Role of Caudal Epidural Steroid in the Management of Low Back Pain in Telangana Population, India

Srinivasa Mahendra Muniswamy Parasuraman¹, Madhusudhan Kumar Ummadisetty²

¹Associate Professor, Department of Orthopaedics, Surabhi Institute of Medical Sciences, Siddipet, Telangana State, India, ²Associate Professor, Department of Orthopaedics, Mallareddy Institute of Medical Sciences, Suraram, Hyderabad, Telangana, India.

How to cite this article: Srinivasa Mahendra Muniswamy Parasuraman, Madhusudhan Kumar Ummadisetty. Role of Caudal Epidural Steroid in the Management of Low Back Pain in Telangana Population, India. Indian Journal of Public Health Research and Development 2023;14(3).

Abstract

Background: Low back pain (LBP) is a common condition seen in adult patients causing significant functional and psychological disability in addition to the variable amount of pain.

Method: Every patient was studied with x-rays, MRI of lumbosacral region and degree of pain was assessed by VAS scale. Routine blood investigations were done in every patient to rule out any other possible causes for this condition.

Results: 95 patients with LBP were included in this study. Among these 16 (16.8%) either had annular tears or no abnormality in MRI leading to acute back pain, 14 (14.7%) had spondylolisthesis, 25 (26.5%) had lumbar canal stenosis, 40 (42.1%) had degeneration of disc. As per VAS (Visual Analogue Score) at 3rd month -14 patients of Acute LBP, 12 patients with spondylolisthesis, 13 patients with lumbar canal stenosis, 26 patients with degenerative disc disease had significant improvement.

Conclusion: Present study used X-rays, MRI and VAS analogue Score in addition to systematic clinical examination for evaluation of the low back pain patients. Patients who were resistant to conservative measures were treated with epidural steroid injection before subjecting them to any surgical intervention. This is important for the Orthopedicians to treat such patients efficiently with minimal invasion without subjecting them to more invasive measures like open surgical procedures.

Keywords: MRI, VAS, LCS, LBP, Caudal epidural steroid injection

Introduction

Low back pain is the most frequent and persistent cause of disability that occurs in 15-80% of the patients globally including, India¹. It also has been reported that 13% of the population suffers with persistent low back pain of high intensity leading to moderate to severe disability². Back pain is also prevalent in 12 % of children and adolescents, 15% of adults, 27% of elderly population. Introduction of caudal epidural steroid injection started around 1900³. Tissues of the low back are capable of transmitting pain which
include muscles, ligaments, fascia, discs, nerve roots, dura and facets joints. It is difficult to identify the causative factors for low back pain (LBP) which may be either a facet joint or disc or another structure which is generally differentiated based on clinical features of somatic/ referred or radicular pain but persistent LBP is a diagnostic dilemma in majority of the patients even in experienced hands even with availability of all advanced technologies. It is believed that, the benefits of caudal epidural steroid injection may be multifold including clearing the adhesions or inflammation from the vicinity of nerve root sleeve and neurolytic or other unknown beneficialeffects(4 5). Hence this study was under taken to evaluate the role of caudal epidural steroid injections in the patients with different clinical manifestations of LBP.

Material and Methods

95 patients regularly visiting Orthopaedic department of Surabhi Institute of Medical Sciences,Siddipet and Mallareddy Institute of Medical Sciences, Suraram, Telangana State, India were included in the study.

Inclusive Criteria: Patients aged between 30 to 65 years having low back pain (LBP), radicular symptoms and neurogenic claudication not responding to symptomatic treatment for 4 to 6 weeks were selected for study.

Exclusion Criteria: The patients having osteoporotic fractures, traumatic lumbar spine fractures, patients younger than 30 years older than 65 years, having malignancy or infections of the spine were excluded. The patients having cardio-vascular or neurogenic diseases were also excluded from this study.

Method: After applying the exclusion criteria patients selected were evaluated thoroughly with both systematic clinical examination and investigations mentioned above. Conservative treatment was given initially and those who doesn’t respond to it in a reasonable period of time were subjected for the caudal epidural steroid injection. Caudal epidural injection was given under full aseptic conditions by keeping an anaesthetist as a stand by. The patients were asked to lay down in prone position, on radiolucent table. The gluteal region was prepped and draped from 4 cm above the proximal end of natal cleft. Needle was inserted straight through sacral hiatus. C-Arm image intensifier used to confirm the site of needle insertion. 20 G spinal needle was inserted into sacral hiatus and then directed into the sacral canal. Aspiration was done to confirm that that the needle did not pierce epidural blood vessels or the dura. Small amount of radiopaque water-soluble dye was injected through the syringe to confirm the needle was in the epidural space. Position of the needle in the sacral hiatus was also confirmed under C- Arm. 50 cc syringe containing 25cc of normal saline, 5cc of 2% lignocaine, and 80 mg of Depo-Medrol acetate was injected slowly. It was stop and go procedure. After the injection patient was turned into supine position and vitals were monitored for 5-10 minutes. Then patients were asked to move toes and legs actively to check their muscle power. The patients in whom bloody tap was encountered, the procedure was abandoned and postponed for at least a week.

The patients were discharged on the same day and instructed to lie in supine position for next 6 hours to prevent headache, nausea and vomiting. They were called after 24 hours to know about the pain and note any adverse effects. Later conservative treatment was continued simultaneously. Subsequent follow ups in OPD were done at one week, three weeks and three months intervals and were assessed on VAS (Visual Analogue Scale) score during the follow-up.

Duration of study was September-2020 to August-2022

Statistically: Types of LBP was classified as per MRI picture with percentage, study of duration of improvement as per VAS score was noted. Different complaints of the patients were classified with percentage, and different grades of VAS score also classified with percentage. The statistical analysis was done in the 2007 micro software. The ratio of male and female was 2:1.

Observation and Results

Table-1: VAS score study- grade-I had 34 (35.7%), grade-II had 44 (46.3%), grade-III had 44, grade-IV had 9 (9.1%) and grade-V had 8 (8.4%) patients.
Table-2: Classification of LBP as per MRI picture- 16 (16.8%) had acute annular lesions or no lesions, 14(14.7%) had lumbar spondylolisthesis, 26(25.5%) had lumbar canal stenosis, 40(42.1%) had degeneration of disc.

Table-3: Study of improvement as per VAS score (4-8)- 14 patients with acute back pain, 12 patients with lumbar spondylolisthesis, 13 patients with lumbar canal stenosis and 26 patients with degenerative disc disease improved at three months after treatment.

Table 1. VAS score study
Total No. of patients: 95

<table>
<thead>
<tr>
<th>VAS score rate grades</th>
<th>No. of Patients (95)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade-I</td>
<td>00</td>
<td>—</td>
</tr>
<tr>
<td>Grade-II</td>
<td>34</td>
<td>35.7</td>
</tr>
<tr>
<td>Grade-III</td>
<td>44</td>
<td>46.3</td>
</tr>
<tr>
<td>Grade-IV</td>
<td>09</td>
<td>9.4</td>
</tr>
<tr>
<td>Grade-V</td>
<td>08</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Grade-III has significant number patients & grade-V has least Low Back Pain (LBP) as per MRI study.

Table 2. Classification of low back pain as per MRI study
Total No. of patients: 95

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Diagnosis</th>
<th>Number of Patients</th>
<th>Percentage (%)</th>
<th>Complaints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Annular tears or no cause found-Acute LBP</td>
<td>16</td>
<td>16.8</td>
<td>Back pain</td>
</tr>
<tr>
<td>2</td>
<td>Spondylolisthesis</td>
<td>14</td>
<td>14.7</td>
<td>Claudication and LBP</td>
</tr>
<tr>
<td>3</td>
<td>Lumbar canal stenosis</td>
<td>25</td>
<td>26.8</td>
<td>Claudication</td>
</tr>
<tr>
<td>4</td>
<td>Degenerative disc disease</td>
<td>40</td>
<td>42.1</td>
<td>Back pain and leg pain</td>
</tr>
</tbody>
</table>

Degeneration of disc with or without root radiation had more complaints and spondylolisthesis has least number of complaints.

Table 3. Study of improvement as per VAS score on caudal Epidural steroid injection
Total No. of Patients: 95

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Diagnosis</th>
<th>At first visit</th>
<th>One week</th>
<th>After three weeks</th>
<th>At Three months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acute Back Pain</td>
<td>12-14 (16)</td>
<td>0-4 (16)</td>
<td>4-6 (16)</td>
<td>4-8 (14)</td>
</tr>
<tr>
<td>2</td>
<td>Spondylolisthesis</td>
<td>4-3 (14)</td>
<td>0-4 (4)</td>
<td>4-6 (14)</td>
<td>4-8 (12)</td>
</tr>
<tr>
<td>3</td>
<td>Lumbar canal stenosis</td>
<td>4-7 (25)</td>
<td>4-8 (17)</td>
<td>0.4 – 4.8 (13)</td>
<td>4-8 (13)</td>
</tr>
<tr>
<td>4</td>
<td>Degeneration of Disc</td>
<td>8-12 (40)</td>
<td>0-4/0-4 (34)</td>
<td>0-4 / 4-8 (26)</td>
<td>4-8 / 8-12 (26)</td>
</tr>
</tbody>
</table>

The degeneration of disc with or without root radiation had duration of treatment and more patients to treat while spondylolisthesis had least number of patients.
Discussion

Present study done mainly to know the role of caudal epidural steroid injection in the management of low back pain in Telangana Population. In the VAS score study 0 patients in Grd I, 34(35.7%) were in grade-II, 44 (46.3%) were in grade-III, 9(9.4%) in grade-IV, 8(8.4%) in grade-V (Table-1). Classification of LBP as per MRI study was 16(16.8%) had acute annular lesions or normal MRI, 14(14.7%) had spondylolisthesis, 25 (26.3%) had lumbar canal stenosis, 40 (42.1%) had degeneration of disc (Table-2). In the study of improvement as per VAS score on caudal epidural steroid injection at three months, 14 had improvement in Acute LBP, 12 had improvement in spondylolisthesis and 13 in lumbar canal stenosis and 26 patients improved with degeneration of disc (Table-3). These findings are more or less in agreement with previous studies (6)(7)(8)

The exact mechanism of action of epidurally injected steroid and local anesthetic is unclear. It can be hypothesized that steroid injection achieved neural blockade, which alters or interrupts nociceptive input reflex mechanism of the afferent fibers, self-sustaining activity of the neurons and patterns of the central neuronal activities (9). Corticosteroids reduce the inflammation by inhibiting either the synthesis or release of number of pro-inflammatory mediators and by causing a reversible local anesthetic effect (10). In contrast local anesthetics have been described to provide short to long term symptomatic relief based on various mechanisms.

The LBP could be due to excess release of neurotransmitters causing complex central responses including hyperplasia and phenotype changes which are considered as part of neuronal plasticity (11). The administration of steroid could be effective for short term and in some cases, steroids have long term potency. Hence efficacy of the steroid is unpredictable (12). Moreover, radicular pain can occur without disc herniation. Hence it is believed that radicular pain includes partial axonal damage, neuma formation focal demyelination, intraneural edema, impaired microcirculation, chemical irritation and inflammation around discs and nerve roots which generate the pain. Such pain was relieved by administration of steroid and local anesthesia but duration of relief is un-predictable.

Hence caudal epidural steroid injection is an effective surgery sparing procedure that should be a part of conservative care in the management of LBP and radiculopathy.

In evolutionary point of view vertebral column was like cantilever bridge which has modified into pillar to transmit the body weight of erect posture. Hence there was re-orientation of vertebral column. This re-orientation depends on environmental and nutritional status which leads to variations in adaption resulting in spondylolisthesis, herniation, and degeneration of disc because every part of the vertebra has individual and different function.

Summary and Conclusion

Present study is to know the role of caudal epidural steroid injection in the management of LBP. The procedure can be performed easily as a day care procedure, less technically demanding and with low complication rates compared with surgical treatment. Moreover, it is cost effective alternative approach to the management of LBP. But this study demands further embryological, genetic, anthropological, nutritional, bio-mechanical study because the exact factors and mechanism of formation of primary and secondary curvatures of vertebral column is still unclear.

Limitation of study Owing to tertiary location of research centres, small number of patients and lack of latest techniques, we have limited findings and results.

This research paper was approved by Ethical committee of Surabhi Institute of Medical Sciences, Siddipet & Mallareddy Institute of Medical Sciences, Suraram, Telangana state, India

Conflict of Interest: No

Funding: No

References

1. Manchikanti L. - Epidemiology of low back pain – Pain physician 2000,3,167-192
5. Sehgal N, Fortin JD. - Internal disc disruption and low back pain -Pain physician 2000,3, 143-157