Efficacy of percutaneous vertebral augmentation and use of physical therapy intervention following vertebral compression fractures in older adults: a systematic review
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CRD summary
This review evaluated the effectiveness of percutaneous vertebral augmentation and/or physical therapy for the treatment of vertebral compression fractures. The authors reported that percutaneous vertebral augmentation appeared to be an effective treatment for vertebral compression fractures, but the limited evidence means the conclusions should be considered provisional.

Authors' objectives
To evaluate the effectiveness of percutaneous vertebral augmentation and physical therapy following percutaneous vertebral augmentation for the treatment of vertebral compression fractures.

Searching
The Cochrane Library, AHRQ, National Guideline Clearing House, PEDro, Medline and CINAHL were searched from inception through August 2005 for papers in English. Search terms were reported. References of retrieved papers were checked.

Study selection
Eligible studies were pre-specified as quantitative assessments of percutaneous vertebral augmentation following osteoporotic vertebral compression fractures of the lumbar or thoracic spine in older adults. Relevant outcomes included physical therapy, rehabilitation or functional outcomes. The included studies comprised a variety of study designs (non-randomised controlled trials, uncontrolled prospective and retrospective trials). Mean participant age ranged from 66 to 79 years. Outcomes reported included pain levels, medication use, function and quality of life. Included interventions comprised kyphoplasty or vertebroplasty.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Included studies were assessed using a quality scoring system created by the reviewers. One reviewer applied the criteria to all papers.

Data extraction
The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
A narrative synthesis was carried out.

Results of the review
A total of 17 studies were included in this review (n = 1,242) with a total of 2,149 surgically treated fractures. There were two prospective controlled trials (n = 139), 10 prospective uncontrolled studies (n = 590) and five retrospective uncontrolled studies (n = 513). Quality assessment scores were reported for each study and mean percentages grouped by trial design: controlled trials 73 per cent; prospective studies 66 per cent; retrospective studies 63 per cent. Ten studies reported on the outcomes of vertebroplasty and seven reported on kyphoplasty.

All 17 included studies reported beneficial outcomes following percutaneous vertebral augmentation procedures: decreased pain (16 studies); decreased medication use (four studies); increased function (12 studies); improved quality of life (six studies); decreased hospital stay (one study); and fewer physician visits (one study).
Fourteen studies reported on complications following percutaneous vertebral augmentation. Cement leakage was the most commonly reported complication (10 studies) and resulted in no symptoms (six studies), radiculopathy (three studies), lower limb paresis (one study) or need for surgical decompression (one study). Additional fractures were noted in four studies.

None of the included studies reported physical therapy interventions following percutaneous vertebral augmentation.

Authors' conclusions
Percutaneous vertebral augmentation appeared to be an effective treatment for individuals with vertebral compression fractures, but there was no evidence on the use of physical therapy following percutaneous vertebral augmentation.

CRD commentary
This review addressed a clear question with broad inclusion criteria that lead to a heterogeneous group of included studies. Searches may have omitted relevant studies by not including European databases such as EMBASE and by including only English-language papers (language bias). Generally, it was difficult to assess the extent to which this review may have been vulnerable to various biases due to the paucity of details reported about the review processes (study selection, data extraction, validity assessment and so on). The validity assessment included few items relevant to quality of the research. Most items focused on whether or not various outcomes and demographic data had been reported. It was, therefore, unclear to what extent the studies were actually assessed for quality. Further, the results of the assessment process did not seem to have been taken into account during the synthesis, as all studies were reported as though equally reliable and useful. A narrative synthesis was carried out, but it was difficult to determine if this was appropriate as limited details for each study were reported. The results were not clearly grouped by study design or outcome.

The authors reported that percutaneous vertebral augmentation appeared to be an effective treatment for VCF, a conclusion that followed from the limited evidence presented. But, the conclusions should be considered provisional given the limited evidence.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that randomised controlled trials should be carried out to compare conservative treatment and percutaneous vertebral augmentation. Longer term effects were unknown at the time of writing and could be explored. The additional effect of physical therapy with conservative or percutaneous vertebral augmentation treatments should be evaluated.

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Record Status
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.