

Original Research Article

CAUDAL EPIDURAL INJECTIONS IN THE MANAGEMENT OF CHRONIC LOW BACK PAIN AND RADICULOPATHY

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ABSTRACT

Background: To assess the efficacy of Caudal Epidural Injections in the Management of Chronic Low Back Pain and Radiculopathy.

Materials & Methods: This was a prospective study where a total of 50 patients within the age range of 20 to 45 years of having chronic low back pain with radiculopathy were enrolled as & when present to Orthopaedic OPD, BK Civil Hospital. All demographic and clinical details of all the patients was obtained. Between April 2023 and August 2023, a group of 50 patients suffering from low back pain with unilateral or bilateral sciatica for at least 3 months and who were not responding to rest and analgesics were offered treatment in the study (inclusion criteria). For the procedure, the patient was placed in a prone/lateral position on the operating table. Suspension containing 15mL saline solution and 1–2mL local anaesthetic and supplemented with 20–40mg triamcinolone was slowly injected. Clinical evaluations were performed immediately after injection and at 3 weeks (visit two), at 3 months (visit three). The VAS, ODI score, and the Straight Leg Raise Test (SLRT) (positive < 60°) were used to differentiate patients whose symptoms improved from those who remained symptomatic.

Results: Pain relief was the primary index for evaluating the outcome of the study. Three weeks was considered short term and 12 weeks as long term for the purpose of our evaluation. We found that the intervention had a large number of patients who reported complete pain relief at the end of the 3-month evaluation period. Oswestry disability index scores were also significantly improved.

Conclusion: Caudal epidural steroid injections seem to be effective when treating patients with low back pain with radiculopathy. It is easy to perform, less technically demanding, and with low complications compared with conservative treatment.

Key words: Caudal Epidural Steroids, Sacral Hiatus, Low Back Pain.

INTRODUCTION

Back pain and related symptoms rank among the second most frequent medical complaints. Disability from low back pain is second only to the common cold as a cause of lost work time and is the most common cause of disability in people under 45 years

of age.^[1] Corticosteroid injections have shown an early and moderate but not sustained improvement compared to placebo in specific outcomes. Corticosteroids have shown good efficacy in reducing pain in a large proportion of patients with lumbar radicular pain.^[2-4] The steroid injection was

first used in 1953, since then it has been increasingly utilized as it was found to have local anti-inflammatory function due to inhibition of secretion of cytokines, thereby reducing pain. Therefore, corticosteroid injections were considered as an efficient and safe choice. Complications from corticosteroid injection are rare. However, Surgery is the main treatment modality for treatment leading to decrease in pain score.^[3-6] Epidural steroid injections (ESIs) are the most commonly performed procedures for the relief of lumbosacral radicular pain.^[7] They may be performed to deliver steroids or local anesthetics to the site of pathology in the epidural space via a transforaminal, interlaminar, or caudal approach.^[7] The underlying mechanism of action of epidurally administered steroid and local anesthetic injections is still not well understood and compounds the problem.^[8] The present study was conducted to assess the efficacy of caudal approach of epidural steroid injection on chronic low back pain with radiculopathy patients.

MATERIAL AND METHODS

The present study was conducted to assess the efficacy of caudal approach of epidural steroid injection on chronic low back pain with radiculopathy patients. A total of 50 patients within the age range of 20 to 45 years of having chronic low back pain with radiculopathy were enrolled as & when presented to Orthopaedic OPD, BK Civil Hospital. All demographic and clinical details of all the patients was obtained. All patients were informed of the procedure and informed consent was taken. Between April 2023 and August 2023, a group of 50 patients suffering from low back pain with unilateral or bilateral sciatica for at least 3 months and who were not responding to rest and analgesics were offered treatment in the study (inclusion criteria). For the procedure, the patient was placed in a prone/lateral position on the operating table. Following skin preparation, the sacral hiatus was identified and both the skin overlying the sacral hiatus and the underlying ligaments were infiltrated with 2–3 mL of 2% preservative-free Xylocaine® without epinephrine. A 22-gauge spinal needle was placed between the sacral cornu at about 45°, with the bevel of the spinal needle facing ventrally until contact with the sacrum was made in the “sacral triangle.” The needle was then redirected more cephalad, horizontal, and parallel to the table, advancing it into the sacral canal through the sacrococcygeal ligament and into the epidural space. This was followed by an aspiration test, then the “hoosh” test. Suspension containing 20 mL of normal saline, 2 mL of 2% preservative-free Xylocaine®, and 2 mL (40 mg/ml) of triamcinolone acetate was then slowly injected.^[9,10] Clinical evaluations were performed immediately after injection, at 3 weeks (visit two) and at 3 months (visit three). The VAS, ODI score,

and the Straight Leg Raise Test (SLRT) (positive < 60°) were used to differentiate patients whose symptoms improved from those who remained symptomatic. Patient monitored for 15 minutes after the procedure and observed for immediate side effects. Pain relief after the epidural steroid injection observed using Visual analogue scale (VAS). At re-evaluation if a patient had complete or no pain, then no further injection therapy was conducted. If a patient had partial-pain relief in 1 week from the time of the injection with a VAS score reduction not more than 20%, a repeated injection was done on an average 2–3 weeks after the first injection.

RESULTS

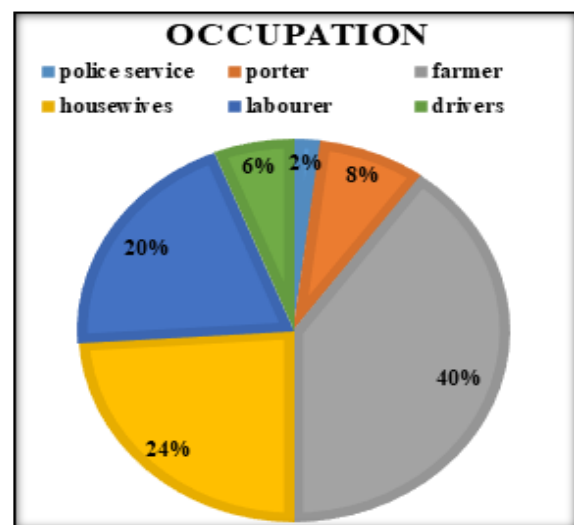


Figure 1: Occupation distribution of patients

In the present study total participants included in the study were 50. Demographic data of these patients is presented in Table 1. Pain relief was the primary index for evaluating the outcome of the study. Three weeks was considered short term and 12 weeks as long term for the purpose of our evaluation. [Table 2] We found that the intervention had a large number of patients who reported complete pain relief even at the end of the 3-month evaluation period. Oswestry disability index scores were significantly improved.

Occupation was a major contributory factor to the chronic low back pain with radiculopathy. Occupations like of farming and heavy weight-lifting by labourers were deemed a major cause for disc prolapse. [Figure 1]

Starting at visit 2 and continuing until visit 3, the SLRT kept improving. This statistically significant improvement was noted in the SLRT.

No patient reported any immediate or late complication(s) following the caudal epidural steroid injection which have been documented in the literature. Ten patients reported experiencing transient bilateral lower extremity numbness immediately after the injection.

The number of patients requiring repeated injections totalled 3, and all of them recovered completely. We found no lower limb dysfunction in terms of loss of sensation and/or reduced motor power, or bladder and bowel dysfunction(s). Follow-up at 6 months after injection identified sustained positive long-term effects of the injection, with 36 patients

(72%) reporting complete pain relief. Occupation has a major role in the incidence of low back pain. There was a statistically significant change in the ODI, as well as VAS between the first and last visits after administration of epidural steroid. The intervention proved to be a much more cost-effective procedure for the patients.

Table 1: Demographic and Clinical data of patients

Age, years	44.64 (12.65)
Gender	
Men	33
Women	17
Duration of symptoms before injection, mo [±]	21.36 (14.22)
Signs and symptoms (visit 1) [±]	
Low back pain (only up to gluteal region)	7 (14%)
Left sciatica	19 (38%)
Right sciatica	10 (20%)
Bilateral	14 (28%)
Stiffness	28 (56%)
Sensory paraesthesia	45 (90%)
Spinal tenderness	40 (80%)
Paraspinal muscle spasm	44 (88%)

Table 2: Pain relief evaluation.*

	Short term (3wks)	Long term (12wks)
Complete relief	46 (92%)	43 (86%)
Partial relief	3 (6%)	6 (12%)
No relief	1 (2%)	1 (2%)

Table 3: Visual analogue score (VAS), Oswestry disability index (ODI) scores

	Mean score	Standard deviation	Significance within group 95% confidence interval P value
VAS before injection	8.06	±1	
VAS after intervention	2.02	±1.6	<.01
VAS follow up	2.69	± 0.8	<.01
ODI before intervention	36.04	±2	
ODI after intervention	11.94	±5.6	<.01
ODI follow up	12.28	± 2.6	<.01

Table 4: Complications in patients during the procedure.*

Complication	No. (%) of patients
Attempts required for steroid placement	
One	35 (70)
Two	11 (22)
Three	4 (8)
Difficulty in approach	11 (22)
Dural puncture (cerebrospinal fluid tap)	(none)
Headache	9 (18)
Hypotension (recorded during procedure)	None
Bleeding (at the time of injection)	1(2)
Repeat injections	3(6)
No. required (mean)	

DISCUSSION

The indication and efficacy of ESI still remains controversial. This technique is currently used as an intermediate treatment for back pain of various causes and duration. It is not considered curative, but a number of patients have reported long and short-term pain relief.^[11-13]

Manchikanti L et al in 2012 showed that there was no significant difference between two groups one which received epidural local anaesthetics and other who received local anaesthetics with steroid.^[14]

Lee et al. reported that approximately 85% of patients showed improvements after an initial caudal ESI and some 55% displayed excellent amelioration after a series of caudal ESI.^[15]

Manchikanti et al. stated that significant pain relief (≥ 50%) was demonstrated in 55–65% of the patients with spinal stenosis after the use of caudal injection.^[16]

There is a high morbidity associated with chronic low back pain and its associated management.^[17] The etiology of chronic low back pain remains unclear.^[18,19] Disc degeneration, herniation, or by an inflammatory reaction could be responsible for

lower backache.^[20] In 1901, Sicard introduced the injection of cocaine through the caudal route into the epidural space and ever since caudal epidural steroid injections are commonly used when dealing with chronic low back and/or radicular pain.¹⁸ This approach to the epidural space is the earliest known technique for epidural steroid injection or blocks.^[21] Dansfield et al,^[19] evaluated caudal epidural injection and root blocks, but concluded that both treatments were effective and had no significant differences. Singh and Manchikanti,^[18] evaluated caudal epidural injections with limited success. Bush and Hillier,^[22] evaluated the injections containing steroid and saline and concluded that in the short term they were effective but the long-term potency was variable. Cuckler et al,^[17] did a similar study with variable results but favoured steroid placement.

We assessed the efficacy of caudal epidural steroid injections containing a preparation of local anaesthetic and steroid in a group of patients with chronic low back pain and sciatica.

Our results showed that 50 patients from the group responded well to the first injection itself. Recovery from symptoms was evaluated by ODI score primarily and was steadily observed from the first week following the injection. The main therapeutic result of the injection appeared during the first week itself, when an immediate decrease in the mean ODI score of the patients was noticed. [Table 3]

All our patients had MRI confirmation for the pathology.^[20] Although the efficacy of caudal epidural steroid injections in the treatment of low back pain and sciatica has been demonstrated, the purported mechanisms of such benefits continue to lack scientific validation.^[23] It is hypothesized that corticosteroids exert their anti-inflammatory actions either by inhibiting the synthesis or release of inflammatory substances.^[23] Membrane stabilization, inhibition of neural peptide synthesis or action of phospholipase A2 activity, and prolonged suppression of ongoing neuronal discharge are also possible effects of corticosteroids.^[18] The administration of any saline solutions may dilute locally accumulated chemical irritants.^[20]

The chance of puncturing the dura appears low using the caudal method. The lumbar method carries a risk of trauma to the nerve root during needle placement and also includes the risk of paraplegia if steroid is injected into a radicular artery that supplies the anterior spinal artery.^[24] Furthermore, disc infiltration can be a complication of the lumbar access route as well.

CONCLUSION

Caudal epidural steroid injections seem to be effective when treating patients with low back pain and sciatica. They are easy to perform, less technically demanding, and with low complications

compared with conservative treatment. Caudal epidural injections may offer an interesting alternative approach to managing low back pain and sciatica.

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