Introduction to the lumbar spine

There is much confusion about the meaning of commonly used words such as backache, sciatica and lumbago. In this book they are defined as follows:

- **Backache**: pain in the lower back, central, unilateral or bilateral with or without radiation to the gluteal region and iliac crest.
- **Lumbago**: acute and severe ‘backache’, causing twinges on attempted movement together with some degree of fixation and/or trunk deviation. The pain reference is wider and sometimes involves the legs in an extrasegmental distribution.
- **Sciatica**: pain in the leg, radiating segmentally to L4, L5, S1 and S2. Pain felt along the anterior aspect of the thigh, as a result of L3 root compression, is not true ‘sciatica’, although patients may describe it as sciatica.

During recent decades, syndromes related to the lower back have been identified by many epidemiological studies. As a result, the incidence of low back pain, and its socioeconomic impact, are well known.1 Low back pain is so common that only a minority of individuals escape it. Eighty percent of the general population will at some time suffer from low back pain and 20% are suffering at any given time.2,3 In Western countries, the 1-year incidence rate for backache is between 24 and 36%.4,6 In the United States, a study of Veteran Affairs outpatients found a 3-year incidence rate of 67%.7 Knepel reported that in general practice every tenth patient had back complaints.8

Backache and sciatica have also become an increasing socio-economic problem in industrialized countries: back disorders account for between 1 and 2% of all working days lost9–13 and for 12.5% of all sickness absence days.14 They are the most common cause of disability among younger adults in the USA.15 The number of working days per year lost because of low back pain is 1400 per 1000 workers in the USA,16 and 2600 per 1000 workers in some British factories.17,18 In the United Kingdom, low back pain was the largest single cause of absence from work in 1988 and 1989 and accounted for 12.5% of all sick days and over £11 billion in direct and indirect costs in 2000.19 The cost of treatment and compensation for low back syndromes is enormous and increases every year. In 1976, in the USA, the total cost of spinal disorders was approximately $14 billion. By 1983, this figure had risen to $20 billion,20 and by 1991 to more than $50 billion21; for 1998, estimates and patterns of direct healthcare expenditures among individuals with back pain in the USA had reached $90.7 billion.22

Backache and sciatica are complaints rather than specific diagnoses. Although most of these symptoms stem directly or indirectly from lesions of the intervertebral discs, it is widely accepted that low back pain spans a group of disorders with varying causes.

As many as 80% of all cases of low back syndromes relate to the lumbar intervertebral discs; the posterior support structures (facets, ligaments, laminae and fasciae) are directly responsible for less than 20% of cases of back disorders.23 The evidence for this statement is derived from anatomical and imaging studies, but Cyriax24 came to the same conclusion almost 50 years ago, purely on careful clinical observations: ‘In my experience lumbar disc lesions are responsible for more continuing – yet avoidable – annoyance, frustration, semi-invalidism, general misery and bad temper than any other tissue in the body. In our view, lumbar disc lesions are responsible for well over 90% of all organic symptoms attributable to the back.’

It is remarkable that, in disorders that affect both individuals and society so much, there is so little agreement about possible pathogenesis and pathological entities. Despite the advanced technology available for diagnosis and treatment, the number of patients suffering from backache and sciatica continues to increase.25 It has even been suggested by both the lay press and professionals that the epidemic increase in disability is partly caused by unnecessary technical investigations and too much surgical treatment.26

The main reason for ineffective diagnosis and treatment is that patients are submitted to technical investigations and tests before careful clinical assessment has been made. A basic
knowledge of anatomy, histology and behaviour of the tissues involved is necessary to be able to understand a patient’s symptoms and to interpret the signs found during the clinical examination. These skills are not widely taught nowadays. Students are trained in the interpretation of discograms, myelograms and magnetic resonance images (MRI), but they do not learn how to take a history and make a clinical examination effectively nor how to interpret the clinical picture that emerges from the findings, how this can be translated into a diagnosis and what is the natural history of the detected disorder.

As for other parts of the body, the information gained from the history and physical examination is the first and most important requisite for correct diagnosis. If the clinical assessment is properly done, technical investigations add little information and scarcely improve diagnostic precision. If clinical assessment is omitted, the results of radiographs, myelograms, discograms, computed tomography (CT) scans and MRI will pose more questions than they solve, simply because these investigations, although very sensitive, are not sufficiently specific to guarantee that the detected lesions are indeed the source of the pain. Indeed, CT investigations have a false-positive rate of 15.5% and a false-negative rate of 40%; MRI has a false-positive rate of 13.2% and a false-negative rate of 35.7%. These rates are far too high for imaging alone to be decisive in the diagnosis of an individual patient’s problem. In spite of this, many surgeons base their decision to carry out surgery solely on the outcome of these investigations.

With a good understanding of the applied anatomy and a clear insight into the way that tissues behave, it is possible to translate the symptoms and signs found during clinical assessment into a deduction about the anatomical changes that have taken place in a patient’s back. The true art of clinical investigation is to organize all the clinical data in such a way that the typical patterns are easily recognized. There are, in fact, only a few symptom patterns and patients’ descriptions are frequently strikingly similar.

The dura mater is the most important pathway by which an intervertebral disc produces pain. It is the link between the macroscopic changes at the posterior aspect of the intervertebral joint and the symptoms: backache or lumbago result when the dural sac is irritated; sciatica occurs when the dural investment around the spinal nerve is pinched. This ‘dural concept’, in which both disc and dura have a particular role, accounts for most of the low back syndromes, and is discussed in the chapter on the dural concept (Ch. 33).

Changes in the disc can also have consequences for the posterior support structures and result in other signs and different findings. We discuss these in the chapter on the ligamentous concept (Ch. 34).

Increasing degeneration of the spine usually remains painless and is, in fact, a normal event which does not signify any particular disease. Sometimes increasing degeneration can account for acquired stenosis of the vertebral canal or the lateral recess. The resulting symptoms and signs are discussed in the chapter on the stenotic concept (Ch. 35).

There are also a number of pain syndromes not related to mechanical problems, such as spondylolisthesis, infectious and rheumatological diseases, and diseases of the osseous structures. These are discussed in the chapter on non-mechanical spinal disorders (Ch. 39).

The treatment administered for lumbago, backache and sciatica depends on the diagnosis, i.e. on the data obtained during history taking and clinical examination. A ‘standard’ treatment for backache does not exist; treatment procedures depend entirely on the underlying disorder. For example, if backache is caused by a small posterior displacement of the intervertebral disc, irritating the dura mater, attempts are made to shift the protruded fragment back into place, either by manipulation or by traction. If this proves impossible, attempts are made to desensitize the dura with an epidural injection. If the protrusion is unstable, and the patient has a history of recurrent back trouble, prophylactic measures against further disc displacements should be taken. If backache is caused by a sprained posterior ligament or an inflamed facet joint, local sclerosing injections or infiltrations with triamcinolone should be used.

Access the complete reference list online at www.orthopaedicmedicineonline.com
References


