

# Outcome of Transforaminal Epidural Injections in Patients with Lumbar Radicular Pain

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## ABSTRACT

**Background:** Backache is quite a common problem in adults. One of the common reasons for this is compression on nerve roots due to disc bulge. The pain may start from back and radiate to legs.

**Objective:** The study aimed to evaluate the efficacy of corticosteroids when injected by transforaminal route.

**Study design:** This descriptive study was conducted at Orthopedic Unit 2 Mayo Hospital Lahore. The duration of the study was six months from January 2018 to June 2018.

**Material and Methods:** The study was conducted on the 127 patients attended the orthopedic department of our institute hospital. The ethical and review board committee of the hospital approved the study. Every participant was informed about the study and they willingly signed the written consent. According to the inclusion criteria the patients of age above than 18 diagnosed with the lumbar pain. The 127 patients of both genders that were included in the study were given transforaminal epidural injections (TEI). The results were studied after 4 weeks. The pain reduction was scored using Oswestry Disability Index (ODI). The age range of the patients included in the study was from 20 to 80 years. SPSS 5 was used for statistics analysis of the data collected.

**Results:** The calculated mean ODI of patients at the start was 73.90<sup>+</sup> and after four weeks it was reduced to 27.62<sup>-</sup>±8.66. The mean ODI score at baseline of the patients was 73.90±7.64 with lowest and highest value of 46 & 94 respectively. The average ODI score at 4<sup>th</sup> week of the patients was 27.62±8.66 with lowest and highest values of 10 & 60. The study results showed that the average reduction of ODI from baseline to 4<sup>th</sup> week of the patients was 46.29± 10.98 with lowest and highest reduction of 20 & 68.

**Conclusion:** This study concluded that a significant reduction in mean pain score was noted with transforaminal injections in patients with lumbar radicular pain. It can be recommended to be used in patients with lumbar radicular pain. The pain reduction was statistically significant after TEI.

**Keywords:** Transforaminal epidural injection, Oswestry score, lumbar radicular pain.

## INTRODUCTION

Backache is quite a common problem in adults. One of the common reasons for this is compression on nerve roots due to disc bulge. The pain may start from back and radiate to legs. Corticosteroids are used widely by injections as a non-surgical treatment for the condition<sup>1</sup>. For the reduction of the lumbar radicle pain this steroid injection is proved to be an effective treatment. Pain in lower back is one of the most frequent chronic pain disorders. Back pain originating in back and radiating in one or both legs is quite a common complaint in adults. This could be due to compression on nerve roots from disc bulge or degenerative changes of lumbar vertebrae<sup>2</sup>. It is known to be the main cause of disability and it is affecting the majority of the adult's population. The studies reported that it affects 15% to 20% of the working-age population annually. It also affects the adults at some point of their lives and the percentage is calculated to be 70% to 90%. It affects the men and women with same proportion<sup>1</sup>. One of the most common cause of the back and leg pain is lumbar disc prolapse. It is associated with the significant disability<sup>3-4</sup>. It was observed in literature that transforaminal route of epidural injection for management of pain of lumbar region can be more helpful in resolution of pain. But not much work was done in this regard and conservative management was still in practice. Moreover, there is very limited local evidence found in literature which could help us in implementation of this route of steroid injection. The study was conducted to confirm the beneficial role of TEI to avoid surgery and related complications<sup>5-6</sup>. This will improve our practice and we will update local guidelines in future. More over through this study, we will compare our results with international studies to see any difference statistically/ or clinically. Sciatica is another type of lumbar radicular pain caused by the foraminal stenosis and lumbar disc herniation. The nerve root inflammation is the main cause of

the pain. The conservative therapies are not proved to be effective for the treatment. The surgical treatment are considered more effective than the conservative therapies. However in the recent years the transforaminal injection is highly used for the treatment of radicular pain. For the short-term treatment of the lumbar radicular pain the lumbar transforaminal epidural injections are proven to be highly effective. These show the positive outcomes upto 6-12 months of the follow-up. It has been demonstrated that TFESI offers a clinically significant magnitude of pain reduction at short to medium follow-up times. Few variables, besides disc herniation, have been found that indicate that TFESI will relieve discomfort<sup>7-8</sup>. The epidural injection of steroid either by the caudal or interlaminar routes are proved to be more effective than the other routes. In the literature only data about the patients diagnosed with radicular pain of mixed etiology is available. There is insufficient and limited knowledge in the literature about the efficacy of the epidural injection. In order to evaluate the long-term efficacy of the epidural injection there is need to conduct a research in the homogenous population. Therefore, the rationale of this study is to assess the reduction in mean pain score with TEI in patients with lumbar radicular pain<sup>9</sup>.

## METHODS AND MATERIALS

The overall 127 patients attended the orthopedic department unite 2 of Mayo hospital were included in this research. The ethical and review board committee of the hospital approved the study. Every participant was informed about the study and they willingly signed the written consent. According to the inclusion criteria the patients of age above than 18 diagnosed with the lumbar pain. The patients who were unable to comply with the instruments like computerized tomography and magnetic resonance imaging were excluded. The patients diagnosed with foraminal stenosis were excluded from the

study. It was completed in 6months after approval of synopsis. The study design was descriptive case series. The sample size was calculated by 8% absolute precision with expected % age of pain relief group and 5% level of significance.<sup>10</sup>

$$n = \frac{z_{1-\alpha/2}^2 P(1 - P)}{d^2}$$

The sampling method was Non-probability, purposive sampling. The Exclusion Criteria was spine fracture, history of previous surgery (on medical record), infection, and recurrent pain from 3 months despite treatment (medical record). The patients on steroid therapy, allergic to trial medicine and bowel bladder involvement were also excluded. Out of the 127 patients selected from the out-patient department (OPD) hospital. Demographic profile (name, age, gender, body mass index, vertebra number and duration of pain) was also documented. After baseline pain score measured by using ODI, all patients were given Lumbar TEI of 4-mg dexamethasone and 0.33% lidocaine (3ml). After 4 weeks, pain was again measured by using ODI and reduction in pain score was calculated and the data was analyzed through version SPSS 26. Comparison of baseline and 4<sup>th</sup> week ODI score was done by applying paired sample t test. P-value <0.05 was taken as significant.

**RESULTS**

According to the study, mean ODI score at baseline of the patients was 73.90±7.64 with lowest and highest value of 46 & 94 respectively as shown in table1. The n depicts the total number of patients. The means, standard deviation, minimum and maximum oswestry disability index score in these 127 patients was calculated.

Table 1: Oswesrty disability index score at baseline

Oswesrty disability index score at baseline	
N	127
Mean	73.90
SD	7.64
Minimum	46.00
Maximum	94.00

According to this study, the average ODI score at 4<sup>th</sup> week of the patients was 27.62±8.66 with lowest and highest values of 10 & 60 respectively as show in table 2.

Table 2: Oswesrty disability index score at 4<sup>th</sup> week

Oswesrty Disability Index at 4th week	n	127
	Mean	27.62
	SD	8.66
	Minimum	10.00
	Maximum	60.00

The study results showed that the average reduction of ODI from baseline to 4<sup>th</sup> week of the patients was 46.29± 10.98 with lowest and highest reduction of 20 & 68 as shown in table 3.

Table 3: reduction Oswesrty disability index score

Oswesrty disability index reduction in pain	
N	127
Mean	46.29
SD	10.98
Minimum	20.00
Maximum	68.00

**DISCUSSION**

Disc herniation is known as the most important cause of chronic lumbar pain. Epidural steroid injections are one of the most utilized therapeutic interventions for treatment of chronic low back with or without lower extremity pain. In our research the mean ODI score

at baseline of the patients was 74.05±7.62 and the mean ODI score at 4th week of the patients was 27.38±8.61. According to this study the mean reduction of ODI score from baseline to 4th week of the patients was 46.55±11.17. Statistically significant difference found between the baseline ODI score of the patients and 4th week ODI score of the patients i. e. p – value = < 0.001. Z.A Suleiman et al<sup>11</sup> carried out an observational study in a hospital of Nigeria. The author documented that the discomfort & ODI numbers at starting point & the follow up significantly improved after six months; 44.9 ± 11.5 'vs'. 32.5 ± 11.6 (p = 0.0012) & 8.59 ± 1.29 vs. 3.7 ± 1.4 (p = 0.0023).

Epidural injections provided major pain relief and better work ability after the treatment. Choi et al<sup>12</sup> demonstrated that lumbar transforaminal injection would be successful only for a confined herniated disc. Haktan Karaman et al<sup>13</sup> conducted a study to see the complications of Transforaminal Lumbar Epidural Steroid Injections. The author concluded that only minor complications were encountered in expert hands and in the conditions in which safety precautions were taken. Lutz et al<sup>14</sup>. Showed that Fluoroscopic transforaminal ‘epidural’ injections’ become an important non operative form of treatment for radicular pain. A study conducted by the group of the scientists showed that the injection of the steroid is more effective than the transforaminal injection of the local anesthesia. These are more successful in reducing the pain score of the patients.

A study conducted by the Cecchi et al.<sup>15</sup>, showed that the poor outcomes are associated with the treatment of the chronic back pain if the higher baseline rating pain score are obtained from the statistical analysis. It is contrary to our study, but the difference can be explained because the cecchi only study the low back pain without considering the radicular pain. Boqing Chen et al<sup>16</sup> concluded that judicious use of epidural steroid injections in conjunction with a properly designed rehabilitation program may play a very important role in the conservative management of patients with severe radicular pain, improving their quality of life and function. The results of our study are comparable with previous studies. However further work should be done in this topic with larger sample size and data collection from multiple centers<sup>17</sup>. One of the limitations of our study was small sample size and study was done at single center. A study conducted at John hunter hospital showed that the 7 out of 28 showed the good long-term outcomes with transforaminal epidural injection, while only 5 showed good outcomes after intramuscular steroid injection. In another study the patients were given the injection of the transforaminal epidural steroid injection, it showed that the success rate of the transforaminal epidural injection are calculated to be 54%<sup>18</sup>.

The study conducted by the group of scientists at USA showed that the TFESI cohort showed the positive predictive value of 92% reduction in pain. A study conducted by David et al., aimed to evaluate the effectiveness of the epidural injection in the 6 months follow up. The results indicated that the more than 70% of the patients reported almost 80% reduction in pain<sup>19-20</sup>. Hence the previous studies and evidence has also showed that the transforaminal epidural steroid injection TFESI is a highly effective treatment for the immediate reduction in the radicular pain. Numerous clinical characteristics that are believed anecdotally to have the potential influence on TFESI's outcome were not evaluated in our study. Further studies are required to investigate the association of the demographic features like age, sex, employment and smoking status of the patients with the TFESI. Not only the pain scale but also the psychological and physical functions knowledge is necessary for evaluating the outcomes of TFESI<sup>21</sup>.

**CONCLUSION**

This study concluded that a significant reduction in mean pain score was noted with transforaminal Injections in patients with lumbar radical pain. It can be recommended to be used in patients with lumbar radical pain. It is an effective non-surgical treatment for

the patients diagnosed with backache. Hence from the results it can be concluded that the transforaminal epidural injection is a noteworthy tool for the non-surgical management of the lumbar radical pain with the significant reduction in pain.

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