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Living FRIendly Summaries of the Body of Evidence using Epistemonikos (FRISBEE)
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Is epidural steroid injection effective for degenerative lumbar spinal stenosis?

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Abstract

There are several nonsurgical alternatives to treat radicular pain in degenerative lumbar spinal stenosis. Epidural steroid injections have been used for several decades, but the different studies have shown variable effects. Searching in Epistemonikos database, which is maintained by screening 30 databases, we identified nine systematic reviews including seven pertinent randomized controlled trials. We concluded epidural steroid injection probably leads to little or no effect on reducing radicular pain of spinal stenosis.

Problem

Degenerative lumbar spinal stenosis is a condition in which the area of the spinal canal decreases because of disc degeneration and facet joint osteoarthritis, predominantly in people over 65 years old. Its main symptom is intermittent neurogenic claudication, which restricts the possibility of walking due to pain in the extremities, causing a significant deterioration in the quality of life.
Among the nonsurgical alternatives epidural steroid injection is often used in order to achieve symptomatic relief, improve functionality and possibly avoid surgery. Among its risks are radicular injury, post puncture headache, metabolic disorders, rash, insomnia, among others [1].

Methods

We used Epistemonikos database, which is maintained by screening more than 30 databases, to identify systematic reviews and their included primary studies. With this information, we generated a structured summary using a pre-established format, which includes key messages, a summary of the body of evidence (presented as an evidence matrix in Epistemonikos), meta-analysis of the total of studies, a summary of findings table following the GRADE approach and a table of other considerations for decision-making.

Key messages
- Epidural steroid injection probably leads to little or no effect on reducing radicular pain of degenerative lumbar spinal stenosis.
- Considering the potential of rare but catastrophic adverse effects of epidural steroid injection, the benefit/risk balance would not be favorable to this intervention.

About the body of evidence for this question

What is the evidence. See evidence matrix in Epistemonikos later	We found nine systematic reviews [2],[3],[4],[5],[6],[7],[8],[9],[10] considering eight primary studies [11],[12],[13],[14],[15],[16],[17],[18], including seven randomized controlled trials [11],[12],[13],[15],[16],[17],[18]. This table and the summary in general are based on the latter. Only one of seven randomized trials presented data that could be included in the summary of findings [13]. The remaining studies were only used for the considerations for decision-making.
What types of patients were included	Five studies included patients with radicular pain caused exclusively by lumbar spinal stenosis [12],[13],[15],[17],[18], while two studies included patients with radicular pain due to spinal stenosis or lumbar herniated nucleus pulposus [11],[16].
What types of interventions were included	The seven studies included in this summary used as intervention interlaminar epidural injection of steroids [11],[12],[13],[15],[16],[17],[18]. Two studies did not mention which corticosteroid was used [12],[17], three studies used methylprednisolone[11],[16],[18], one betamethasone [13] and one triamcinolone [15]. Of the three studies using methylprednisolone one administered 40 mg [18], while the other two used 80 mg [11],[16]. The study using betamethasone administered 6 mg [13], while the study with triamcinolone used 60 mg [15]. Four studies did not mention how many injections they used [12],[13],[15],[16], and the other three used two or more injections [11],[17],[18]. Five studies compared against placebo using a single injection in the same place with local anesthetics [11],[13],[16],[17],[18]. One study compared against a group without intervention [15] and one study did not make clear which intervention was used [12].
What types of outcomes were measured	The outcomes measured were reduction of lower extremity pain in a visual analogue scale (VAS) score, and change in disability with the Roland Morris Disability Questionnaire (RMDQ) and the Oswestry Disability Index (ODI). The time in which the effect was measured varied in different studies, ranging from one week to 4 years after the first intervention. However, meta-analysis considered endpoints at 12-weeks.

Summary of findings

The information on the effects of epidural steroid injections is based on only one study that adequately reported the outcome reduction of pain, which includes 60 patients [20].

- Epidural steroid injection probably leads to little or no effect on reducing radicular pain by spinal stenosis. The certainty of the evidence is moderate.

Epidural steroid injection for spinal stenosis

Patients Radicular pain by degenerative spinal stenosis
Intervention Epidural or interlaminar steroid injection
Comparison Interspinous ligament injection with local anesthetic and saline

Outcomes	Absolute effect*		Relative effect (95% CI)	Certainty of the evidence (GRADE)
	WITHOUT epidural steroid injection	**WITH epidural steroid injection**		
Pain reduction (VAS score 0-10)	Improvement of 4 points	Improvement of 4.4 points	MD 0.4 (-0.25 to 1.05)	⨁⨁⨁◯[1] Moderate
	Difference: 0.4 points more (Margin of error: 0.25 less to 1.05 more)			

MD: Mean difference.
Margin of error = 95% confidence interval (CI).
GRADE: evidence grades of the GRADE Working Group (see later in this article).

* The risk **WITHOUT epidural steroid injection** is based on the risk in the control group of the trials. The risk **WITH epidural steroid injection** (and its margin of error) is calculated from relative effect (and its margin of error).

[1] We downgraded the certainty of the evidence in one level because of imprecision since the confidence interval does not exclude a small effect.

About the certainty of the evidence (GRADE)*

⨁⨁⨁⨁
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⨁⨁⨁◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate

⨁⨁◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⨁◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

*This concept is also called 'quality of the evidence' or 'confidence in effect estimates'.
† Substantially different = a large enough difference that it might affect a decision.

Other considerations for decision-making

To whom this evidence does and does not apply

- The evidence presented applies to patients suffering from lower extremity radicular pain caused exclusively by degenerative lumbar spinal stenosis. Due to the selection of studies that were summarised, this information cannot be applied to lumbar stenosis from other causes.
- This evidence does not apply to patients under 15 years, because they correspond to a group with different characteristics.
- Regarding the intervention, this evidence applies only for interlaminar or epidural injections. Transforaminal injection studies were not considered in this summary.
- This evidence applies to the first 12 weeks after intervention.

About the outcomes included in this summary

- The outcome selected is the overall reduction in pain, including back and lower extremities. This corresponds to the only critical outcome for decision-making in the opinion of the authors of this summary.

Balance between benefits and risks, and certainty of the evidence

- The risks of epidural steroid injection are rare. The certainty of the evidence is moderate, but some clinicians might be inclined to use this intervention despite this limitation, given the security and low cost of this intervention in some centres.

Resource considerations

- The costs of the intervention varies depending of the center where the procedure is conducted. Considering the effectiveness at 3 months is low, the intervention would not be cost/effective in centers where the cost is high. However, it would be in centers with low cost.

Differences between this summary and other sources

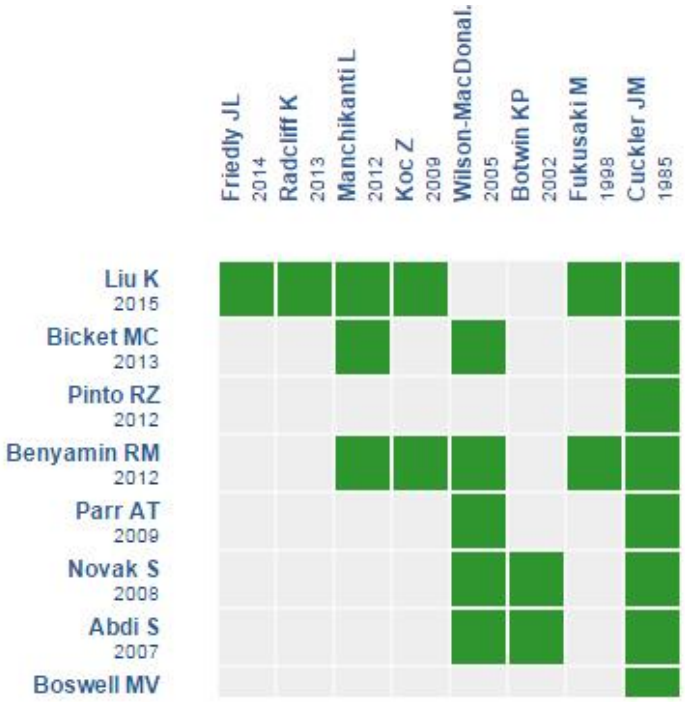
- Considering the conclusion of this summary is mainly based on a single randomized study that reported appropriate data for the proposed analysis, it is consistent with the latest systematic review [5].
- This summary is partially discordant with the main guideline on this topic (North American Spine Society) [19], which recommends epidural steroid injections for spinal stenosis. However, this guideline includes studies until 2011.

Could this evidence change in the future?

- Future evidence might change the conclusions of this summary. Even though the certainty of the evidence is moderate, it comes from a single randomized trial, and there are several ongoing studies addressing the same question.

How we conducted this summary

Using automated and collaborative means, we compiled all the relevant evidence for the question of interest and we present it as a matrix of evidence.



Starting from any systematic review, Epistemonikos builds a matrix based on existing connections in the database.
The author of the matrix can select relevant information for a specific health question (typically in PICO format) in order to display the information set for the question.
The *rows* represent systematic reviews that share at least one primary study, and *columns* display the studies.
The boxes in green correspond to studies included in the respective reviews.

Follow the link to access the **interactive version:** Epidural steroid injection for degenerative lumbar spinal stenosis

Notes

The upper portion of the matrix of evidence will display a warning of "new evidence" if new systematic reviews are published after the publication of this summary. Even though the project considers the periodical update of these summaries, users are invited to comment in *Medwave* or to contact the authors through email if they find new evidence and the summary should be updated earlier. After creating an account in Epistemonikos, users will be able to save the matrixes and to receive automated notifications any time new evidence potentially relevant for the question appears.

The details about the methods used to produce these summaries are described here http://dx.doi.org/10.5867/medwave.2014.06.5997.

Epistemonikos foundation is a non-for-profit organization aiming to bring information closer to health decision-makers with technology. Its main development is Epistemonikos database (www.epistemonikos.org).

These summaries follow a rigorous process of internal peer review.

Conflicts of interest
The authors do not have relevant interests to declare.

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