

Epidural Steroid Injection in the Management of Patients with Subacute or Chronic Low Back Ache with Radiculopathy due to Herniated Disc

Irfan Andleeb Gul¹, Tabish Tahir Kirmani², Mohammad Shahid Bhat³, Zahid Andleeb Gull⁴

ABSTRACT

Introduction: Low back ache is the most common problem seen in orthopedic clinic. Low backache with lumbosacral radiculopathy remains the most challenging musculoskeletal problem for its therapeutic management. In around 90% patients, the cause of low back with radiculopathy is a prolapsed disc. Epidural steroid injections are used in the management of patients with subacute or chronic low backache with radiculopathy, not responding to conservative treatment. The aim of study was to check the efficacy of epidural steroid injection in patients of subacute or chronic low backache with radiculopathy due to herniated disc.

Material and Methods: The study was conducted over 100 patients reporting to our OPD with chief complaints of LBA with radiculopathy, not responding to conservative treatment. Maximum of three epidural steroid injections were given with two weeks of interval in between. The patients were assessed before and after the procedure and assessment was done using VAS scoring system.

Results: In our study, 80% patients got a significant improvement in symptoms according to VAS scoring system. Out of them, 70% improved with only a single dose of ESI, 20% with the second dose and the remaining 10% after third dose. Also the procedure was found to be more effective in treating patients of subacute low backache with radiculopathy rather than the chronic one.

Conclusion: ESI is a safe, cost effective and minimally invasive method of treating patients of subacute or chronic LBA with radiculopathy due to herniated disc. The procedure decreases analgesic use and allows early return to work.

Keywords: Epidural Steroid Injection, Low Backache, Herniated Disc, Visual Analogue Scale

and tumors etc. Nerve root compression by the herniated disc is thought to be the cause of radiculopathy. But radiculopathy can occur in absence of nerve compression⁴. Inflammation of nerve root is therefore thought to be an important factor for developing radiculopathy^{5,6,7}.

Various treatment modalities are available for the treatment of patients having subacute or chronic low back ache with radiculopathy, one of the less invasive techniques being epidural steroid injection. 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 radiculopathy⁸. Use of epidural steroid injection for the treatment was first reported in 1953⁹. Steroids reduce inflammation^{10,11} by inhibiting pro-inflammatory 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 procedures¹². However, there are reports of serious complications such as arachnoiditis and meningitis¹³. The aim of study was to check the efficacy of epidural steroid injection in patients of subacute or chronic low backache with radiculopathy due to herniated disc.

MATERIAL AND METHODS

The study was conducted in the department of orthopedics from May 2017 to February 2018, after ethical approval, at Hamdard Institute of Medical Sciences and Research, New Delhi where 100 patients were taken for the study. Proper informed consent was taken from patients before start of study.

INTRODUCTION

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 management¹. Radiculopathy may be defined as the pain distributed along the dermatomal distribution of a spinal nerve root, caused by direct affection of nerve tissue. 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. In around 90% patients, the cause of low back with radiculopathy is a prolapsed disc^{2,3}. Other causes include spinal stenosis, facet joint arthropathy and other underlying pathologies like rheumatoid arthritis, infections, fractures

¹Senior Resident, Department of Orthopaedics, Hamdard Institute of Medical Sciences and Research, New Delhi ²Senior Resident, Department of Orthopaedics at Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, ³Senior Resident, Department of Orthopaedics, GS Medical College and Hospital, Uttar Pradesh, ⁴MBBS Intern, Dhaka National Medical College, Bangladesh

Corresponding author: Irfan Andleeb Gul, Room No. 104, Block D, AMHR Hostel, Hamdard, Delhi, India

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Inclusion criteria

- Age above 18 years of both sexes
- Subacute or chronic low backache with radiculopathy
- MRI proven lumbar disc prolapse.

Exclusion criteria

- Hypersensitivity to the substances being injected
- Any systemic infection or local infection at the injection site
- Patients presenting with cauda equina syndrome
- Patients on anti-coagulation therapy or having any bleeding disorder
- Patients with congestive heart failure or uncontrolled blood sugars
- Spinal deformity or history of previous spinal surgery
- Pregnant females or ongoing breast feeding females
- Patients with underlying malignancy
- Patients not giving consent for the procedure.

MATERIAL AND METHODS

All the patients included in the study were selected randomly with either subacute or 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 patient 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 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 all 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 80mg of reconstituted Methylprednisolone was injected into the epidural space along with 10ml 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 2 weeks, 4 weeks and 3 months. Patient was assessed for lower back and lower extremity pain on the basis of VAS 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. If the patient reported slight decrease in pain or no relief, second injection was given in the similar manner and patient called for the next follow-up after 2 weeks. Again assessment was done based on VAS score at next follow up at 4 weeks and third injection was given, if found necessary. Maximum of three injections were given. Patients of low back ache with radiculopathy not responding to even three doses of epidural steroids were considered for surgery.

RESULTS

In our study, 80% patients got a significant improvement in the symptoms, according to VAS scoring system (Figure-1). All these patients were satisfactory with the treatment. Rest of the 20% got little or no relief at all, even after 3 doses of epidural steroid injections. Out of the 80 patients who got significant improvement, 70% (56 patients) improved with only 1 injection and 20% (16 patients) with the 2nd dose. The remaining 10% (8 patients) were satisfactory only after the 3rd dose. All this is depicted in Figure-2. At final follow up of 3 months, 15 patients reported again increase in pain among previously treated 80 patients. Thus, the overall success rate

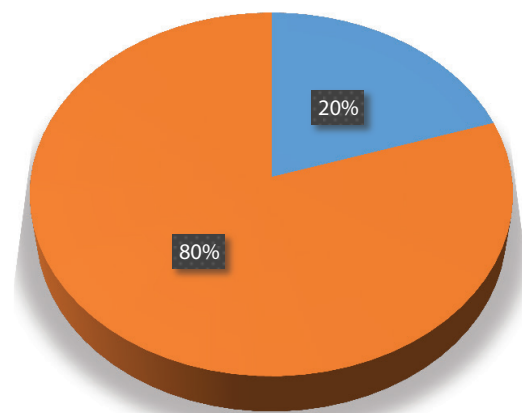


Figure-1: Chart showing 80% percent patients improved with ESI

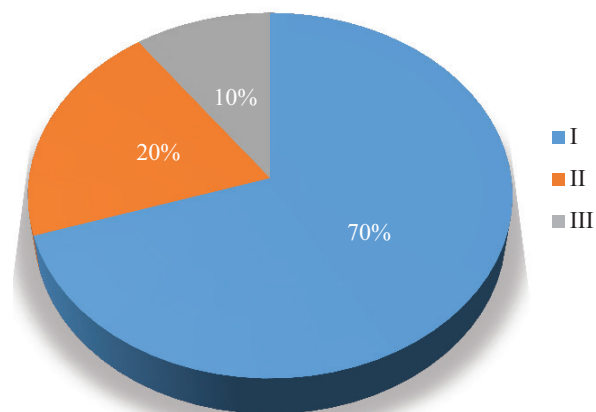


Figure-2: Chart showing percentage of patients improved after 1st, 2nd and 3rd dose of ESI

in our study was 65%.

We retrospectively extended our study in all our patients and found that 85% (68 patients) who got improvement had subacute pain while only 12 patients (15%) had chronic pain. From this, we inferred that this procedure is more effective in treating patients of subacute low backache with radiculopathy rather than the chronic one.

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. However, a few patients had localized pain at the injection site and headache, which subsided without any treatment. There are several types of steroids available for epidural injection like hydrocortisone, betamethasone, triamcinolone and methylprednisolone. Due to its anti-inflammatory properties¹⁴ and long duration of action, we have used methylprednisolone in our patients. It also stabilizes neural membranes and suppresses ectopic neural discharges¹⁵.

Regarding the volume of injectate, Winnie et al have found that high volumes have no benefit over the low volume¹⁶. However, it was found that the minimal volume should not be less than 4 ml. The more volume of drug helps in flushing the inflammatory mediators and breaks the adhesions too¹⁷. Several studies are in favour of epidural steroid injection in LBA with radiculopathy. According to Bogduk, out of 40 studies carried out on more than 4000 patients regarding epidural steroid injections, 36 studies recommended their use in the treatment¹⁸. Another study carried out by A. Wani et al¹⁹ over 150 patients with a follow up of 2 years, found overall success rate of 69%. Epidural steroid injection has also been recommended by the North American Spine Society and Agency for Health Care Policy and Research for the management of low back ache with radiculopathy. Blankenbaker DG et al and Sharma S et al carried out two different individual studies and found that the success rate depends upon the duration of back pain. For duration of less than 3 months, the success rate is 83-100%, and the success rate declines as the duration of symptoms increases^{20,21}. White et al carried out a prospective study over 300 patients and reported good results in early periods which decreased with time. They reported 82% pain relief for one day, 50% for two weeks and 16% for two months. For this therapeutic delay, many physicians recommend multiple injections. At therapeutic level, the local effect of steroids has been found to last at least 3 weeks. The acceptable time interval between two injections is still a matter of debate. In our study, the interval between two injections was 2 weeks.

CONCLUSION

The study concludes that epidural steroid injection is a safe,

cost effective and minimally invasive method of treating patients of subacute or chronic low back ache due to herniated disc. The procedure is more effective in treating patients of subacute LBA with radiculopathy rather than with the chronic one. The procedure decreases analgesic use and allows early return to work. 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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