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Original Research Article

Cervical Interlaminar Epidural Injection: A Safe Technique

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ABSTRACT

Background: Chronic neck pain and radiculopathies can cause profound disabilities in physical and psychological health. Numerous studies that link inflammation to the main cause of neural irritation and injury have supported the use of steroids in the epidural area for the treatment of radiculopathy. Routinely, cervical interlaminar epidural steroid injection is given in prone position. However, we experienced patients are not comfortable during the procedure. So, in our study, we conducted the procedure in lateral decubitus position under IITV guidance.

Methods: All the patients who came to OPD in department of Orthopedics were screened and patients having neck pain with or without radiculopathies were further investigated with MRI cervical spine with whole spine screening. From these patients, those having pathologies like degenerative disc disease, disc prolapse, facet arthritis were selected for study.

Results: In our study female preponderance is seen. Majority of patients were in middle age group. Around 18% of the patients had degenerative disc disease, 12% had facet arthritis, 42% had prolapse of intervertebral disc with right side radiculopathy and 28% had prolapse of intervertebral disc with left side radiculopathy.

Conclusion: Cervical interlaminar epidural injection in lateral position using fluoroscopy is a safe and effective method.

Keywords: Cervical radiculopathy, Cervical epidural, Interlaminar injection, Safe cervical injection

INTRODUCTION

Chronic neck pain and radiculopathies is not a life threatening condition but can cause profound disabilities in physical and psychological health.[1] With the increase in life expectancies, treatment of chronic spinal pain has become a major issue. Because of growing neck pain prevalence and technical advances in the treatment, nonsurgical intervention for spinal pain has rapidly increased.[2] Epidural steroid injection (ESI) delivers drugs directly into the epidural space under fluoroscopic, computed tomography (CT), or combined CT-fluoroscopic guidance and relieves pain originating from degenerative spine disorders or disc herniations. Several meta-analyses have shown that, for managing chronic neck pain, ESI has been rated as good to fair on the U.S. - Preventive Services Task Force grading system and as level II or III of evidence-based practice on the American Society of Interventional

Pain Physicians grading of evidence system.[3–5] These ratings are made on the basis of evidence obtained from at least one randomized controlled trial or one relevant high-quality nonrandomized trial. However, some researchers have concluded that there is no evidence for the efficacy of ESI in management of chronic neck pain except in cases of radicular pain associated with disc herniation.[6,7] This inconsistency could be due to the complexity of chronic spinal pain and the variability in patient selection, injection techniques, and outcome assessment.[7]

Several investigations that have later implicated inflammation as the primary source of neural irritation and injury have supported the use of steroids in the epidural region for the treatment of radiculopathy, which at the time seemed relatively obvious.[8-10] Many anesthesiologists believed for many years that the cervical interlaminar epidural procedure was too dangerous for normal usage, in part because of the early issues with epidural anaesthesia in the neck and the close proximity of the ligamentum flavum to the spinal cord.[11,12] Compared to 5.0 to 6.0 mm at L2, this gap is just 1.5 to 2.0 mm at C7.[13]

Cervical epidural injections are frequently used as adjuncts to non-surgical care of cervical radicular pain as experts investigate non-operative treatment options before resorting to surgery.[14,15] However, there is still a dearth of research defending cervical epidural injections. There is a limited amount of information in the literature on the cervical interlaminar epidural procedure, results, and problems.

There are now differences in almost every element of cervical epidural injections, including the injectate type and amount, the technique, and the use of contrast and fluoroscopy. We propose cervical epidural interlaminar injection in lateral decubitus position under image intensifier guidance, as in prone position, patient and surgeon both are uncomfortable. Without the use of IITV, accuracy of the injection cannot be ascertained due to high false positive loss of resistance in cervical spine.

Few previous studies have shown that cervical interlaminar epidural injection in lateral position using fluoroscopy is a safe and effective method with low complication rate, low radiation dose, short procedure time and increased acceptance of the procedure by the patients as well as doctors. But there are very few studies done and reported on cervical epidural interlaminar injection in lateral decubitus position. Hence, this study was carried out to describe this technique and evaluate its clinical outcome.

Objectives of the study

a) To describe a safe, effective and comfortable technique for doing cervical interlaminar epidural injection.
b) To evaluate the clinical outcome of cervical interlaminar epidural injection.

MATERIAL AND METHODS

Study site and duration

This study was done in a medical college hospital from 1st October 2021 to 31st March 2022.

Study population

Patients attending OPD in department of Orthopedics with neck pain or upper limb radiculopathies with MRI proven cervical disc prolapse, degenerative disc disease or facet arthritis

Study design

Descriptive Prospective study

Methods of collection of data

Patient selection

Inclusion Criteria: Patients coming to OPD with neck pain or upper limb radiculopathies with MRI proven cervical disc prolapse, degenerative disc disease or facet arthritis were included in the study.

Exclusion Criteria: Patients with cervical cord edema on MRI and patients not giving consent for the procedure were excluded from the study.

All the patients coming to OPD were screened and patients having neck pain with or without radiculopathies were further investigated with MRI cervical spine with whole spine screening. From these patients, those who had pathologies like

degenerative disc disease, disc prolapse, facet arthritis and exhausted conservative trial were selected for study. Total 50 patients were part of this study.

Surgical technique

All the patients were investigated with Random blood sugar, Complete blood count and Prothrombin time and international normalized ratio. Procedure was performed only if all the reports were within normal limit. The procedure was performed inside operation theatre under image intensifier guidance.

Patient was placed in lateral decubitus position with affected side down. Head was supported with bolster so that neck of the patient remains straight during the procedure. Patient was asked to flex the neck as much as possible without tilting the neck side by side so that interspinous distance increases. IITV was kept on face side of the patient (Fig. 1).

Patient was pre-medicated with antibiotic and antacid injection through intracath. Vitals of the patient were monitored throughout the procedure.

Figure 1: Patient in lateral decubitus position with affected side down

Scrub nurse prepared the sterile trolley with whole sheet, sponge holding forceps, small bowl, betadine, gauze pieces, one 5 ml syringe with 2% xylocaine, one loss of resistance syringe, one 10 ml syringe containing 1ml of injection triamcinolone acetate, 1ml of tramadol, 8 ml of distilled water and one 2ml syringe with omnipaque dye, spinal needle no. 20, sterile gloves etc.

Painting and draping was performed. Level of the pathology was marked under IITV guidance and injection xylocaine 2% was given in subcutaneous area on marked place. After waiting for 2 minutes, the epidural needle no. 18 was inserted under IITV guidance till mid spinous level. After this stellate was removed and loss of resistance syringe was attached. Once the LOR is achieved, position of the needle is confirmed in both anteroposterior and lateral view under IITV guidance (Fig. 2, 3).

If the position of the needle was appropriate then it was confirmed with dye insertion and was checked with IITV. After confirming the proper dye spread, drug was given slowly and vitals were monitored. After insertion of the drug, patient was kept in same position for 10 minutes and one 500 ml of normal saline was given to the patient over one hour. After one hour, patient was allowed to go home.

Figure 2: Anteroposterior view under IITV guidance to confirm position of needle

Patient was followed up at 3 weeks, 3 months and 6 months. Patients with partial relief at 3 weeks were given repeat injection up to maximum of 3 injections. Patients with complete relief of pain at 3 weeks were started with physiotherapy at 3 weeks and followed up for 6 months.

Figure 3: Lateral view under IITV guidance to confirm position of needle

Statistical analysis: Collected data were entered in excel software and statistical analysis was performed. Frequency and percentage (%) for qualitative data were calculated. Data were presented with pie charts.

Ethical consideration: This study proposal was submitted and clearance was sought from the ethical committee of the institute.

RESULTS

In our study, Female preponderance is seen. Number of female patients were 31 (i.e. 62%) and male were 19 (i.e. 38%) as evident from Figure 4.

In our study, more number of patients affected were in age group of 51 years -75 years and least number of patient affected were in age group of 0-24 years as seen in Figure 5.

Figure 6 shows that, in our study, 18% of the patients had degenerative disc disease, 12% had facet arthritis, 42% had prolapse of intervertebral disc with right side radiculopathy and 28% had prolapse of intervertebral disc with left side radiculopathy.

In our study, most commonly affected level is C4-C5 (38%), least commonly affected level is C5-C6 (30%) as evident from Figure 7. Only 11 patients were given 2 repeat injections i.e. total 3 injections, 8 patients required only 1 repeat injection and remaining 31 patients did not require repeat injection. In Our study, only one patient developed post procedure complication. Patient developed postdural puncture headache which got resolved after conservative management. This shows that there are almost negligible complications with this technique. Hence, this technique is safe and also effective. In lateral decubitus position, patients and also the surgeons were more comfortable than the normal prone position.

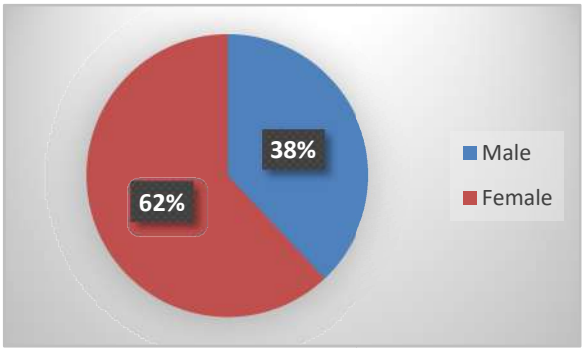

Figure 4: Distribution of participants according to sex

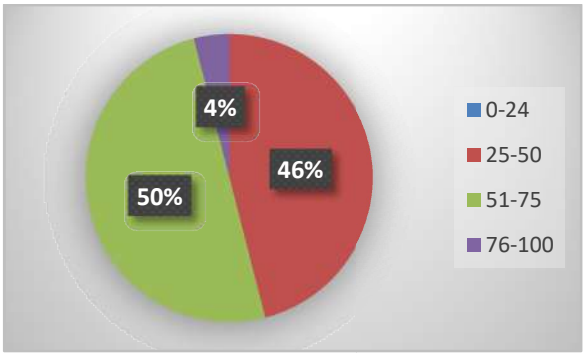

Figure 5: Distribution of participants according to age group in years

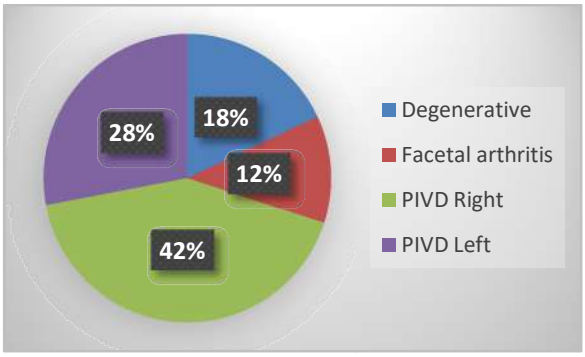

Figure 6: Distribution of participants according to diagnosis

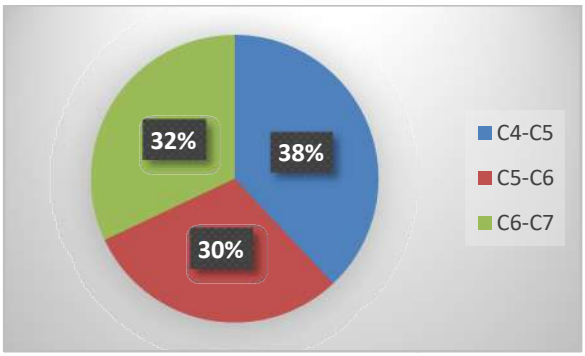

Figure 7: Distribution of participants according to diseased disc level

DISCUSSION

Since 1985, researchers have examined cervical epidural steroid injections.[16] It is still unclear what causes the local anaesthetic and steroid injections given epidurally to work the way they do. The pattern of central neuronal activity, self-sustaining activity of the neurons, reflex mechanism of the afferent fibres, and nociceptive input are thought to be altered or interrupted by the neural blockade. Further, corticosteroids have been shown to reduce inflammation by inhibiting either the synthesis or release of a number of pro-inflammatory mediators and by causing a reversible local anesthetic effect.[17] A common problem encountered with any epidural injection is inaccurate needle placement, leading to inaccurate placement of the injectate.[18] Because of this, those who support using fluoroscopy to guide epidural steroid injections urge doing so to ensure that drugs are delivered to the right intervertebral space.[19] In a study of 38 interlaminar cervical epidural steroid injections, they found a 53% rate of false loss of resistance during the first attempt to enter the epidural space. Additionally, it was demonstrated that no matter the volume or neck flexion angle employed, the contrast consistently fills the dorsal cervical epidural space bilaterally when cervical epidural steroid injections are done in the midline at C6/7 and C7/T1 under fluoroscopy.[20]

In our experience, patient is very uncomfortable in prone position while doing cervical epidural injection. Apart from this, incidental local anaesthetic injection into the spinal cord can cause serious complications like convulsions, unconsciousness etc. So, we propose not to use local anaesthetic in cervical epidural injectate. When we inject the drug in the epidural space, there are chances of hypotension in the patient, for this we loaded every patient with 500 ml of normal saline. It is difficult to palpate thin cervical ligament flavum with no. 18 epidural needle, therefore we used no.20 spinal needle. Using fluoroscopy further makes the procedure safe and effective.

CONCLUSIONS

Cervical interlaminar epidural injection in lateral position using fluoroscopy is a safe and effective method. Our technique will further decrease the complication rate of the procedure and will increase the acceptance of the procedure by the patients as well as doctors.

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