Conservative treatment of acute and chronic nonspecific low back pain: a systematic review of randomized controlled trials of the most common interventions

van Tulder M W, Koes B W, Bouter L M

Authors' objectives
To assess the effectiveness of the most common conservative types of treatment for patients with acute and chronic nonspecific lower-back pain (LBP).

Searching
MEDLINE was searched from 1966 to September 1995, EMBASE from 1980 to September 1995, and PsycLIT from 1984 to September 1995; the search terms were provided. The bibliographies of identified studies were examined. Only English language publications were selected.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), published as full reports, were included. Unpublished studies, and those with quasi-randomisation procedures, were excluded.

Specific interventions included in the review
Bed rest, orthoses, exercise therapy, back schools, spinal manipulation, analgesics, non-steroidal anti-inflammatory drugs (NSAIDS), muscle relaxants, antidepressants, epidural steroid injections, transcutaneous electrical nerve stimulation (TENS), traction, behavioural therapy, electromyographic biofeedback and acupuncture. Control treatments varied between studies, and included placebo for some evaluations.

Participants included in the review
Patients with acute (LBP of 6 weeks' or less duration), subacute (duration 6 to 12 weeks) or chronic LBP (duration 12 weeks or more). People with cervical back pain, or a combination of thoracolumbar and cervical back pain, were excluded unless the results for thoracolumbar back pain were presented separately. Surgical patients were also excluded.

Outcomes assessed in the review
Pain, functional status and overall improvement were assessed.

How were decisions on the relevance of primary studies made?
The titles and abstracts of studies were examined. The process of decision making was not described, i.e whether independent assessment of material was carried out by more than one reviewer, and methods used for resolving disagreements.

Assessment of study quality
Each study was assessed on study population (homogeneity, baseline comparability, randomisation, drop-outs), interventions (standardisation, description, controls, avoidance of cointerventions, placebo-controlled), effect (blinding of patients and assessors, relevance of outcome measures, follow-up), data presentation and analysis (intention to treat analysis, frequencies of important outcomes) and compliance (drug trials only). Each criterion was weighted and each study could score a potential maximum of 100 points, with higher scores indicating higher methodological quality. Studies were also attributed one of four ratings for level of evidence (strong, moderate, limited, none), dependent upon quality and outcome, according to US Clinical Practice Guideline for Acute Low Back Problems in Adults.
Assessment was performed by two independent reviewers, who were not blinded to source or outcome of trials. Any disagreements were resolved through discussion or recourse to a third reviewer.
Data extraction
Data were extracted relating to the outcomes of pain, functional status and overall improvement. A study was considered to have a positive result if the experimental intervention was more effective compared with control for at least one of these outcomes. Studies were considered to have negative results if there were no differences between groups on any of the outcomes, or if the control treatment proved to be more effective for at least one of the outcomes. If the experimental intervention was more effective for one outcome measure, but less effective for another, or if these outcome measures were not assessed, the study was categorised as 'no conclusion'. No information was provided on the process by which data were extracted, i.e. whether done independently by more than one reviewer.

Methods of synthesis
How were the studies combined?
The studies were combined by a narrative summary and tabulation.

How were differences between studies investigated?
Distinction was made between studies of high methodological quality (50 points or more) and low quality (less than 50 points).

Results of the review
Overall, 150 RCTs were included. Of these, 68 recruited people with acute LBP, 81 were chronic LBP and one RCT included participants with both acute and chronic LBP. Numbers recruited to individual studies are not given in all cases, but it appears that at least 10,000 participants were included in this review.

Overall, the methodological quality of included studies was low, but the methodological quality of drug trials was generally higher compared with trials of other conservative treatments.

Interventions for acute LBP:
There is moderate evidence that analgesics are equivalent to NSAIDS, but no evidence that analgesics are more effective than electroacupuncture or ultrasound. There is strong evidence to show that NSAIDS are more effective than placebo for non-sciatic LBP, that NSAIDS are equivalent to analgesics and that various types of NSAIDS are equivalent to each other. There is strong evidence that muscle relaxants are more effective than placebo, and that different types of muscle relaxants are equivalent to each other. Bed rest is not effective. Exercise therapy is no more effective than other conservative treatments. There were contradictory results for the effectiveness of back school. There was limited evidence that manipulation and traction were more effective than placebo. There was limited evidence that epidural steroid injections were more effective compared with subcutaneous injections of lignocaine. There was no evidence to show that TENS or behaviour therapy were more effective than other conservative treatments.

Interventions for Chronic LBP:
In terms of analgesics, paracetamol is equivalent to diflunisal. Muscle relaxants show a positive result when compared with placebo. Antidepressants proved to be no more effective than placebo. There is moderate evidence for the effectiveness of NSAIDS. Epidural steroid injections proved to be more effective than placebo, but results of comparisons with injections of local anaesthetic or muscle relaxant were contradictory. Manipulation is more effective than placebo, usual general practitioner (GP) care, bed rest, analgesics and massage. Back school in an occupational setting may be more effective than no treatment, but it is unclear whether back school is more effective than other conservative treatments. Electromyographic biofeedback is no more effective than waiting list, placebo or other conservative treatments. Exercise therapy appears to be more effective than other conservative treatments, but no specific type of exercise proved to be more effective than another. No significant differences were observed between 2 different types of traction. For orthoses, there were no significant differences for corsets, with or without lumbar support. Behavioural therapy may be more effective compared with waiting list or other types of conservative treatment. However, no one type of behavioural therapy emerges as being superior to others. TENS does not appear to be any more effective compared with waiting list, placebo or other conservative treatments. There is no evidence to show that acupuncture is more effective compared with placebo, waiting list controls or other conservative treatments.
Authors' conclusions
Many therapeutic interventions are available for, and used in the treatment of, acute and chronic LBP. The quality of
the design, execution and reporting of RCTs should be improved to establish strong evidence for the effectiveness of
the various therapeutic interventions for acute and chronic LBP.

CRD commentary
Study selection, quality assessment, presentation of primary material and combining of data are all well conducted in
this review. The search strategy includes only published English language studies, and there is no mention of accessing
databases specialising in complementary medicine, which may mean that relevant material has been missed. There is
limited information on the processes of data extraction and decisions for including or excluding studies. This review is
an update of an earlier review.

Implications of the review for practice and research
The quality of the design, execution and reporting of RCTs should be improved to establish strong evidence for the
effectiveness of the various therapeutic interventions for acute and chronic LBP.

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Other publications of related interest
Assendelft WJJ, Heijden GJ van der, Bouter LM, Knipschild PG. Spinal manipulation and mobilization for back and
Hoogen HM van den. Efficacy of bed rest and orthoses for low back pain: a review of randomised clinical trials. Eur J

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.