Nonoperative Management of Low Back Pain and Lumbar Disc Degeneration

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THESE AUTHORS NOTE:

Low back pain is often a difficult problem to solve.

"There is a paucity of evidence from the health professional literature regarding its cause, management, and prognosis."

"The difficulty of managing patients with low back pain stems from the fact that there often is very little association between any pathological physical findings and the patient's pain and disability."

"The professional must then find ways of clinically treating a syndrome that betrays the principles of basic science." **[IMPORTANT]**

This lecture will review some of the available nonoperative modes of low back pain treatment, which can be applied regardless of whether a particular pain mediator has been identified.

EPIDEMIOLOGY AND NATURAL HISTORY

Low back pain is epidemic in the United States, with an annual incidence of 5% per year, and an associated prevalence of 60% to 90%.

"The one-month prevalence of low back pain is estimated to be 43% of the population."

"Only visits for the common cold have outnumbered presentations of low back pain to primary care physicians."

"The length of time that a patient is absent from work because of low back pain correlates with a decreasing chance of return to work."

"A patient who has missed work for more than six months has a 50% chance of returning to work, one who has missed more than a year has a 25% chance of returning, and one who has missed two years or more has a <5% chance of returning."

Low back pain is the leading cause of disability in persons younger than forty-five years of age."

Between $33 - $55 billion is spent yearly in direct medical costs for the treatment of low back pain.

The indirect costs such as lost work-days and productivity have been estimated to be $90 billion.

Most studies have suggested that low back pain is usually a self-limited disease, with dramatic improvement in up to 80% of people in the first two weeks.

85% of low back conditions cannot be diagnosed with history, physical examination findings, or diagnostic testing. **[IMPORTANT]**

"There is an increased incidence of both low back pain and disc herniations in smokers."

There is a threefold higher risk of lumbar disc herniations and a 3.9-fold higher risk of cervical disc herniations in smokers."

Nicotine interferes with bone disc metabolism.

In smokers, disc nutrition is impaired with progressive disc degeneration.

Oxygen levels are reduced in smokers, leading to hyalinization and necrosis of the nucleus pulposus.

"Outcomes of treatment, operative or nonoperative, are less successful in patients who smoke than they are in those who do not smoke."

Smokers have progressive osteoporosis and surgical healing rates are lower.

"Cessation of smoking is an important aspect of the treatment of patients with low back pain."

CLINICAL PRESENTATION

"Low back pain with radiation to one or both buttocks and posterior aspects of the thighs in combination with exacerbation while coughing or sneezing is suggestive of lumbar disc disease."

"A positive straight-leg-raise test or a decreased Achilles reflex is a characteristic finding associated with disc herniation."

"Radicular sensory deficits, unilateral pain, and tension signs with or without reflex alterations all suggest nerve root impingement."

"Pain with standing that improves with short walks and pain with back flexion and with no substantial muscle tenderness suggest a discogenic etiology."

"Focal night pain without associated tenderness may be consistent with a tumor."

Obesity contributes to low back pain.

"Repetitive bending and twisting can increase the risk of low back pain and disc herniation."

Non-musculoskeletal causes of low back pain include kidney stones or and abdominal aortic aneurysm.

"Tenderness and pain with percussion over the dorsal twelfth rib region, lateral to the midline, suggest kidney involvement."

Tumors may manifest as back pain, presenting as pain at night without response to activity or rest, unexplained weight loss, and fatigue.

IMAGING

Anteroposterior and lateral plain radiographs of the lumbar spine are useful for the evaluation of osseous anatomy and alignment.
[Great Words]

Computed tomography is helpful for the assessment of fractures and spondylolysis.

Magnetic resonance imaging is the "most accurate and sensitive modality for the diagnosis of subtle spinal pathology, making it the test of choice."

"Bone scanning with SPECT (single photon emission computed tomography) allows physiologic assessment of bone by identifying increased osteoblastic activity. It is a highly sensitive study with a low specificity, making it a good screening test for degenerative changes or metastatic disease."

"Discography is an invasive, provocative, painful procedure done under fluoroscopic guidance. Contrast medium is injected to pressurize the disc and mimic the pressure of prolonged sitting or standing." Fissuring and leakage of the contrast medium is seen, but the patient's pain response is the most important determinant of the result.

Discography is the best study for identifying disc pain.

TREATMENT OPTIONS

"The best strategy for nonoperative management of low back pain combines active intervention with education and rehabilitation."

Bed rest should be short-term (two days) if used at all.

MEDICATIONS

"Although no analgesic should be promoted as a cure for pain or a replacement for non-pharmacological interventions, medications are frequently used in the nonoperative care of low back pain."

Nonsteroidal anti-inflammatory drugs limit inflammation by "interfering with prostaglandin synthesis and cyclooxygenase (COX) activity." "Dyspepsia is common, and complications such as gastric erosion, ulceration, and hemorrhage can develop."
"Other risks, such as renal toxicity, are associated with COX-1 and COX-2-regulating nonsteroidal anti-inflammatory drugs."

"Acetaminophen and opioids are commonly used analgesics but they are associated with substantial risks." Hepatotoxicity is a risk with overdosing of acetaminophen.

"Although opioid use is on the rise and can be effective for symptom control, these drugs do not work over the long term and they can lead to other problems. They often have side effects including drowsiness, dizziness, fatigue, nausea, respiratory depression, and constipation."
"Tolerance to the analgesic effect of opioids begins to occur when the drugs have been continuously used for longer than several weeks."

"Opioids produce analgesia by binding to receptors that are normally bound by endogenous compounds in the central nervous system."

"All narcotics are best avoided if possible."

"Steroids should play a minimal role in the treatment of low back pain. They are associated with substantial gastrointestinal risks. Long-term use is known to lead to osteopenia and an increased risk of infection. Concerns about osteonecrosis of the proximal part of the femur and humerus should prompt judicious use."

"Muscle relaxants work for only a limited period of time and should be considered for the acute treatment of back pain rather than for long-term treatment."

"Muscle relaxants and opioids should be avoided by patients with chronic pain."

PHYSICAL THERAPY

"Physical therapy can be used as a broad term to refer to stretching and strength training, back school for the education of patients, and other modalities to address low back pain. It has been shown to be better than medical care alone over a six-month period."

It is unclear whether one form of exercise therapy is more effective than any other.

Massage decreases symptoms and improves function in patients with nonspecific low back pain, especially when the massage was coupled with exercise and education.

Transcutaneous electrical nerve stimulation (TENS) is no better than placebo.

Lumbar traction distracts the lumbar vertebrae, enlarges the intervertebral foramen, creates a vacuum to reduce herniated discs, puts tension on the posterior longitudinal ligament which aids in reduction of herniated discs, and frees adherent nerve roots.

Intradiscal pressure can be decreased by 20% to 30% with traction, but traction does change the natural history of back pain.

CHIROPRACTIC MANIPULATION

"Chiropractic manipulation is the most common 'alternative' therapy for managing low back pain."

"It has been estimated that nearly 15% of the United States population seeks chiropractic help each year."

"Chiropractic manipulation and physical therapy have equivalent success in the management of acute low back pain, and both are better than medical care alone."

"There is no evidence to support the use of long-term manipulation for the treatment of chronic back pain." **[Bummer]**

Vertebral body fracture and spondylolysis with spondylolisthesis as well as the need for postoperative support are all possible indications for prescribing an orthosis.

"There is no evidence in the literature to support long-term use of orthotics for the treatment of low back pain."

"Orthoses do not appear to change the natural history of low back pain."

The sacroiliac joint is not the source of the pain in the majority of low back pain patients.

"Facet or zygapophyseal joints can be generators of low back pain with referred buttock and lower-limb pain."

"The patient's history, physical examination, and imaging studies have each been shown to be unreliable when used alone for the diagnosis of symptomatic facet joints."

"Computed tomography scans of the lumbar spines of asymptomatic individuals over the age of forty years frequently show degenerative changes of the facet joints, so such studies alone are not diagnostic."

"Extension-based back pain, as opposed to worse pain with flexion, along with radiographic evidence of arthropathy suggests the presence of facet-mediated pain."

Relief of back pain with selective blockade of the medial branch of the posterior rami nerve or facet joint injection is used to diagnose painful facet joints.

Long relief of facet pain may be afforded by radiofrequency dorsal rhizotomy, which denervates the facet joint by the localized insertion of a probe that destroys the afferent fibers with a radiofrequency current."

"Intradiscal electrothermal therapy has become popular in recent years for the treatment of low back pain thought to be of discogenic origin," from internal disc derangements. "The procedure involves the posterolateral placement of a probe around the inner circumference of the anulus followed by heating of the probe." It is performed for patients who are not ideal surgical candidates.

OVERVIEW

"Acute back pain is generally a self-limited process that is likely to get better in the short term no matter what treatment is undertaken."

"Chronic low back pain is far more difficult to treat or even to define in terms of etiology."

"A specific treatment program must be customized to the patient's specific findings, and all patients must be active participants in their return to health and activity."

KEY POINTS FROM DAN MURPHY

1) Through today, low back pain is often difficult to solve; the literature on its cause, management, and prognosis is scant; there is little association between pathological physical findings and the patient's pain and disability.

2) 43% of the US population experience LBP in a give month.

3) Low back pain is second only to the common cold in visits to primary care physicians.

4) The longer a patient is off work with low back pain, the higher the chances that he/she will never return to work. {I believe that one of our primary goals of treating these patients is to get them to return to work as soon as possible.

5) Low back pain is the leading cause of disability in persons younger than 45.

6) Direct costs of treating LBP is $33 - $55 billion per year, and indirect costs are $90 billion.

7) Low back pain is usually a self-limited disease, with dramatic improvement in up to 80% of people in the first two weeks.

8) 85% of low back conditions cannot be diagnosed with history, physical examination findings, or diagnostic testing.

9) Smokers have more incidences of back pain, more disc herniations, progressive disc degeneration, poor treatment outcomes, and poor healing.

10) Low back pain with radiation to one or both buttocks and posterior aspects of the thighs in combination with exacerbation while coughing or sneezing is suggestive of lumbar disc disease.

11) A positive straight-leg-raise test or a decreased Achilles reflex is a characteristic finding associated with disc herniation.

12) Radicular sensory deficits, unilateral pain, and tension signs with or without reflex alterations all suggest nerve root impingement.

13) Pain with standing that improves with short walks and pain with back flexion and with no substantial muscle tenderness suggest a discogenic etiology.

14) Obesity contributes to low back pain.

15) Repetitive bending and twisting can increase the risk of low back pain and disc herniation.

16) Non-musculoskeletal causes of low back pain include kidney stones or and abdominal aortic aneurysm.

17) Tenderness and pain with percussion over the dorsal twelfth rib region, lateral to the midline, suggest kidney involvement.

18) Tumors may manifest as back pain, presenting as pain at night without response to activity or rest, unexplained weight loss, and fatigue.

19) Anteroposterior and lateral plain radiographs of the lumbar spine are useful for the evaluation of osseous anatomy and alignment.

20) Computed tomography is helpful for the assessment of fractures and spondylolysis.

21) Magnetic resonance imaging is the "most accurate and sensitive modality for the diagnosis of subtle spinal pathology, making it the test of choice."

22) Bone scanning with SPECT (single photon emission computed tomography) allows physiologic assessment of bone by identifying increased osteoblastic activity, making it a good screening test for degenerative changes or metastatic disease.

23) Discography is an invasive and painful, and is the best study for identifying disc pain.

24) Bed rest for more than 2 days is a bad idea in the treatment of low back pain.

25) Nonsteroidal anti-inflammatory drugs cause gastric erosion, ulceration, and hemorrhage, and renal toxicity.

26) Acetaminophen [Tylenol] is associated with hepatotoxicity.

27) Opioid drugs do not work over the long term and they can lead to drowsiness, dizziness, fatigue, nausea, respiratory depression, and constipation. They are addictive and have reduced effectiveness [tolerance] when used for more than several weeks.

28) All narcotics should be avoided in the management of back pain.

29) Steroids are associated with substantial gastrointestinal injury, osteopenia, an increased risk of infection, and osteonecrosis of the proximal part of the femur and humerus.

30) Muscle relaxants work for only for acute of back pain.

31) Muscle relaxants and opioids should be avoided by patients with chronic pain.

32) Stretching and strength training is better than medical care for back pain.

33) Massage decreases symptoms and improves function in patients with back pain, especially when coupled with exercise and education.

34) Transcutaneous electrical nerve stimulation (TENS) is no better than placebo.

35) Lumbar traction distracts the lumbar vertebrae, enlarges the intervertebral foramen, creates a vacuum to reduce herniated discs, puts tension on the posterior longitudinal ligament that aids in reduction of herniated discs, and frees adherent nerve roots.

36) Chiropractic manipulation is the most common 'alternative' therapy for low back pain.

37) 15% of the United States population seeks chiropractic help each year.

38) Chiropractic manipulation is better than medical care for back pain.

39) Vertebral body fracture and spondylolysis with spondylolisthesis often require bracing.

40) The sacroiliac joint is not the source of the pain in the majority of low back pain patients.

41) The facet joints can generate of low back pain with referred buttock and lower-limb pain.

42) Patient history, physical examination, and imaging studies are unreliable to diagnosis symptomatic facet joints.

43) Computed tomography of the lumbar spines of asymptomatic individuals over the age of forty often shows degenerative changes of the facet joints.

44) Facet back pain is often worse with extension.

45) Anesthetic blocks of the medial branch of the posterior rami or facet joint injection is used to diagnose painful facet joints.

46) Longer relief of facet pain is obtained by radiofrequency dorsal rhizotomy, which denervates the facet joint by the localized insertion of a probe that destroys the afferent fibers with a radiofrequency current.

47) Intradiscal electrothermal [IDET] therapy can successfully help discogenic low back pain.