

## Evaluation of Chronic Back Pain Improvement after Single Dose of Epidural Steroid Plus Lignocaine Injection in both Genders at a Tertiary Care Hospital, Karachi

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### Abstract

**Objective:** To evaluate chronic back pain improvement after single dose of epidural steroid plus lignocaine injection in both sexes.

**Methods:** A consecutive cases series of 65 patients having age of  $\geq 18$  to 80 years and of both sexes from one institution were retrospectively studied. The study was conducted from January 2011 to July 2013. It was designed to evaluate the pain improvement after single dose of epidural steroid plus lignocaine injection with lumbar interlaminar technique in chronic back pain patients. Patients were divided into two groups, to assess the effectiveness of pain relief following the injection in between different age groups with Magnetic Resonance Imaging (MRI), evidence of lumbar disc prolapse and non-responder to oral medication were included. Those having red-flags (neurosurgical deficit) for surgical intervention were excluded from the study. Chronic back pain patients were treated with single dose of lumbar interlaminar epidural steroid plus lignocaine injection. Follow-up visits were carried out to assess pain reduction by patient perception as well as decrease requirement of oral medication.

**Result:** Out of all 65 patients, 28 were male. Mean age of  $50.04 \pm 14.26$  range 18-80 years. After the epidural steroid plus lignocaine injection, all patients of both the groups showed decrease in pain severity, evidenced by both patient perception and decrease requirement for oral medication. There was no gender difference. Two patients needed second injection after interval of 6 months. One female developed spinal anaesthesia after the injection, who recovered within 1 week.

**Conclusion:** This study concludes that epidural injection of steroid plus lignocaine is effective and safe in relieving chronic back pain in both sexes.

**Keywords:** Steroids, anesthetics, back pain, injections,

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### Introduction

Back pain may be characterised by a dull ache, a shooting piercing pain, or a burning sensa-

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tion. Acute pain lasts up to 12 weeks and chronic pain that persists beyond 12 weeks. Chronic back pain is one of the most common of all chronic pain disorders and has significant implication<sup>1</sup>. Annual prevalence of low back pain in elderly ranges from 15 to 45%<sup>2</sup>. Chronic back pain is a multifactorial disease with many possible aetiologies<sup>3</sup>, which include intervertebral discs, facet joints, hypertrophic ligament (ligamentum flavum), fascia, and muscles. The mechanical compression and inflammation of the nerve root seems to be an important factor in

the pathophysiology of radicular and discogenic pain<sup>4,5</sup>. In general, patients with chronic back pain may have a disturbed routine and hindrances in social and occupational activities.

Patients, who are refractory to conservative management, may require surgical intervention<sup>6</sup>. The primary aim of any surgical intervention is to provide rapid relief from pain and resolution of functional disability<sup>7</sup>. Therefore, anti-inflammatory drugs are used to reduce pain by reducing the inflammation around the nerve<sup>8</sup>. Several minimally invasive anti-inflammatory treatments are available such as segmental epidural steroid injections, selective nerve root blocks, laser discectomy and radio frequency ablation (nucleoplasty).

Three different approaches have been used to reach the lumbar epidural space, namely, interlaminar, transforaminal and caudal. Interlaminar and transforaminal are the frequently practiced approach to treat chronic back pain.

Epidural injection of corticosteroids is one of the most commonly used interventions to control chronic spinal pain<sup>9</sup>. There is a significant reduction in surgical intervention after treatment with epidural injection. Studies have been done in Pakistan<sup>10</sup>, however, no study addresses the issue of gender.

The purpose of the present study is to evaluate chronic back pain improvement after single dose of epidural steroid plus lignocaine injection with lumbar interlaminar technique in both genders.

## Patients and Methods

This is a retrospective observational study. It was designed to evaluate the efficacy of epidural steroid plus lignocaine injection with lumbar interlaminar technique in chronic back pain patients. The efficacy is defined by decrease in back pain severity for the period of at least 6 weeks after epidural steroid plus lignocaine injection. We included all patients of 18 to 80 years and above age and of both sexes. Patients were divided into two groups, A and B, to assess the effectiveness of injection in terms of pain improvement between different age groups. Group A includes all patients between 18 to 50 years and group B includes all above 50 to 80 years of age. For this study, we re-

corded patients who visited the outpatient department of neurology at Baqai Medical University Hospital, Nazimabad, from January 2011 to July 2013. All the patients were informed about the epidural steroid injections and written informed consents were obtained.

Patients with lumbar radiculopathy and chronic backache with magnetic resonance imaging evidence of single level disc prolapse at L4-5 or L5-S1, and non-responding to oral medication for more than 12 weeks were included in this study. Those having red-flags for surgical intervention such as neurological deficit, subsequent deterioration on follow-up, or cauda equina syndrome were excluded from the study.

Each patient was seen by a neurosurgeon before performing epidural steroid injection procedure in the operation theatre. Patient was asked to sit and assume forward flexed position on the operation table. The skin on the low back area was cleaned and then numbed with 2 mL, local anaesthetic agent 2% lignocaine. Level L3-L4 was identified and an 18-gauge Tuohy needle was inserted into the skin and directed toward the epidural space, using the loss-of-resistance technique. The needle penetrates the skin, subcutaneous tissue, supraspinous ligament and the ligamentum flavum, to reach the epidural space. Once the needle was in the proper position, ten ml of epidural steroid solution containing a mixture of 3mL of 2% lignocaine, 1mL of 40 mg triamcinolone acetonide and 6mL normal saline was injected. Finally, the needle was then withdrawn, and pressure was maintained at the injection site to prevent bleeding. Following the injection, the patient was monitored for 20 minutes before being discharged. In case of non-responder to single shot of epidural steroid plus lignocaine injection, a second injection was given in same manner to relieve back pain after 6 months.

Regular follow-up of patients up to 18 months was carried out during the study. The follow-up consisted of observation of short term and long-term efficacy. Short-term efficacy was defined as the improvement in backache symptoms over a period of 6 weeks. Long-term improvement was defined as the improvement in backache symptoms over a period of 6 months or more. The following questions

were asked from each patient before and after the epidural steroid injection to assess the short- and long-term efficacy in backache improvement: (i) Are you having back pain that interferes with activities of daily living? (ii) Are you interested in application of epidural injection? (iii) Did you feel relief from back pain after epidural injection? (iv) Did you have any of the following complications? (v) Did you feel any numbness in the lower limbs? (vi) Did you feel any weakness in the lower limbs?

Follow-up for complications of the injection and the procedure was observed during the study. Epidural steroid plus lignocaine injection are commonly well-tolerated among patients. Major and minor complications are usually seen related to technical problems during the procedure or reaction to steroid injection. List of major complications are bleeding, infection, epidural haematoma, nerve root injury, and very rarely paralysis of lower limbs. Minor complications are allergic reaction, transient extremity numbness or tingling, dural puncture causing positional headache, transient back or lower extremity pain, side-effects of steroids (transient flushing/hot flashes, fluid retention, weight gain, elevated blood sugars, and mood swings).

Demographic information, previous medical history, duration of symptoms, imaging performed, medication and other treatment of all patients were recorded. Statistical analysis was performed to establish the outcome based on follow-ups.

## Results

Sixty-five chronic backache patients from one institution were included in the study. Males were n= 28 (43%) and females n= 37 (56.9%). Mean age of 50.4 ± 14.26 range 18-80 years. Group A consist of n= 37 (56.9%) patients and group B n= 28 (43%) patients. Table 1 shows the age and sex distribution.

After the epidural injection, out of 65 selected cases, n= 62 (95.3%) patients in group A and B showed short-term benefit, but only n= 03 (4.6%) patients did not show short-term benefit in back pain improvement. These include 02 from group A and 01 patient from group B, as shown in table no. 2. On the other side, all patients in group A and B showed long-term benefit in back pain improvement.

Therefore, there was no age-related difference seen in both groups for the effectiveness of epidural injection in short- or long-term back pain improvement.

No gender difference was also found in managing back pain with single shot of epidural steroid plus lignocaine injection with lumbar inter-laminar technique in both groups.

During the 18-month follow-up, n= 62 (95.3%) of patients of both the groups showed decrease in pain severity evidenced by both patient's perception and decreased requirement for oral medication.

Two out of 3 patients from group A needed a second injection therapy after 6 months. One female patient from group B had developed a complication of spinal anaesthesia after the injection, who completely recovered within 1 week.

Table 1. Age and sex distribution in patients with chronic back pain at the outpatient department of neurology of a tertiary care hospital of Karachi

Age (Years)	Male	Female	Total	%
<50 (18-49)	15	22	37	56.9
>50 (50-80)	13	15	28	43
Total	28	37	65	100

Table 2. Patients showing therapeutic response after epidural steroid plus lignocaine injection

Groups	Total	%	Patients with improvement		Patients with no improvement	
			n	%	n	%
A	37	56.9	35	94.5	2	5.4
B	28	43	27	96.4	1	3.7
Total	65	100	62	95.3	3	4.6

## Discussion

The aim of this study was to evaluate perception of pain reduction after epidural steroid plus lignocaine injection. All patients perceived reduction in their pain after the injection.

Reduction in pain and improvement in the functional ability of the patient was assessed after epidural steroid plus lignocaine injection. Hence, it can be regarded as one of the documented treatment options for chronic back pain, especially

among patients who are unable to undergo general anaesthesia for lumbar disc surgery (e.g. patients with very old age, ischaemic heart disease and others).

The application of epidural steroid injection permits the infusion near the site of pathology, which lowers the inflammation in the epidural area and may decrease pain within the affected nerve root. In this study steroid plus local anaesthetic agent, lignocaine was injected, to relieve back pain in all patients, and we have found better results as with the use of steroid and local anaesthetic agent, in comparison to Ghahreman et al. in his prospective randomized study, which showed that injection of steroid with local anaesthetic was superior to anaesthetic alone<sup>11</sup>.

The optimum volume of medication was required to reach the primary site of pathology to treat back pain. In this study, we have injected 10 mL of epidural steroid solution containing a mixture of 3 mL of 2% lignocaine and 1mL of 40 mg triamcinolone acetonide diluted in 6 mL normal saline,

Being hospital-based and a small number of patients were the major limitations of this retrospective study. A total of 95.3% good outcome was seen in 62 patients with lumbar interlaminar technique, in comparison to another study which has found 73% response rate in 120 patients<sup>12</sup>.

However, no significant age-related difference was seen in back pain improvement with epidural steroid plus lignocaine injection in both groups. Similar finding was also noticed in another study done by Zarghooni et al<sup>13</sup>.

No gender difference has been found in the current study to evaluate back pain with single shot of epidural steroid plus lignocaine injection with lumbar inter-laminar technique in both groups. However, we did not find evaluation of gender difference in the literature.

This study has shown benefits of both short- and long-term back pain improvement with epidural steroid plus lignocaine injection. Roberts ST et al. has also observed strong evidence for short-term relief and limited for long-term pain relief. Short-term

improvement was defined as 6 weeks or less, and long-term relief was defined as 6 weeks or longer<sup>14</sup>.

In another previous study, they have found effectiveness of back pain improvement in short- and long-term duration. Short -term period was of less than 6 months and long-term were more than 6 months<sup>15</sup>.

Current study describes that in 2 (5.4%) out of 65 patients second epidural injection was given for back pain improvement after 6 months. In comparison to former study they were injected more than two series of injection<sup>13</sup>.

Incidence of complications was recorded during and after the application of epidural steroid injection. Usually complications were seen related to technical problems during the procedure or reaction to steroid injection. No major complication was reported during the study. One (3.7%) out of 65 patients has developed a minor complication of spinal anaesthesia. In contrast study, they have identified 17 (0.06%) out of 123 patients' minor complication of back pain, pain at the injection site and others<sup>16</sup>.

Rare complication of anosmia and hiccups were reported after epidural steroid injection, which were not seen in the present study. Change in the cerebro spinal fluid volume, pressure, and flow have been documented as an explanation of anosmia<sup>17</sup>.

The novel working definition of backache with specific and non-specific pattern was established as it has already been mentioned in the internationally accepted data. Nevertheless, this study is of a short duration (18 months) compared to published literature, where a follow-up up to 24 months has been reported<sup>12</sup>. Present study has shown decreased requirement for the surgical disc removal procedure; the same is reported in the literature<sup>18</sup>.

Therefore, the study should be considered as an initial step to determine the effectiveness of single-dose epidural steroid plus lignocaine injection, which is equally beneficial in both genders. Hence, more extensive prospective studies with implication of pre-hand pro forma based on international guidelines are needed to improve the

understanding regarding the issues of backache and role of single-dose epidural injection.

## Conclusion

This study concludes that epidural injection of steroid plus lignocaine is effective and safe in relieving chronic back pain in both sexes.

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## Conflict of interest

Authors have no conflict of interests and no grant/funding from any organisation.

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