Transforaminal steroid injection for lumbar radicular pain proves superior to placebo

EurekAlert

A recent study from Australian researchers determined that transforaminal injection of steroids was a viable alternative to surgery for lumbar radicular pain due to disc herniation. Full details of the study appear in the August issue of *Pain Medicine*, a journal published by Wiley-Blackwell on behalf of the American Academy of Pain Medicine, the Faculty of Pain Medicine of the Australian and New Zealand College of Anaesthetists, and the International Spine Intervention Society.

Lumbar radicular pain (sciatica) is most commonly caused by lumbar disc herniation and inflammation of the affected nerve roots. Injections of steroids by various routes are used as an alternative to surgery to reduce the inflammation and relieve the pain. Epidural steroid injection, by either the interlaminar or caudal route, is the most widely used steroid treatment for pain relief. However, studies indicate that interlaminar injections are no more effective than normal saline injections into an interspinous ligament, while caudal epidural injections of steroids have failed to prove superior to local anaesthetic alone.

Transforaminal injection?the injection of steroids directly and accurately onto the affected spinal nerve under radiologic guidance?has proved more effective than interlaminar injection of steroids with respect to pain relief and improvement of disability. However, controlled studies of this method of administration produce conflicting results.

The present study examined whether the transforaminal route of injection or the agent injected is the critical element in determining successful pain relief. Study participants were randomized into one of five groups: Transforaminal injection of steroids (TFST) to test its effectiveness; transforaminal injection of normal saline (TFNS) to test for an irrigation effect; transforaminal injection of local anesthetic (TFLA) to test the effect of a local anesthetic; intramuscular injection of steroids (IMST) to test for a systemic effect; or intramuscular injection of normal saline (IMNS) to test for non-specific (placebo) effects.

A total of 150 patients were enrolled in the study. The inclusion criteria were adult patients, capable of providing consent and capable of complying with the outcome instruments used, with pain radiating into the lower limb of a lancinating, burning, stabbing, or electric quality, limitation of straight-leg-raise to less than 30 degrees, and demonstration of a disc herniation by CT or MRI at a segmental level consistent with the clinical features. Pain of the appropriate quality was the primary indication for treatment. Neurological signs of radiculopathy were not required, but served to consolidate the diagnosis when they were present. All patients were classified as eligible for surgery, meaning that surgery would be the next intervention if injections did not relieve the pain.

Exclusion criteria were foraminal stenosis, severe motor deficit, a history of substance abuse, previous surgery at the affected segmental level, or conditions that rendered an injection unsafe, such as pregnancy, recent infection, or spinal deformity. Patients were not excluded on the basis of duration of pain.

After randomization, the five treatment-groups showed no statistically significant differences in demographic features such as age, gender balance, segmental levels treated, or the proportion of acute or chronic cases.

A standard volume and dose were used for each patient for each type of injection. Patients allocated for TFST received 0.75ml of 0.5% bupivacaine followed by 1.75ml of triamcinalone in a concentration of 40mg/ml. The TFLA group received 2 ml of 0.5% bupivacaine. The TFNS group received 2 ml of the saline agent. Patients in the IMST received 1.75 ml of triamcinolone (40mg/ml). Patients allocated for IMNS received a volume of 2 ml.

The primary outcome measure was the proportion of patients who achieved complete relief of pain or at least 50% relief, at one month after treatment. Secondary outcome measures were function, disability, patient-specified functional outcomes, and use of other health care, and duration of relief beyond one month.

A significantly greater proportion of patients treated with transforaminal injection of steroid (54%) achieved relief of pain than did patients treated with transforaminal injection of local anaesthetic (7%) or transforaminal injection of saline (19%), intramuscular steroids (21%) or intramuscular saline (13%). Relief of pain was corroborated by clinically significant improvements in function and disability, and reductions in use of other health care. Outcomes were equivalent for patients with acute or chronic radicular pain. Twenty-five percent maintained relief beyond 12 months.

Study leader Dr. Bogduk concludes, "In essence, transforaminal injection of steroids is a viable alternative to surgery for lumbar radicular pain due to disc herniation. Its immediate yield is modest, but substantial, and is not simply a placebo effect. For long-term efficacy, proof beyond reasonable doubt would require prohibitively large studies."

Editorial author Dr. Ray Baker concurs. "The study results are particularly impressive given the stringent study design." Dr. Baker also praises the team's method of analysis, the number needed to treat (NNT) measure of treatment effect, stating, "From Bogduk's analysis, one can easily grasp that every third patient will be significantly improved beyond what an intramuscular injection of steroid or a transforaminal injection of normal saline can offer. More to the point, one can observe that one in four patients will retain significant benefit with transforaminal injection of steroids at 12 months, while avoiding the cost of surgery. In the end, this landmark study has vindicated transforaminal steroid injection for lumbar radicular pain as superior to placebo. Further studies are now needed."

SOURCE [1]

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