Efficacy of interspinous device versus surgical decompression in the treatment of lumbar spinal stenosis: a modified network analysis

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CRD summary
The authors concluded that indirect evidence for disability and pain favoured interspinous device placement compared to decompression. There were no significant differences for other outcomes but findings should be considered with caution due to indirect comparisons and short follow-up periods. Given the limitations of the evidence and potential for bias in the review, the authors' cautious conclusions seem appropriate.

Authors' objectives
To compare the effectiveness of interspinous device placement versus surgical decompression for the treatment of lumbar spinal stenosis.

Searching
PubMed, The Cochrane Library and National Guideline Clearinghouse databases were searched between 1970 and March 2010 for publications in English. Search terms were not reported. Reference lists of relevant articles were screened manually.

Study selection
Eligible studies were randomised controlled trials (RCTs) or cohort studies that compared the effectiveness of interspinous device placement or surgical decompression versus each other or versus conservative management in patients aged at least 40 years with lumbar spinal stenosis. Patients with trauma, significant lumbar instability, previous lumbar spine surgery or spondylolisthesis above Grade I were excluded. Outcomes of interest were measures of disability, pain, function and morbidity. Complication rates were reported.

Included studies were in patients who had failed conservative management. Some patients were receiving pain relief. Where reported, the mean age of patients ranged from 62 to 70 years. Conservative management consisted of non-steroidal anti-inflammatory drugs and physical therapy, with or without analgesics and epidural injections. Inclusion criteria for individual trials varied. Methods to measure outcome data varied.

The authors did not state how many reviewers screened studies for inclusion.

Assessment of study quality
Two reviewers independently assessed the strength of evidence using the GRADE criteria. Quality of evidence was downgraded for indirect comparisons and for studies with small sample sizes. Disagreements between reviewers were resolved through consensus.

Data extraction
Changes in outcome data (from baseline to follow-up) were extracted to calculate mean change scores between treatment groups. Complication rates (excluding additional surgery) were extracted. Where possible, data were extracted on an intention-to-treat basis.

The authors did not state how many reviewers extracted these data.

Methods of synthesis
Mean change scores were pooled for each treatment group by outcome measure. A modified network analysis was used to indirectly compare surgical decompression to interspinous-device placement.

The authors stated neither the methods used to perform the analysis nor whether they assessed statistical heterogeneity.

Results of the review
Three RCTs (five publications; 574 patients) were included in the review. Follow-up ranged from six to 48 months. From 64% to 93% of the patients in each study were followed-up at various time points.

Low strength of evidence supported greater treatment effects for interspinous device placement versus decompression at 12 months for the SF-36 physical function score (mean change 18.4 points; two RCTs) and SF-36 pain scores (mean change 16.5 points; two RCTs).

Low strength of evidence showed no statistically significant differences between interspinous device placement and decompression at 12 months for functional outcomes (walking distance) or complication rates.

Authors' conclusions
The indirect treatment effect for disability and pain favours the interspinous device compared to decompression. There were no significant differences for postoperative walking distance or complication rates, but findings should be considered with caution due to indirect comparisons and short follow-up periods.

CRD commentary
The review question and inclusion criteria were clearly stated. The literature search was restricted by language and it was unclear whether unpublished data were sought so potentially relevant data may have been missed. The strength of the evidence was assessed (details not provided) and this indicated that the level of evidence was low. It was unclear whether study selection and data extraction were performed in duplicate so reviewer error and bias could not be ruled out.

Few studies were included in the review and sample sizes were small. The authors did not state which methods they used to combine the evidence and it was unclear whether appropriate methods were used (although the paper referred to online supplemental material which we could not access). The authors acknowledged that the evidence was based on indirect comparisons (which have inherent limitations). They also acknowledged potential for variability between treatment groups, short follow-up duration and patient crossover in treatment groups which can underestimate the true effects of treatment.

Given the limitations of the evidence and potential for bias in the review, the authors' suggestion to interpret the findings with caution seems appropriate.

Implications of the review for practice and research
Practice: The authors stated that the findings should be considered with caution.

Research: The authors stated that further research was very likely to have an important impact on the confidence in the estimate of effect and was likely to change the estimate.

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