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Role of Epidural Steroid Injection for Chronic Low Back Pain

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Abstract: ***Background: Epidural steroids refers to injection of corticosteroids mixed with local anaesthetic injected into the epidural space to relieve pain of spinal origin caused by inflammatory irritation. Epidural steroid injections are an established mode of conservative management working by spreading up and down the epidural space. We prospectively investigated the outcome of epidural steroid injections for Chronic low back pain patients. Material and Methods: A prospective study of 20 patients was enrolled in the study from January 2021 to June 2021. We included patients older than 18 years with history of chronic low back pain, discogenic pain, disc bulge and disc protrusion and radicular pain, spondylosis and spinal canal stenosis, not responding to medication and not willing for surgery. Patients were evaluated at baseline, three weeks, three months and six months using Objective Parameters of Straight Leg Raise test (SLRT) and Claudication distance and subjective parameters of pain using Numeric Pain Rating Scale (NPRS) and Disability using Oswestry Disability Index (ODI). Results: Among 20 patients (9 males and 11 females), post epidural injection their Mean NPRS and ODI improved in 6 months. Similarly Mean SLRT and Claudication distance improved. Change in NPRS, ODI and SLRT were statistically significant. Conclusion: Epidural steroid injections are an effective modality of treatment in managing chronic low back pain. They provide significant pain relief, improvement in functional status and facilitate return to work.***

Keywords: Chronic low back pain, Epidural injection, Methylprednisolone, Bupivacaine, Straight leg raise test (SLRT), Numerous pain rating scale (NPRS), Oswestry disability index (ODI).

1. Introduction

Epidural Steroids refers to the injection of corticosteroids, usually mixed with local anaesthetic+adjuvants, into the epidural space to relieve pain of a spinal origin caused by inflammatory irritation.[1] Low back ache is the most common problem seen in orthopedic clinic. Low back ache with lumbosacral radiculopathy remains the most challenging musculoskeletal problem for its therapeutic management.[2] Low back ache could be acute, subacute or chronic. Acute pain lasts for less than 4 weeks, subacute for 4-12 weeks while as chronic pain remains for more than 3 months. The cause of low back ache includes radiculopathy due to prolapsed disc, spinal stenosis, facet joint arthropathy and other underlying pathologies like rheumatoid arthritis, infections, fractures and tumors. Inflammation of nerve root is also an important factor for developing radiculopathy.[3, 4, 5]Various treatment modalities are available for patients having subacute or chronic low back ache with radiculopathy, one of the less invasive techniques being epidural steroid injection. Steroids reduce inflammation[6, 7] by inhibiting pro-inflammatory mediators like phospholipase A2, histamine etc and by the action of stabilizing hyper-excitable nerve membranes.

Objectives

To evaluate low back pain relief among adults following epidural steroid injection.

2. Material and Methods

A Hospital based prospective study was conducted among 20 adults above 18 years of age who presented with chronic low back pain to the out-patient department of Orthopaedics at GSL Medical College, Rajahmundry, for a period of six months (JAN2021 to JUN2021). Patients were evaluated at baseline, three weeks, three months and six months using Numeric Pain Rating Scale (NPRS) and Disability using Oswestry Disability Index (ODI).

Inclusion Criteria

1) The patients above 18 years of age treated by only nonoperative methods.
2) Symptomatic patients with disc protrusion and prolapse with positive MRI findings.
3) Patients who would be available for follow up for minimum of 6months.
4) Chronic low backache with radiculopathy
5) Patients willing for steroid injection.

Exclusion Criteria:

1) Patients below 18 years.
2) Patients with Extruded and sequestered discs
3) Patients with progressive neurological deficits.
4) Patients with associated listhesis, instability of the spine.
5) Patients with cauda equina lesions.
6) Patients with history of previous spine surgery
7) Patients with multilevel degenerative spine disease
8) Patients allergic to the myelography contrast, steroid, and local anesthetic agent
9) Any systemic infection or local infection at the injection site
10) Patients not giving consent for the procedure.

Ethical clearance from Institutional Ethical Committee of GSL Medical College, was obtained before initiating the study. Prior to the commencement of the study, the

procedure was explained to the patient and informed consent was taken from the study participants after explaining the purpose of the study in vernacular language in an understandable manner.

Data Collection

All the patients who presented to orthopedic outpatient and satisfied the inclusion criteria were considered for the study. A total of 28 cases of chronic low back ache came to orthopedic OPD during the study period, among which 3 did not satisfy inclusion criteria and 5 did not gave consent for study. Hence, 20 patients were taken into consideration for study.

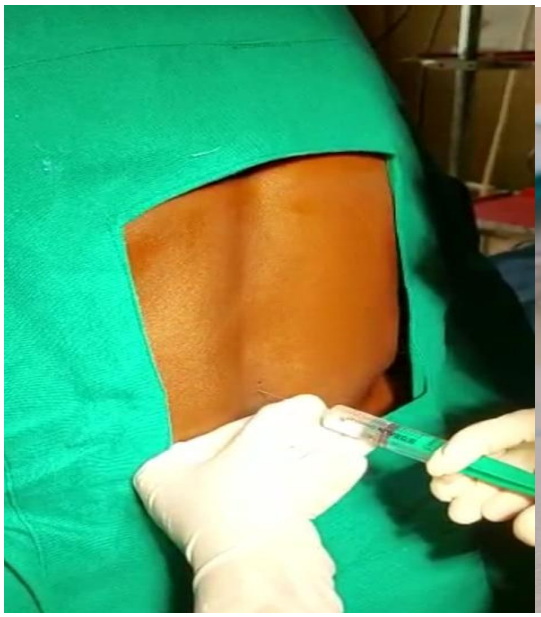
Procedure:

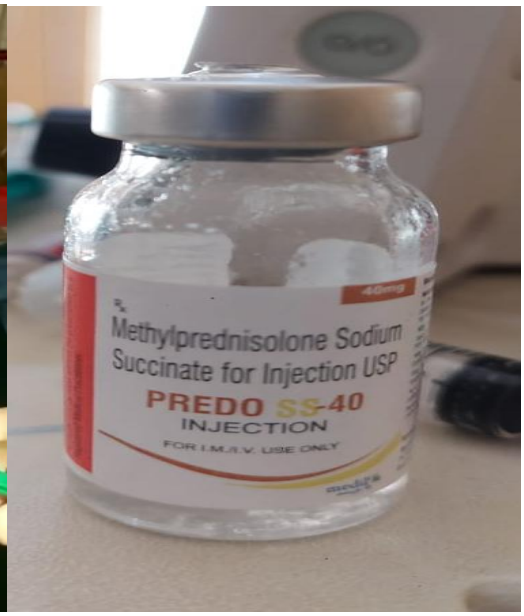
Initial Assessment: Patients were assessed clinically, a thorough history and clinical examination was carried out. The subjective symptoms and objective signs were recorded in a pre-designed proforma. XRAY-LS SPINE and MRI of the LS SPINE was performed for all the patients to rule out the other causes. Once the criterion was met, epidural steroid injection was given. Then patients were followed for a period of 6months. Assessment of functional outcome was done both before and after steroid injection, at 3 weeks, at 3months and 6months interval.

Injection of Epidural Steroid:

All the patients included in the study were selected randomly with chronic back pain with radiculopathy, with MRI proven lumbar disc prolapse at one or different levels not responding to conservative treatment i.e.; NSAIDS, antidepressants, oral steroids, muscle relaxants, TENS (Trans-cutaneous electric nerve stimulation) and physiotherapy. Epidural steroid injections are given by 3 routes; transforaminal approach, caudal approach and interlaminar approach.

We preferred interlaminar approach in our patients as this approach is easy for both patients as well as the doctor and delivers drug closer to the site of pathology. All the patients planned for the injection were kept fasting 6 hours prior to the procedure after proper lab investigations and Pre-anaesthetic check-up. All resuscitative machines and anaesthesia equipments were kept stand by to be ready for any possible adverse reaction. An 18 G intravenous cannula was used for venous access and ringer lactate was started. The procedure was done in sitting position in the operation theatre. Under aseptic precautions, disc level was located by surface anatomy without any fluoroscopy guidance. Two cc of 2% lignocaine was infiltrated in the skin and subcutaneous tissues. An 18G epidural needle was inserted in the midline with the bevel upwards and the stylet in position between the spinous processes at the desired level. Interspinous ligament was pierced and needle advanced with 'loss of resistance' being carried out at intervals. Just after penetrating ligamentum flavum, the epidural space was entered and 'loss of resistance' test was positive. Then 40mg of reconstituted Methylprednisolone was injected into the epidural space along with 2ml of 0.5% bupivacaine. After the procedure, the patient was kept under observation for 30 minutes with multiple channel monitoring (MCM). Patient was checked for any motor or sensory block and then was shifted to ward. Patient was advised to lie in supine position for 24 hours and was given orally tablet cefuroxime 500mg twice daily along with tablet diclofenac 75mg for two days during the post injection period. Patient was kept admitted in the hospital for the night and discharged next day. Follow-up was done at 3 weeks, 3 months and 6months. Patient was assessed for lower back and lower extremity pain on the basis of NPRS score from 0 (no pain) to 10 (worst pain possible). If a patient subjectively reported a decrease in pain in next follow-up, no more injections were administered.



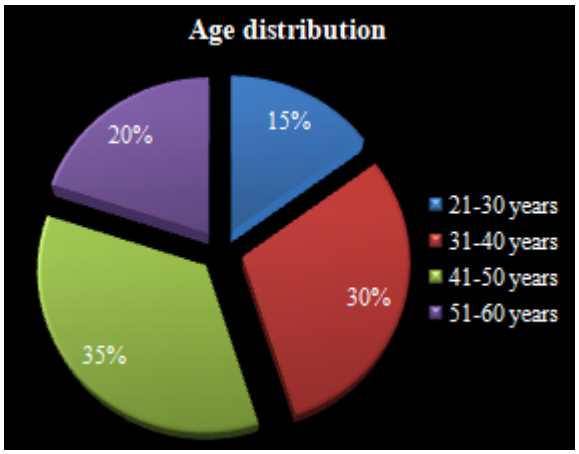


Statistical Analysis

Data extraction and analysis was done using Microsoft Excel 2007 and SPPS VERSION 20. Results were expressed as percentages for categorical variables. Continuous variables were expressed as mean and standard deviation. ANOVA test was used to compare the means of different continuous variables. All P values <0.001 were considered as statistically significant.

3. Results

Age wise distribution of study subjects (n=20)



A total of 20 patients of chronic low back pain were evaluated. About 3 (15%) belonged to 21-30 years age group, 6 (30%) belonged to 31-40 years age group, 7 (35%) belonged to 41-50 years age group and 4 (20%) belonged to 51-60 years age group. Females constituted majority i.e., 11 (55%) while males were 9 (45%). Mean age of the subjects in this study was 41.4 years ±10.7 Mean age of the patients in low back ache patients in a study by Wiesel SW[14] is 43 years, while in a study by Baldwin NG mean age is of 34.96 years[15]. In the present study, majority 13 (65%) of the subjects were aged 31-50 years and 3 (15%) were below 30years.

Table 1: Mean NPRS Score

Variables	Before Injection	At 3 weeks	At 3 months	At 6 months
Mean	6.95	1.85	1.5	1.4
Standard Deviation	1.05	1.13	1.23	1.04

p value is <0.001 which is significant

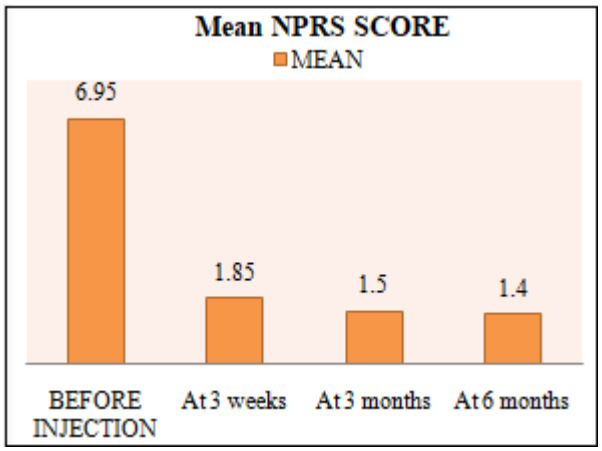
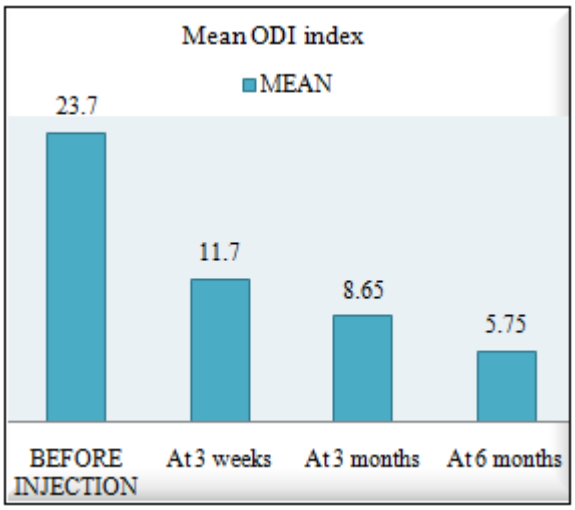


Table 2: Mean ODI Index

Variables	Before Injection	At 3 weeks	At 3 months	At 6 months
Mean	23.7	11.7	8.65	5.75
Standard Deviation	6.82	3.79	3.19	3.09

p value is <0.001 which is significant



4. 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. There are several types of steroids available for epidural injection like hydrocortisone, betamethasone, triamcinolone and methylprednisolone. Due to its anti-inflammatory properties[8] and long duration of action, we have used methylprednisolone in our patients. It also stabilizes neural membranes and suppresses ectopic neural discharges[9]

5. Conclusion

The study concludes that epidural steroid injection is a safe, cost effective and minimally invasive method of treating patients of chronic low back ache due to herniated disc. We recommend epidural steroid injection as an effective mode of treating LBA with radiculopathy in patients not responding to conservative methods of treatment.

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