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**Original research article**

# A hospital-based assessment of efficacy of caudal epidural steroid injections in the management of chronic lower back pain: an observational study

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**Abstract**

**Aim:** The aim of this study was 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, Mamata Academy of Medical Sciences, Bachupally, Hyderabad, India for the period of 1 year. 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 9months). Mean pre ESI, VAS was 7.11while 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.

## Introduction

An major issue in community health is chronic low back pain, which has detrimental consequences on daily living and reduces labor force participation. The statistics show that 10% of all low back problems become chronic when they last for 4 to 6 weeks. The most common complaint in general neurosurgical practice, persistent axial and/or radicular low back pain, can be treated using a variety of techniques. When conservative approaches fail, surgical procedures and lumbar epidural steroid injections may be performed [1]. Inflammatory process, in addition to mechanical compression, is now thought to have a significant role in the development of pain particularly that connected to discopathy [2, 3]. Nowadays, lomber degenerative disorders are identified before a major brain compression form because to improvements in imaging quality and the accessibility of these procedures. In order to reduce inflammation in these individuals, lomber steroid treatments may be performed, which enables the patient to first resume their previous daily routines [4, 5].

Numerous studies have demonstrated that individuals with chronic LBP who get epidural injections, whether they include steroids or not, significantly improve. Lumbar epidural injections have been widely utilized to treat lumbar radicular pain among the several therapies used to manage persistent spinal pain. For many types of LBP and leg pain, epidural steroid injections (ESIs) are a typical therapy choice. Since 1952, they have been used to treat low back pain, and they continue to be a crucial component of non-surgical care for sciatica and LBP. The purpose of the injection is to relieve pain; occasionally, the injection alone is sufficient to do so, but often, ESIs are used in conjunction with a thorough rehabilitation program to gain extra advantages [6, 7]. Cocaine was utilized to treat patients with low back pain and radiculopathy in the caudal approach, which resulted in the first documented epidural injection

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in human history [8]. The first instance of the use of epidural steroid injection for the therapy dates back to 1953 [9]. By blocking proinflammatory mediators such as phospholipase A2, histamine and others, as well as by stabilizing hyper excitable neuronal membranes, steroids suppress inflammation [10, 11]. In addition to being less intrusive than surgery, epidural steroid injections have lower rates of morbidity and death. However, there have been instances of severe side effects such meningitis and arachnoiditis [13]. The purpose of this study was to assess the functional results in patients treated with caudal epidural steroid injections for chronic low back pain lasting longer than three months.

**Materials and Methods**

A prospective study was conducted in the Department of Orthopedics, Mamata Academy of Medical Sciences, Bachupally, Hyderabad for the period of 1 year, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient.

**Methodology**

Total 120 patients of LBP with caudal epidural steroids under sterile conditions in operating room under guidance of fluoroscopic control that fulfilled the required inclusion criteria and was not responding to other non-surgical and non-invasive methods. Patients with chronic low back pain and sensory symptoms not responding to conservative management were include in this study. Patients prior lumbar disc surgery and any motor deficit were excluded from 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**

Total 165 ESI were given to 120 patients. 85 patients were given single injection, while 25 hadtwoand10received three ESI doses. We included total 120 cases in this study, 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. (Table. 3) Follow up was done at one week, one month and the never 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. (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 |

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**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**

An efficient and less invasive approach of treating patients with low back pain and radiculopathy is epidural steroid injection. Although there are several hazards connected with the surgery, such as infection, epidural hematoma, dura-cutaneous fistula, post-dural puncture headache, etc., the risk is rather low. Before the operation, the patients should be informed about any potential risks, such as nausea, vomiting, dizziness, and vasovagal shock. In our investigation, none of these problems were present.

Due to poor posture, a lack of exercise, and an increased load on the spine, especially in the lumbar area, back pain has become a common issue, whether or not there has been a history of minor to severe injuries. Analgesic usage over an extended period of time is neither wise nor advantageous. Lumbar tractions, different physiotherapy methods, and manipulations have all been tried to treat LBP, although with varying degrees of success. Only persistent instances or those with a neurological condition that is worsening should consider surgery. Many LBP sufferers attend various orthopaedic departments feeling unhappy or unrelieved due to this restricted toolkit.

Caudal, interlaminar or transforaminal routes can be utilized to provide epidural steroid injections. Transforaminal ESI administration was documented by Robechhi, Capra, and Lievre [14, 15], while Cappio reported using corticosteroids in the caudal epidural region [16]. We had good success with the caudal epidural method. Both anti-inflammatory and immunosuppressive effects are produced by corticosteroids. These work in a variety of ways, including by stabilizing membranes and preventing the creation of neural peptides. Research on the use of epidural steroid injections to alleviate lumbosacral radicular pain was carried out by Panayiotis JP *et al.* [17]. They came to the conclusion that 68% of patients had no symptoms, 20% had pre-injection radicular symptoms that were same and 12% experienced varying degrees of pain alleviation. In a study involving 42 patients, Peng *et al.* [18] found that the primary pathophysiological mechanism of radiating leg pain in patients with discogenic low back pain but no disc herniation may involve the leakage of chemical mediators or inflammatory cytokines produced in a painful disc into epidural space through an annular tear. This could cause injury to nearby nerve roots. Only after 2 weeks of ESI therapy and after patients had been monitored for up to 24 weeks could Ackerman *et al.* [19] show a change in the pain score and functional score. After the second ESI after one month, we could get outcomes that were comparable. Choi H.J. *et al.* [20] examined the long-term advantages of epidural steroids in LBP in terms of pain, disability, and subsequent surgery in a meta-analysis research. Only advantages lasting less than six months were suggested by the study. After caudal ESI, we had immediate advantages of pain alleviation for 9 to 12 months. The results and clinical importance of 6 prospective trials were reported in a comprehensive review by Jun L *et al.* [21] comparing the efficacy of transforaminal vs. caudal ESI for treating lumbosacral radicular pain. They discovered

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that the efficacy of caudal and transforaminal ESI was comparable. Caudal ESI had a greater effect on both pain and functioning over a longer length of time (one year), whereas transforaminal ESI was more helpful for pain during periods of less than six months. In the current study, caudal pain alleviation was considerable in 85% of instances over a three-month period and moderate in 62% of cases over a one-year timeframe. Only 8 individuals needed further surgery because, despite receiving two ESI, their radicular symptoms and discomfort remained unrelieved. According to Singh H. *et al*. [22], caudal ESI can produce superior outcomes in individuals who present sooner. Due to fluoroscopy exposure, ESI should not be administered to pregnant patients, those who have bleeding disorders, or people who have any local or systemic illnesses. Patients with congestive heart failure, diabetes mellitus, and local anesthetic drug allergies should not use them. In higher dosages, corticosteroids may result in adrenal dysfunction and suppression of the hypothalamic-pituitary axis.

**Conclusion**

The present study concluded that ESIs are very effective and significantly reduce pain in patients with chronic function-limiting LBP. This study has opened new vistas for future research.

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