FPIN's Help Desk Answers

Effectiveness of Epidural Steroid Injections for Low Back Pain

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Clinical Question

Are epidural steroid injections effective for low back pain?

Evidence-Based Answer

Treatment with epidural steroid injections in the lower spine is not effective for reducing pain and disability. The injections may be more effective than placebo at short-term follow-up, but the effects are not clinically meaningful. (Strength of Recommendation [SOR]: A, systematic review of randomized controlled trials [RCTs].) Epidural steroid injection has minimal benefit for patients with chronic (12 months or longer) low back pain. (SOR: A, meta-analysis of RCTs.)

Evidence Summary

A 2020 systematic review of 25 RCTs (N = 2,470) compared the effects of epidural steroid injection (including various dosages of betamethasone, dexamethasone, methylprednisolone, prednisolone, prednisone, triamcinolone) using caudal, interlaminar, or transforaminal approaches with placebo (including normal saline or local anesthetic) in patients with lumbosacral radicular pain.[1] Patients had mean ages ranging from 37 to 53 years. Primary outcomes included leg pain measured by various assessments such as a visual analog scale or numeric rating scale; disability measured by self-reported Oswestry Disability Index or Roland-Morris Disability Questionnaire; and adverse effects. A clinically important difference was stated to be a mean difference (MD) between groups that was greater than 10% of the scale. The outcomes data were also grouped into points of assessment: immediate term (two weeks or less), short term (more than two weeks but less than three months), intermediate term (more than three months but less than 12 months) and long term (12 months or more). Duration of follow-up ranged from 12 hours to one year.

Epidural steroid injections were marginally more effective than placebo in reducing leg pain at short-term follow-up (eight trials; n = 949; MD = −4.93; 95% CI, −8.77 to −1.09) and in reducing overall pain at long-term follow-up (five trials; n = 452; MD = −6.94; 95% CI, −13.69 to −0.19), but no differences in leg pain or overall pain were found at intermediate-term follow-up. Epidural steroid injections were slightly more effective than placebo in reducing disability at short-term follow-up (12 trials; n = 1,367; standardized mean difference [SMD] = −0.27; 95% CI, −0.39 to −0.14) and at intermediate-term follow-up (six trials; n = 866; SMD = −0.20; 95% CI, −0.40 to −0.01). Mostly minor adverse effects (e.g., headache, accidental dural punctures, worsening pain) occurred with treatment and placebo injections with no difference between groups. Limitations mostly involved a lack of appropriate blinding

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and appropriate allocation concealment, resulting in moderate-certainty evidence.

A 2020 meta-analysis[2] (six RCTs; n = 490) included one RCT from the review by Oliveira and colleagues.[1] The meta-analysis compared the clinical effectiveness of epidural steroid injections with conservative treatment (e.g., bed rest, pharmacologic treatments [analgesics, anti-inflammatory drugs, or muscle relaxants], exercise, and physical therapy) for patients with lumbosacral radicular pain. Patients were 18 years and older, had chronic lumbosacral radicular pain for at least one year, and were diagnosed with lumbar disc herniation or spinal stenosis confirmed by magnetic resonance imaging. There were 249 patients treated with epidural steroid injections and 241 patients treated conservatively. Outcomes included pain relief using various visual analog scale scoring systems or a numeric rating scale and were analyzed as short term (up to one month), intermediate term (one to three months), and long term (six months to one year). Functional improvement was measured using the Oswestry Disability Index and grouped as short-term (one to three months) and intermediate-term (three to six months) follow-up. Clinically significant or successful events were defined as "recovery" or "marked improvement" (one trial); a decrease of 2 or more points in average leg pain score with a positive global perceived effect (one trial); complete or partial pain relief with a decrease of more than 20% of visual analog scale score (one trial); patient satisfaction score of 2 (good) or 3 (very good); improvement on the Roland-Morris Disability Questionnaire score of 5 or more and pain reduction of 50% or more at least one year after treatment (one trial); and values above 0 after Z transformation of the raw data of visual analog scale scores, straight leg raise results, and functional status (one trial).

Significant pain reduction was noted in patients who had epidural steroid injections compared with those who received conservative treatment at short-term follow-up (three trials; n = 302; MD = 1.24; 95% CI, 0.58 to 1.91; $P = .0002$; $I^2 = 67\%$) and intermediate-term follow-up (MD = 0.87; 95% CI, 0.48 to 1.26; $P < .0001$; $I^2 = 0\%$). However, the treatment effects were small. There was also a significant difference in pain relief at long-term follow-up (MD = 2.43; 95% CI, 0.47 to 4.38; $P = .02$; $I^2 = 87\%$). No significant differences in functional improvement were observed at short-term follow-up (three trials; n = 298; MD = 3.65; 95% CI, –2.28 to 9.59; $P = .23$; $I^2 = 86\%$) or at intermediate-term follow-up (four trials; n = 398; MD = 5.16; 95% CI, –1.54 to 11.86; $P = .13$; $I^2 = 94\%$). In addition to the small sample size, limitations of this meta-analysis included heterogeneous outcome measures, short follow-up duration, and lack of analysis of specific steroid dosage or type of epidural steroid injections (e.g., transforaminal vs. interlaminar).

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References

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2. Yang S, Kim W, Kong HH, et al. Epidural steroid injection versus conservative treatment for patients with lumbosacral radicular pain: a meta-analysis of randomized controlled trials. *Medicine (Baltimore).* 2020;99(30):e21283. ■