

## A Longitudinal Retrospective Research Looked at the Effectiveness of Caudal Epidural Steroid Treatments in the Management of Severe Lower Backache

Abhas Kumar<sup>1</sup>, Kumar Gaurav<sup>2</sup>, Manish Kumar<sup>3</sup>, N.P. Sinha<sup>4</sup>

<sup>1</sup>Senior Resident, Department of Orthopaedics, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

<sup>2</sup>Senior Resident, Department of Orthopaedics, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

<sup>3</sup>Senior Resident, Department of Orthopaedics, Nalanda Medical College and Hospital, Patna, Bihar, India

<sup>4</sup>Assistant Professor and HOD, Department of Orthopaedics, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

---

Received: 03-07-2021 / Revised: 20-08-2021 / Accepted: 10-09-2021

Corresponding author: Dr. Abhas Kumar

Conflict of interest: Nil

---

### Abstract

**Aim:** To find Role of caudal epidural steroid injections in the management of chronic low backache. **Materials and Methods:** A prospective study was conducted in the Department of Orthopaedics, Department of Orthopedics Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India. for 12 months. Total 80 Patients with chronic low back pain and sensory symptoms not responding to conservative management were include in this study. They were evaluated clinically before and after epidural steroid on the basis of pain, unrestricted activities of day-to-day life and work performance on the basis of visual analogue scale and Oswestry disability index. **Results:** Total 165 ESI were given to 120 patients. 85 patients were given single injection, while 25 had two and 10 received three ESI doses. Out of 120, 50 were males and 70 females with chronic LBP. Out of 120 cases of LBP, Lumbar disc herniation was seen in 37, lumbar canal stenosis in 11 and degenerative disc disease in 22 cases while 50 cases had non-specific LBP. Follow up was done at one week, one month and then every three months up to twelve months of treatment (post third ESI 9 months). Mean pre ESI, VAS was 7.11 while it was 4.82 at one year of treatment. Mean pre ESI, ODI score was 59.12 while after twelve months of treatment with ESI it was 44.64 at one year. We obtained excellent results in 27.5 percent, good in 38.33 percent, fair in 21.67 percent while poor in 12.5 percent patients. **Conclusion** ESIs are very effective and significantly reduce pain in patients with chronic function-limiting LBP.

**Keywords:** Low Back Pain, Epidural Steroid Injections.

---

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

---

### Introduction

Chronic low back pain, which has detrimental consequences in one's life and

leads to work force decline, is a significant public health problem. According to the data, 10% of all low back pains last for 4 to

6 weeks, at which point they are classified as permanent low back pain. The most common symptom in general neurosurgery practise is chronic axial and/or radicular low back pain, which can be treated with a variety of techniques. When conservative procedures fail, Lumbar epidural steroid applications and surgical methods should be used[1]. Today, it is stated that inflammatory process in addition to mechanical compression plays an important role in the formation of pain especially related to discopathy[2,3]. Nowadays, by the development of imaging quality of radiologic survey and these methods being attainable, lumbar degenerative diseases are diagnosed before the formation of a serious neural compression. For these patients, lumbar steroid applications can be used to suppress inflammation, and this allows the patient to continue the former daily activities in the early period[4,5].

In patients with chronic LBP, epidural injections with or without steroids have shown to be effective in many trials. Lumbar epidural implants have been widely used to relieve lumbar radicular pain in the many interventions used to manage severe spinal pain. For certain types of LBP and leg pain, epidural steroid injections (ESIs) are a popular treatment choice. Since 1952, they've been used to treat low back pain, and they're also an important part of the non-surgical treatment of sciatica and LBP. The goal of the injection is pain relief; at times the injection alone is sufficient to provide relief, but commonly ESIs is used in combination with a comprehensive rehabilitation program to provide additional benefit[6,7]. The first documented epidural injection in the history of mankind was done in 1901 using caudal approach, where cocaine was used to treat such patients of low back ache with radiculopathy[8]. Use of epidural steroid injection for the treatment was first reported in 1953[9]. Steroids reduce inflammation[10,11] by inhibiting proinflammatory mediators like phospholipase A2, histamine etc and by the action of stabilizing hyper-excitable nerve

membranes. In addition to being a less invasive procedure, epidural steroid injections have less morbidity and mortality compared to the surgical procedures[12]. However, there are reports of serious complications such as arachnoiditis and meningitis[13]. The aim of this study was to evaluate the functional outcomes in cases of chronic low back ache of more than three months managed by caudal epidural steroid injections.

### Materials and methods

A prospective study was conducted in the Department of Orthopedics, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India for 12 months after taking the approval of the protocol review committee and institutional ethics committee.

### Methodology

There were 120 patients with LBP who were treated with caudal epidural steroids in sterile environments in an operating room under fluoroscopic supervision and who did not respond to other nonsurgical and non-invasive approaches. This research included patients with severe low back pain and sensory symptoms who had not responded to conservative treatment. Patients who had lumbar disc surgery or had some form of motor deficit were excluded from the study. Methylprednisolone 80 mg, bupivacane 0.5% (6ml), normal saline 32 ml Patient was put in prone position with a pillow under pubic symphysis. Area of skin over sacral hiatus was infiltrated with 1% lignocaine. After piercing sacrococcygeal ligament, an 18-gauge Tuohy needle was introduced into sacral canal through sacral hiatus route. Accurate placement of epidural injection needle was confirmed by lateral view of c arm image intensifier and ESI dose was given. We noted the pain scores on visual analogue scale (VAS) and Oswestry disability index (ODI) to evaluate the results after caudal ESI. Cases were evaluated as per their ability to perform

activities and their ability to return to work before and after the administration of ESI. A total of three epidural doses were given. Second dose was given after a gap of one month to patients with insignificant / no pain relief. Third dose was given only in patients not achieving any pain relief after three months. Further follow up included evaluation of VAS and ODI after a periodical gap of three months regularly up to one year. Cases were categorized as per excellent, good, fair and poor depending upon pre decided criteria of pain relief and activity levels as per VAS and ODI scores.

### Results

120 patients received a total of 165 ESI. 85 patients received a single ESI injection, 25 received two, and 10 received three. This

research contained a total of 120 cases, 50 of which were males and 70 of which were females with chronic LBP. Lumbar disc herniation was seen in 37 of the 120 cases of LBP, lumbar canal stenosis in 11 cases, and degenerative disc disease in 22 cases, while 50 cases had non-specific LBP. (Table.3) Up to twelve months after treatment, follow-up was performed one week, one month, and then every three months (post third ESI 9 months). VAS was 7.11 on average before ESI and 4.82 after one year of therapy. (Table 4) Mean pre ESI, ODI score was 59.12 while after twelve months of treatment with ESI it was 44.64 at one year. (Table 5) We obtained excellent results in 27.5 percent, good in 38.33 percent, fair in 21.67 percent while poor in 12.5 percent patients. (Table 6)

**Table 1: Showing number of epidural doses given**

Number of patients=120	Number of ESI doses	Total doses=165
85	01	85
25	02	50
10	03	30

**Table 2: Showing sex distribution of cases of ESI**

Gender	Number of cases=120	Percentage
Males	50	41.67
Females	70	58.33

**Table 3: Showing causes of LBP**

Cause	Number of cases	percentage
Nonspecific	50	41.67
Lumbar disc herniation	37	30.83
Lumbar canal stenosis	11	9.17
Degenerative disc disease	22	18.33
Total	120	100

**Table 4: Showing mean VAS score**

Time interval	Mean	SD (standard deviation)
Pre injection	7.11	1.19
At one week	3.81	0.81
At one month	3.62	0.78
At 3 months	4.08	0.74
At 6 months	4.26	0.78
At 9 months	4.51	0.87
One years	4.82	0.78

**Table 5: Showing ODI score (percentage)**

Time interval	Mean	SD
Pre injection	59.12	7.77
At one week	26.21	4.62
At one month	25.55	3.84
At 3 months	24.77	2.88
At 6 months	23.03	4.39
At 9 months	41.11	7.62
One years	44.64	7.58

**Table 6: Showing results after intervention by ESI**

Result	Number of patients=120	percentage
Excellent	33	27.5
Good	46	38.33
Fair	26	21.67
Poor	15	12.5

## Discussion

Epidural steroid injection is a less invasive and safe treatment for people with low back pain and radiculopathy. While the treatment carries a number of complications, such as pneumonia, epidural hematoma, dura-cutaneous fistula, and post-dural puncture headache, the risk is relatively low. Nausea, fatigue, dizziness, and vasovagal shock are also possible side effects, and patients should be informed about them before the operation. None of these issues were discovered in our research.

Back pain, particularly in the lumbar area, has become a common occurrence as a result of poor postures, a lack of workouts, and an undue load on the spine, whether or not there is a history of mild to severe trauma. Analgesic usage for an extended period of time is neither advisable nor useful. Lumbar tractions, multiple physiotherapy methods, and manipulations have all been used to treat LBP, but the findings have been mixed. Surgical surgery is only indicated in persistent situations or where the patient's neurological condition is worsening. With such a small toolkit, a large percentage of LBP patients who attend different orthopaedic departments are dissatisfied or unrelieved. Caudal,

interlaminar, and epidural steroid injections are also options.

Robechhi and Capra[14] and Lievre[15] described use of ESI by transforaminal route while use of corticosteroids by caudal epidural space was reported by Cappio[16]. We used caudal epidural technique and found satisfying results. Corticosteroids exert both anti inflammatory and immunosuppressive effects. These have various modes of action like membrane stabilization and inhibition of neural peptide synthesis. Panayiotis JP et al[17] conducted a study on treatment of lumbosacral radicular pain with epidural steroid injections. They concluded that 68% of patients were asymptomatic, 20% had no change in pre injection radicular symptoms, and 12% had various degrees of pain relief. Peng et al[18] observed in a study over 42 patients that leakage of chemical mediators or inflammatory cytokines produced in a painful disc into epidural space through annular tear could lead to injury to adjacent nerve roots and might constitute the primary pathophysiological mechanism of radiating leg pain in patients with discogenic low back pain but with no disc herniation. Ackerman et al[19] documented change of pain score and functional score only after 2 weeks of treatment with ESI and followed cases up to 24 weeks. We could obtain

comparable results after second ESI at One month. In a meta-analysis study, Choi H J et al[20] studied long term benefits of epidural steroids in LBP in terms of pain, disability and subsequent surgery. There study suggested benefits for less than six months only. We achieved short term benefits of pain relief for 9 to 12 months after caudal ESI. In a systemic review by Jun L et al<sup>21</sup> for comparing effectiveness of transforaminal versus caudal ESI for managing lumbosacral radicular pain, the outcomes and clinical significance of 6 prospective studies were summarized. They found both transforaminal and caudal ESI to be similarly effective. Transforaminal ESI was more effective for pain over duration of less than six months and caudal ESI exhibited better impact on both pain and functionality over a longer period (one year). The current study obtained significant pain relief by caudal route in 85 percent cases over a period of three months and moderate relief in 62 percent cases over one year. Only 8 patients required further surgery as they were not relieved of pain and radicular symptoms even after two ESI. Singh H et al[22] concluded that better results can be obtained with caudal ESI in patients presenting earlier. ESI should not be given to antenatal patients (due to fluoroscopy exposure), cases with any bleeding disorder, any local or systemic infections. These should be avoided in patients with allergy to local anaesthetic agents and patients with congestive cardiac failure and diabetes mellitus. Corticosteroids may cause adrenal dysfunction and suppression of hypothalamic pituitary axis suppression in larger doses. Though dural puncture (0.5 to 5%), 4 bacterial meningitis, aseptic meningitis and epidural abscess[23,24] have been reported with use of ESI, we reported complication of pain at the ESI site only in 9 patients. This was managed with conservative means.

### Conclusion

ESIs are very successful and greatly mitigate discomfort in patients with chronic function-limiting LBP, according to the findings of this report. This report has opened up new avenues for potential investigation.

### Reference

1. Benyamin RM, Manchikanti L, Parr AT, Diwan S, Singh V, Falco FJ, Datta S, et al. The effectiveness of lumbar interlaminar epidural injections in managing chronic low back and lower extremity pain. *Pain Physician* 2012;15(4):E363-404.
2. Goupille P, Jayson MI, Valat JP, Freemont AJ. The role of inflammation in disk herniation-associated radiculopathy. *Semin Arthritis Rheum.* 1998;28(1):60-71.
3. Hamamoto H, Miyamoto H, Doita M, Takada T, Nishida K, Kurosaka M. Capability of nondegenerated and degenerated discs in producing inflammatory agents with or without macrophage interaction. *Spine (Phila Pa 1976).* 2012;37(3):161-167.
4. Parr AT, Manchikanti L, Hameed H, Conn A, Manchikanti KN, Benyamin RM, Diwan S, et al. Caudal epidural injections in the management of chronic low back pain: a systematic appraisal of the literature. *Pain Physician.* 2012;15(3):E159-198.
5. Stout A. Epidural steroid injections for low back pain. *Phys Med Rehabil Clin N Am.* 2010;21(4):825-834.
6. Kuslich SD, Ulstrom CL, Michael CJ. The tissue origin of low back pain and sciatica: a report of pain response to tissue stimulation during operations on the lumbar spine using local anesthesia. *Orthop Clin North Am.* 1991; 22:181-7.
7. Manchikanti L, Boswell MV, Singh V, Benyamin RM, Fellows B, Abdi S, et al. Comprehensive evidence-based guidelines for interventional techniques in the management of chronic spinal pain. *Pain Physician.* 2009; 12:699-80

8. Sicard A. Les Injections medicamenteuses extra dures par voie sacro-coccygienne. CR Soc Biol Paris. 1901.53:369.
9. Sitzman BT. Epidural injection. In: Fenton DS, c Zervionke LF, editors. Image-guided Spine intervention. Philadelphia: saunders; 2003. PP.99-126.
10. Manchikanti L, Transforaminal lumbar epidural steroid injections- pain physician 2000;3:374.
11. Curlee PM. Other disorders of the spine. In:Canale ST, Beatty JH(eds.) campbell's operative orthopedics,11th ed.philadelphia, Pa:Mosby Elsevier; 2007.
12. Manson NA, McKeon MD, Abraham EP. Transforaminal epidural steroid injections prevent the need for surgery in patients with sciatica secondary to lumbar disc herniation: A retrospective case series. Can J Surg 2013; 56: 89-96.
13. Collighan N, Gupta S. Epidural steroids. Cont in Educ Anaesthe Crit Care Pa in 2010; 10: 1-5.
14. Robecchi A, Capra R. Hydrocortisone (compound F); first clinical experiments in the field of rheumatology. Minerva Med. 1952;43(98):1259-1263.
15. Lievre JA, Bloch-Mechel H, Pean G. L hydrocortisone an injection locale. Rev Rhum. 1953; 20:310-311.
16. Iltrattamen to idrocortisonico per via epidurale sacrale delle lombosciatalgie. Reumatismo. 1957; 9:60-70.
17. Panayiotis J. Treatment of Lumbosacral Radicular Pain with Epidural Steroid Injections. Orthopaedics. 2001;24(2):145-149.
18. Peng B, Wu W, Li Z, Guo J, Wang X. Chemical radiculitis. Pain. 2007; 127:11-16.
19. Ackerman WE, Ahmed M. The efficacy of lumbar epidural steroid injections in patients with lumbar disc herniations. Anesth Analg. 2007; 104:1217-1222.
20. Choi HJ, Hahn S, Kim CH, Jang BH, Park S. Epidural steroid injection therapy for low back pain: a meta-analysis. IJTA Health Care. 2013;29(3):244-253.
21. Jun L, Hengxing Z, Lu L, Xueying L, Jun J. The effectiveness of transforaminal versus caudal routes for epidural steroid injections in managing lumbosacral radicular pain. Med. 201695;1-11.
22. Singh H. Correlation of functional results of caudal epidural steroid injections with duration of symptoms in PIVD. Int J Re Orthop. 2018;4(3):458-462.
23. Manchikanti L, Staats PS. Evidence based practice guidelines for interventional techniques in the management of chronic spinal pain. Pain Physician. 2003; 6:3-80.
24. Boswell MV, Trescot AM. Interventional techniques: Evidence based practice guidelines in the management of chronic spinal pain. Pain Physician. 2007; 10:7-111.