

## Original Research

### To investigate the role of caudal epidural steroid injections in the therapy of chronic low backache

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#### ABSTRACT:

**Aim:** The aim of this study was To investigate the role of caudal epidural steroid injections in the therapy of chronic low backache. **Materials and Methods:** A prospective study was conducted in the Department of orthopaedics. Total 120 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. **Conclusions:** ESIs are very effective and significantly reduce pain in patients with chronic function-limiting LBP. **Keywords:** Low back pain, Epidural steroid injections.

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#### INTRODUCTION

Chronic low back pain, which has negative effects on life and which causes labor force loss, is an important community health problem. According to the data, 10% of all low back pains continue for 4 - 6 weeks, and are then called chronic low back pain. The treatment of chronic axial and/or radicular low back pain, which is the most frequently encountered complaint in general neurosurgery practice, includes a wide range of options. Lumbar epidural steroid applications and surgical methods can be used when the conservative methods are inadequate.<sup>1</sup> 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.<sup>2,3</sup> 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.<sup>4,5</sup>

Many studies have shown significant improvement with epidural injections with or without steroids in patients with chronic LBP. Among the multiple interventions used in managing chronic spinal pain; lumbar epidural injections have been used extensively to treat lumbar radicular pain. Epidural steroid injections (ESIs) are a common treatment option for many forms of LBP and leg pain. They have been used for low back problems since 1952 and are still an integral part of the non-surgical management 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.<sup>6,7</sup> 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.<sup>8</sup> Use of epidural steroid injection for the treatment was first reported in 1953.<sup>9</sup> Steroids reduce inflammation<sup>10,11</sup> 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.<sup>12</sup> However, there are reports of serious complications such as arachnoiditis and meningitis.<sup>13</sup>

## MATERIALS AND METHODS

A prospective study was conducted in the Department of Orthopaedics, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient. 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 exclude 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 had two and 10 received 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 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. (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 |
|---------------------------|-----------------|------------|
| Non specific              | 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 an effective and less invasive method of treating patients of low backache with radiculopathy. Although there are many risks like infection, epidural hematoma, dura-cutaneous fistula, post dural puncture headache etc associated with the procedure, the risk is quite low. Nausea, vomiting, dizziness and vasovagal shock can also occur and the patients should be warned regarding all these complications before the procedure. None of these complications were seen in our study. Back pain especially in lumbar region has become a routine problem due to faulty postures, lack of exercises, and excessive burden on spine with or without history of minor to moderate trauma. Prolonged use of analgesics is neither advisable nor beneficial. Lumbar tractions, various physiotherapy techniques, manipulations, all have been used for LBP but with inconsistent results. Surgical interventions are recommended for incessant cases or with a deteriorating neurological status only. With such a limited armamentarium, there are a big number of unsatisfied / unrelieved patients of LBP visiting various orthopaedic departments. Epidural steroid injections can be used by caudal, interlaminar or transforaminal approaches. Robechhi and Capra<sup>14</sup> and Lievre<sup>15</sup> described use of ESI by transforaminal route while use of corticosteroids by caudal epidural space was reported by Cappio.<sup>16</sup> 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<sup>17</sup> 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<sup>18</sup> 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<sup>19</sup> 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, McClain RF et al<sup>20</sup> studied long term benefits of epidural steroids in LBP in terms of pain, disability and subsequent surgery. Their 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 Lawrence RC 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. Bogus N et al<sup>22</sup> 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<sup>23</sup>.<sup>24</sup> 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 effective and significantly reduce pain in patients with chronic function-limiting LBP.

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