Review: evidence for the effectiveness of non-surgical interventions for low back pain and radiculopathy is limited

QUESTION

Are non-surgical treatments effective for low back pain and radiculopathy?

REVIEW SCOPE

Included studies evaluated target injections or other non-surgical treatments in patients >18 years of age who had low (lumbar or sacral) back pain. Studies reported ⩾1 of the following outcomes: back-specific function, general health status, pain, work disability, and patient satisfaction. Exclusion criteria included pregnancy and low back pain associated with acute major trauma, cancer, infection, cauda equina syndrome, fibromyalgia, spondyloarthropathy, osteoporosis, and vertebral compression fracture.

REVIEW METHODS

Medline, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews (all to Jul 2008) and reference lists were searched for randomised controlled trials (RCTs) published in English or included in English-language systematic reviews, and English-language systematic reviews published after 1999. Experts were contacted. 97 RCTs, including 75 reported in 26 systematic reviews, met the inclusion criteria.

MAIN RESULTS

The main results are in the table.

CONCLUSION

Evidence supporting the effectiveness of non-surgical interventions for low back pain and radiculopathy is limited.

Abstract and commentary also appear in *ACP Journal Club.*

ABSTRACTED FROM

Chou R, Atlas SJ, Stanos SP, *et al.* Nonsurgical interventional therapies for low back pain: a review of the evidence for an American Pain Society clinical practice guideline. *Spine* 2009;**34**:1078–93.

Correspondence to: Dr R Chou, Oregon Health and Science University, Portland, OR, USA; chour@ohsu.edu

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► **Clinical Impact Ratings:** GP/FP/Primary care 6/7; Neurology 6/7; Occupational and environmental health 6/7; Anaesthesiology 6/7; Physical medicine and rehabilitation 5/7; Rheumatology 5/7; Surgery – Orthopaedics 5/7

Non-surgical interventions for low back pain*

Intervention	Selected findings†
Local injection	*Subacute/chronic pain*. Local anaesthetic was better than placebo at 2 weeks in 3 RCTs (2 lower quality) but did not differ from dry needle stick or acupressure in 1 RCT.
Prolotherapy	*Chronic non-specific pain*. Prolotherapy and saline or local anaesthetic did not differ for pain and disability at ⩽24 months in 3 (1 lower quality) of 4 RCTs.
Epidural steroid injection	*Pain with radiculopathy*. Epidural steroid was better than non-epidural placebo in 5 of 6 RCTs (2 of 3 lower quality) and epidural placebo in 2 of 11 RCTs (1 of 7 lower quality) for pain/function at ⩽1 month; epidural steroid was no better than placebo at >3 months in 11 of 17 RCTs (5 of 8 lower quality).
Chemonucleolysis	*Lumbar disc prolapse*. Chemonucleolysis was better than placebo for treatment success in 4 (1 lower quality) of 5 RCTs.
FJSI or medial branch block	*Chronic pain*. FJSI was better than saline at 6 months but not earlier in 1 RCT; treatments did not differ in 1 lower-quality RCT. FJSI and medial branch block did not differ in 2 RCTs (1 lower quality).
Intradiscal steroid injection	*Degenerative disc disease*. Intradiscal steroids did not improve pain/function when added to discography in 1 lower-quality RCT or compared with saline or local anaesthetic in responders to discography in 2 RCTs (1 lower quality). *Back pain with sciatica*: Intradiscal steroids and chemonucleolysis did not differ in 3 RCTs (2 lower quality).
Radiofrequency denervation	*Presumed facet joint pain*. Inconsistent results. Radiofrequency denervation was better than sham treatment for some measures of pain at 4 weeks to 12 months in 4 (1 lower quality) of 5 RCTs.
IDET	*Chronic pain*. Inconsistent results. IDET was better than sham IDET on some measures of pain in responders to discography in 1 of 2 RCTs.
PIRFT	*Presumed discogenic pain*. PIRFT and sham PIRFT did not differ for pain relief or treatment success in 1 RCT; PIRFT of lower or higher intensity resulted in minimal improvement in 1 RCT.
SCS	*Failed back surgery syndrome and persistent radiculopathy*. SCS was better for pain relief than reoperation at 2.9 years in 1 RCT or conventional medical management at 6 months in 1 RCT.

*FJSI, facet joint steroid injection; IDET, intradiscal electrothermal therapy; PIRFT, percutaneous intradiscal radiofrequency thermocoagulation; RCT, randomised controlled trial; SCS, spinal cord stimulation.
†Trials were rated high quality (⩾6 of 11 criteria) unless otherwise noted.

COMMENTARY

Chronic low back pain is recognised as an increasing medical challenge and, as discussed by Chou *et al*, primary care physicians are often inadequately prepared for managing the condition.[1] But is there an even more fundamental problem? Does diagnosis of low back pain imply failure to identify its aetiology? In fact, the cause of low back pain is sometimes murky. We know, for example, that vertebral body osteophytes are not a source of back pain unless they are pressing on a nerve,[2] and even if there appears to be nerve root impingement, the diagnosis is not always clear. Also, the referred pain patterns of fibromyalgia may mimic those of nerve root impingement.[3] It is important to note that Chou *et al* excluded studies of what are probably the major diagnosable sources of back pain (ie, osteoporosis, vertebral fracture, fibromyalgia, and postural abnormalities). In my experience, adequately trained, educated, and experienced physicians can usually identify the aetiology of back pain.

Accurate diagnosis is essential, and it is recognised that treatments might differ depending on the aetiology of a particular pattern of back pain. Light back extension exercise programmes and avoidance of flexion activities[1] usually result in major reductions of pain related to inflammatory back disease, while aggravation of symptoms by extension activities would suggest facet disease; however, even that differentiation is not absolute.[3]

It is surprising that Chou *et al* considered a >20% change on visual analogue pain scales to be a large improvement; many would consider <30% change to be a failure. A major challenge in assessing therapeutic efficacy is the invasiveness of some techniques and failure to use, or the ethical inappropriateness of, sham techniques. Thus, it is difficult to reliably establish efficacy of the very remunerative epidural and facet joint injections even if placebo effects of the procedures are ignored.

Commentary continued on next page

Review: evidence for the effectiveness of surgery for low back pain, radiculopathy, and spinal stenosis is limited

QUESTION

Is surgery effective for low back pain, radiculopathy, and symptomatic spinal stenosis?

REVIEW SCOPE

Included studies evaluated surgery as treatment for non-radicular low back pain with common degenerative changes, radiculopathy with herniated lumbar disc, or symptomatic spinal stenosis in patients >18 years of age who had low back pain. Studies reported ⩾1 of the following outcomes: back-specific function, general health status, pain, work disability, and patient satisfaction. Exclusion criteria included pregnancy and low back pain associated with acute major trauma, cancer, infection, cauda equina syndrome, osteoporosis, and vertebral compression fracture.

REVIEW METHODS

Medline, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews (all to Jul 2008) and reference lists were searched for randomised controlled trials (RCTs) published in English or included in English-language systematic reviews, and English-language systematic reviews published after 1999. Experts were contacted. 74 RCTs, including 62 reported in 22 systematic reviews, met the inclusion criteria: 20 RCTs (n = 2669) involved non-radicular back pain with common degenerative changes; 35 {n = 4732}* involved radiculopathy with herniated lumbar disc; and 19 {n = 1994}* involved spinal stenosis with or without degenerative spondylolisthesis.

MAIN RESULTS

The main results are in the table.

CONCLUSIONS

Discectomy is better than non-surgical therapy for short-term but not long-term relief of radiculopathy. Evidence for the effectiveness of other types of surgery is limited.

*Information provided by author.
Abstract and commentary also appear in *ACP Journal Club*.

ABSTRACTED FROM

Chou R, Baisden J, Carragee EJ, *et al*. Surgery for low back pain: a review of the evidence for an American Pain Society clinical practice guideline. *Spine* 2009;**34**:1094–109.

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Selected surgical interventions for low back pain, radiculopathy, or spinal stenosis*

Patients	Comparison	Number of trials (n); follow-up	Findings†
Non-radicular back pain with common degenerative changes	Fusion *v* non-surgical therapy	4 (767); 1–2 years	Fusion was better than non-intensive supervised physical therapy for pain and function (1 RCT) but not clinically (1 RCT) or statistically (2 RCTs) better than intensive rehabilitation with cognitive-behavioural therapy.
	Fusion *v* artificial disc replacement	2 (596); 2 years	CHARITÉ artificial disc was non-inferior to anterior lumbar interbody fusion (1 RCT), and Prodisc II was better than instrumented circumferential fusion (1 lower-quality RCT) for composite outcomes; results for individual outcomes were inconsistent.
Radiculopathy with prolapsed lumbar disc	Discectomy *v* non-surgical therapy	4 (968); 2–10 years	Open discectomy was better at {1 year}‡ but not 4 or 10 years (1 lower-quality RCT); microdiscectomy was better at 8 weeks (1 RCT) but not 2 years (2 RCTs); open discectomy or microdiscectomy was better for function and disability at 3 months but not 2 years (1 RCT).
Symptomatic spinal stenosis	Laminectomy *v* non-surgical therapy	4 (718); 2–10 years	Laminectomy was better for some pain measures up to 2 years (2 RCTs) and at 4 years but not 1 or 10 years (1 RCT); treatments did not differ in 1 RCT.
	Interspinous spacer *v* non-surgical therapy	2 (275); 2 years	Interspinous spacer was better for overall success at 2 years (2 RCTs, 1 lower-quality). Results for subsequent laminectomy were inconsistent (6% *v* 22% in 1 lower-quality RCT, 12% *v* 12% in 1 high-quality RCT).

*RCT, randomised controlled trial.
†Trials were rated high quality (> 4 of 9 or > 5 of 10 criteria) unless otherwise noted.
‡Data confirmed by author.

COMMENTARY

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Chou *et al* found that the results of surgical studies were inconsistent (even without considering placebo effects). They did not adequately address potential contributions of physical therapy in those studies, although they appropriately emphasise surgical complications. They note problems with intention-to-treat analyses in this setting, appropriately challenging their statistical and clinical validity. As almost 50% of patients did not adhere to assigned treatments in 2 large studies comparing laminectomy with non-surgical treatment, one wonders why these protocol violations were not considered sufficiently important to preclude publication, especially in a prestigious medical journal.[4 5]

The major issue in studies of back pain treatment appears to be lack of significant long-term benefits (even at the 20% level) and some side effects of these approaches. Chou *et al* examined treatment modalities that are typically well-reimbursed rather than those that are not, such as education of patients in home exercise programmes. Their analysis of surgical studies found that intensive rehabilitation with cognitive-behavioural therapy was of equal value to fusion surgery for chronic non-radicular low back pain.

Bruce Rothschild, MD
Northeastern Ohio Universities College of Medicine
Rootstown, Ohio, USA

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