

Conservative Back Pain Management in Patients

Rafael*

Department of Anaesthesiology, Consultant Anaesthetist and Intensivist, Santiago de Compostela University, Spain

Abstract

Back pain may arise directly from vertebral fracture or indirectly from the consequences of spinal deformity, secondary degenerative change and disc disease.

Keywords: Spinal Cord; Imaging; Treatment; Acute pain; Patients age

Introduction

In addition to changes to the vertebrae and annular, back pain may also be derived from impact on associated muscles, posterior ligaments and facet joints. Nerve root compression may cause additional pain in the buttocks and legs [1]. Vertebral fractures associated with osteoporosis rarely because spinal cord compression, as this was demonstrated in only a series of older patients admitted with acute vertebral fractures. The manifestation of back pain is variable, as not all patients are affected and some experience more severe pain than others. Relatively little information has been published about the nature of pain associated with vertebral fracture. In a series of patients with acute back pain associated with vertebral fracture, two groups were identified. In the first group, severe pain was associated with obvious vertebral wedging and lasted for four to eight weeks. In the second group, the fracture was not readily apparent initially, but wedging developed over the next few months. Back pain was less severe and shorter-lived, but was followed by a second painful event few weeks later, with this pattern being repeated for months [2]. Imaging in patients with osteoporosis and back pain X-rays remain the main investigation to demonstrate vertebral fractures and may be sufficient in many cases. However some vertebral fractures are difficult to visualise on a plain X-ray, because bone anatomy is complex and there may be no visible break or displacement. In such cases alternative methods of imaging may be appropriate. There is also a risk that pain associated with vertebral fracture may be wrongly attributed to another cause. Furthermore, when a patient with vertebral fracture does not experience a reduction in pain despite appropriate treatment, alternative methods of imaging may help to identify other causes of back pain, such as skeletal metastases [3]. An isotope bone scan is very sensitive, but while refinements of this technique can offer more detailed imaging, isolated uptake of the isotope is not diagnostically specific, because it identifies both pathological and degenerative changes. However, widespread skeletal metastases and sacral stress fractures are associated with characteristic patterns, such as the honda sign in the latter. One of the advantages of isotope bone scanning is that imaging of the whole skeleton can be carried out without additional radiation exposure. It is important to appreciate that osteoporotic vertebral fractures are associated with increased uptake on isotope bone scan, which usually persists for over a year. MRI is capable of imaging bone marrow oedema, which may help to identify early vertebral fractures. Routine spine MRI scan protocols do not include the oedema sensitive STIR sequence and hence may not detect early fractures. It is, therefore, helpful to make imaging staff aware of the suspected diagnosis, so that a STIR sequence is included in the procedure. MRI is considered the most accurate imaging modality overall and offers greater diagnostic confidence than an isotope bone scan. Often the diagnosis of osteoporotic fracture is not suspected

and a patient's back pain raises concern about skeletal metastases. Radiologists must maintain an index of suspicion for osteoporotic fractures to avoid misinterpreting sacral stress fractures as metastases on routine lumbar spine MRI examinations [4]. CT is less useful for providing information about functional defects in bone. It may be a useful problem-solving measure to clarify the diagnosis in the event of uncertainty following an isotope bone scan. Imaging should be carried out at an early stage, because the clinical value of the scan declines as the patient's condition improves.

Discussion

Although open access to all imaging modalities is the ideal, there are currently insufficient resources in the UK and many other countries to meet such demand. Management of back pain Acute pain Although an episode of acute back pain in patients with documented osteoporosis is likely to be due to vertebral fracture, other causes may be excluded by the use of appropriate imaging techniques. Guidelines for the initial management of acute back pain recommend reassurance, physical therapies, non-opioid analgesia and exercise, before referral to secondary care. Analgesics are usually prescribed in accordance with the principles of the World Health Organization. Strong opioids are likely only to be considered where there is severe pain from a vertebral fracture, but the concomitant use of aperients may prevent the development of constipation. Chronic pain Identifying the causes and nature of chronic back pain is a complex process. Pain may be due to factors other than nociceptive input triggered by on-going tissue damage. Neuro-plastic changes are now recognised, with damaged nerves becoming mini-pacemakers, with signals amplified locally and centrally by neural and humeral mechanisms [5]. Pain is more than "an unpleasant sensory sensation", but an emotional experience linked to beliefs, behaviours defined within a social context. The development of chronic back pain after vertebral fracture may be influenced by these physical and behavioural changes. Muscle spasm, guarded movement and fear of increased pain may all lead to physical deconditioning and disability. The main determinants of the development of chronic back pain are psychosocial factors, including low mood, anxiety,

***Corresponding author:** Rafael, Department of Anaesthesiology, Consultant Anaesthetist and Intensivist, Santiago de Compostela University, Spain, Tel: 09913461815, E-mail: r.bdavila@gmail.com

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catastrophic coping, poor physical health, previous physical abuse and passive coping. This provides the rationale for using a bio-psychosocial model in the management of chronic pain [6]. Treatment should aim to reduce pain intensity, anxiety, emotional overlay and depression. Other objectives include reducing disability, improving sleep, optimising social function and supporting family members. Patients' confidence in medical care may be reduced if osteoporosis is offered as an explanation of the cause of pain, without demonstration of fracture or other skeletal deformity. Furthermore, if patients perceive that they have a weak spine, they may develop avoidance behaviours that become maladaptive, leading to disuse and disability. The effectiveness of options for the long-term management of chronic back pain is summarised in Table The choice of drug treatment depends on the nature of the pain and the patient's age, physical and mental health, with options including NSAIDs and centrally-acting agents, such as amitriptyline. There is also evidence that long-term treatment with a strong opioid is safe and effective. Approaches to the management of back pain in osteoporosis, Few studies have explored the impact of pain and its management on the life of women with osteoporosis. A study of postmenopausal women with vertebral fracture suggested that constant pain, coping with pain treatment and the perceived lack of control had a severe impact on the women's ability to perform daily activities [7]. The authors suggested that intervention programmes incorporating education, pain management and techniques to reduce stress and isolation may increase self-care ability in these women. The association between new vertebral fractures, back pain and functional limitations was explored in another study, which indicated that time after fracture is an important determinant of quality of life. The authors suggested that the teaching of coping strategies is an important measure in the management of osteoporotic pain. The need for psychological support with respect to pain control has also been highlighted in other studies. A small pilot study suggested that participating in an OPP helped patients to express their individual pain experiences, led to an improved understanding of their condition, reduced the intensity of pain and created greater levels of self-efficacy. Further research is needed to evaluate the effect of a structured pain programme as an integral part of the management of back pain in patients with osteoporosis [8, 9]. Osteoporosis treatments in patients with vertebral fractures and back pain Treatments such as hormone replacement therapy, raloxifene, bisphosphonates, strontium ranelate, teriparatide and calcitonin may decrease back pain by reducing the risk of vertebral fractures, but calcitonin, intravenous bisphosphonates, teriparatide and alfacalcidol, may also have a direct effect on bone pain in patients with vertebral fractures. Calcitonin Calcitonin has been used to treat bone pain associated with acute vertebral fracture, Paget's disease of bone, skeletal malignancy and other pain of musculoskeletal origin. In two small randomised double-blind placebo-controlled trials, calcitonin significantly relieved pain and improved early mobility in patients admitted with vertebral crush fracture. A recent systematic review identified five randomised double-blind placebo-controlled trials involving a total of patients with acute pain due to recent osteoporotic vertebral fracture. Calcitonin significantly reduced pain, with onset of effect in the first Injury Pain Guarded movement

and muscle spasm Reduced physical activity Fear-avoidance Physical deconditioning Decreased participation Depression/ Learned Helplessness Treatment failure Misattributions Frustration, anxiety, anger. Adapted from Spanswick and Main week and continuing for at least four weeks, improvement occurred in pain scores at rest, sitting, standing and walking. Adverse effects, which predominantly involved the gastrointestinal system, were considered minor and self-limiting. Other analgesic mechanisms for agents influencing the bones are becoming increasingly apparent [10].

Conclusion

In animals and humans, similarities have been reported between calcitonin and morphine-induced analgesia, with elevation of plasma beta-endorphin levels, suggesting possible involvements of Evidence for the effectiveness of interventions for back pain in general Intervention Evidence of benefit References/Comments Acupuncture Trials with greater validity were more likely to have negative outcomes Systematic review of randomised controlled trials Acupuncture superior to control interventions, but insufficient evidence of superiority over placebo Meta-analysis of randomised controlled trials.

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Conflict of Interest

None

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