's tolerance to exercise should be ascertained. It is important to see what he or she is capable of doing. Likewise, restrictions should not be placed on anything that can be achieved by the patient, e.g. going to the toilet.

The patient should exercise according to a given target. Each day, a new goal should be set, so that gradually a little more is achieved. As far as possible, within the confines of pain, the patient should continue with his or her normal daily activities. A return to work should be encouraged as soon as it is feasible.

Activities that are known to increase mechanical stress on the spine should be avoided. In particular, lifting, prolonged sitting (particularly in an unsupported chair), and bending or twisting should be prevented.

Returning to work depends on the clinical status of the patient, as well as the nature of the work. A patient with mild back pain and work that is not manual in nature can return to work quickly. However, resuming work for a patient with an occupation that places mechanical stress on the back should be carefully considered. This often necessitates a review of the working conditions. Many factories employ an occupational therapist who if available, should be consulted prior to the patient's return to work. Even temporarily placing the patient in a job with less mechanical strain is preferable to booking him or her off work completely. The longer a person is booked off work, the greater the risk of a chronic pain syndrome developing. Any period off work must be time-limited and reviewed on a regular basis.

Most types of exercise are appropriate, including aerobic activity, movement instruction, muscle strengthening and stretching.[24] Exercise programmes that only place minimal stress on the back, such as walking, bicycle riding (with the handle bars positioned high enough to keep the back straight) and swimming can be started by most patients within two weeks. Simple conditioning exercises for the trunk muscles, especially back extensors, if gradually increased, are helpful. These exercises may initially aggravate the symptoms, before relief should eventually be felt. No evidence exists for involved exercise programmes beyond these simple exercises. Patients must be strongly motivated to continue with their exercise programme.

Spinal manipulation

In the first month of the presentation of symptoms, manipulation without anaesthetic can be effective in hastening the natural recovery period of acute back pain.[25,26]

There is insufficient evidence for and against manipulation in patients with radiculopathy, but anecdotal evidence is in favour of this practice, with many dramatic recoveries having been described. Any exacerbation of symptoms is seen as a contraindication to continuing, hence manipulation should not be attempted, even under general anaesthesia.

Other modalities

- Heating pads: Application of heat by heating pads is a self-care option for short-term relief of acute LBP. There is some evidence that massage may give some relief.
- Spinal traction: There is no objective evidence that spinal traction is of any benefit. There have been a number of reports of aggravation of sciatica following traction, attributable to traction of the nerve root over a bulging disc.
- Physical agents: A review of the extensive literature on other physical agents and modalities including ice, heat, diathermy, ultrasound, cutaneous laser, electrical stimulation and transcutaneous electrical nerve stimulation (TENS), has showed insufficient proven benefit to justify their cost in treating acute back pain.[1,7,24] These are all passive treatments and the basic principle of back pain treatment is to encourage active patient participation.
- Lumbar corsets and back belts: There is little objective evidence that lumbar corsets and back support belts are of use in treating patients during the acute phase of LBP, although the placebo effect appears to be strong in some patients. Many patients with severe degenerative changes of the lumbar spine do feel much better with support, e.g. a corset, and particularly in the subacute phase. There is anecdotal evidence that male patients carrying out work that involves bending feel more comfortable using simple supports, such as a weightlifter's belt.

Patients who are slow to respond

If there has been no improvement by three to four weeks, e.g. on the VAS scale, and the primary care physician has been unable to determine the reason for non-recovery, referral to a specialist should be considered.

If the patient still complains of pain after a month, but has shown some improvement in the VAS score, further investigation is needed. This should include the following:

- A full reassessment of the patient
- A decision on whether further investigations are needed
- A decision on whether surgery is needed
- A review of the history for red flags
- A full physical examination (now required).

Carefully review the course of the pain. The VAS scale is of great value. The patient may complain of pain, but may actually be better than before, when he or she was first seen.

If there has been reasonable improvement, then continue as before. If not, proceed to the next step.

Review the possibilities of yellow flag warnings pertaining to psychosocial factors. Are further investigations needed? If there has been no improvement, simple radiological views of the lumbar spine or MRI can be requested. Is surgery required? Spinal surgery does have a place in the management of acute LBP, but patient selection must be strict. Inappropriate patient selection is a major contributing factor to the catastrophic complication of failed back surgery syndrome.[27]

Surgery should be considered in a patient with continuing sciatica after one month of comprehensive conservative treatment, and provided that the following conditions have been met:

- The sciatica is both severe and disabling.
- There has been no improvement.
- There has been neurological progression.
- There is clinical evidence of nerve root compromise, e.g. on MRI.
- There is evidence of cauda equina syndrome.

Should these criteria not be met, then conservative therapy should be continued.

Case study

A 30-year-old weightlifter followed a warm-up exercise using a 40 kg barbell (very light by his standards). He lowered the barbell by leaning slightly forward and felt a stab of pain in his back, which slowly increased in intensity until late that day, when the pain became excruciating.

He presented at the emergency room of a local hospital, where he was found to be neurologically intact. Plain X-rays were noncontributory. Because of the severity of the pain, an MRI was ordered. This showed a large central herniated disc at the L4/5 lumbar disc level (Figure 2). As a result of the severity of the pain, he was advised to undergo surgical decompression. On being informed that he might have to cease his sport for a prolonged period and might not be able to return to competitive weightlifting, he declined

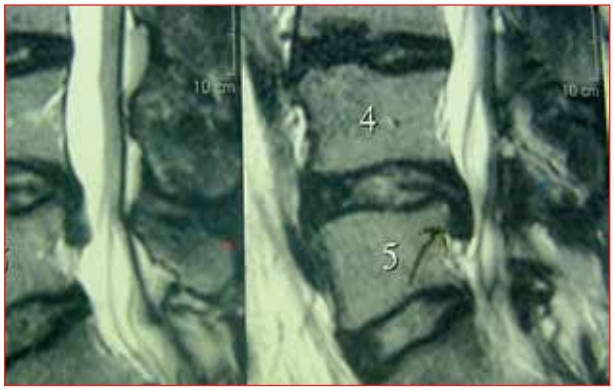

Figure 2: A large central herniated disc at the L4/5 lumbar disc level

surgery and requested a conservative approach instead, for at least a week.

He was managed by being booked off work, initially for 10 days, but was instructed to try and do as much as he could at home. He was warned that he should contact his practitioner if he noticed any change in his bowel or bladder habits. Analgesia was commenced with a five-day script of a strong opioid, dihydrocodeine tartrate tablets 30 mg four hourly, together with diclofenac (Voltaren®, Panamor®) 50 mg three times daily.

He was contacted the next day and every second day thereafter. At the end of the fifth day, he reported being able to move a little easier, but still scored 7 out of 10 on the VAS pain scale. The script was changed from dihydrocodeine tartrate to tramadol with paracetamol.

On the seventh day, he was seen at the consulting rooms where he could move somewhat easier and after a discussion, he elected to try and return to work the following week. His work was an office job, of a sedentary nature. He slowly improved over the ensuing four weeks. The tramadol was stopped, and his pain was reasonably controlled with paracetamol, two tablets taken six hourly. Without our knowledge, he then returned to the gym and started light weight training exercises. Six months later, he had returned to competitive weightlifting.

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