

Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com

doi: 10.21276/jamdsr

Index Copernicus value = 82.06

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Assessment of Transforaminal and Caudal epidural steroid injections for radiating low back pain: A comparative study

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ABSTRACT

Background: The present study was undertaken for assessing and comparing the efficacy of Transforaminal and Caudal Epidural Steroid Injections Outcome for the treatment of Lumbar Radiculitis. **Materials & methods:** A total of 40 patients with history of radiating low back pain were enrolled and were broadly divided into two study groups as follows: Group A: Patients who were treated with Transforaminal epidural steroid injection, and Group B: Patients who were treated with causal epidural steroid injection. With all aseptic precautions, patients were placed in the prone position and the X ray projection was focused on the epiphyseal plate of the upper and lower vertebral body. All the patients in both the study groups were treated according to their respective study groups. Pain relief after the epidural steroid injection was assessed using Visual analogue scale (VAS) and Oswestry Disability index (ODI). All the results were summarized in Microsoft excel sheet and were analyzed by SPSS software. **Results:** While comparing the mean VAS among the patients of both the study groups, it was observed that mean VAS was significantly lower among patients of group A in comparison to patients of Group B. While comparing the mean ODI among the patients of both the study groups, it was observed that mean ODI was significantly lower among patients of group A in comparison to patients of Group B. **Conclusion:** In treating patients with chronic low back pain, Transforaminal approach exhibits superior efficacy in comparison to caudal approach and hence; should be performed with increasing frequency.

Key words: Caudal, Transforaminal, Epidural, Steroid

Received: 26 October, 2019

Revised: 21 December, 2019

Accepted: 23 December, 2019

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This article may be cited as: Gupta A, Bhat B. Assessment of Transforaminal and Caudal epidural steroid injections for radiating low back pain: A comparative study. J Adv Med Dent Scie Res 2020;8(2):87-90.

INTRODUCTION

The transforaminal approach is perhaps the most favored because the injection site is adjacent to the nerve root, and only a small volume of medication is required for injection. The caudal approach is both the easiest and the safest route and also seems to provide the most favorable analgesic effects. Hence; the present study was undertaken for assessing and comparing the efficacy of Transforaminal and Caudal Epidural Steroid Injections Outcome for the treatment of Lumbar Radiculitis.

MATERIALS & METHODS

With the aim of assessing and comparing the efficacy of Transforaminal and Caudal Epidural Steroid Injections Outcome in patients with Lumbar

Radiculitis, the present study was planned. A total of 40 patients with history of radiating low back pain were enrolled and were broadly divided into two study groups as follows:

Group A: Patients who were treated with Transforaminal epidural steroid injection, and Group B: Patients who were treated with causal epidural steroid injection

Written consent was obtained from all the patients after explaining in detail the entire research protocol. After ruling out intravascular, subdural and subarachnoid needle position prepared agent was injected containing Bupivacaine 4ml (0.5% preservative free) along with 4ml Normal saline along

with 2ml methylprednisolone (80mg) into the sacral hiatus.

Inclusion Criteria

- Age between 20 to 75 years.
- Radiating back pain with no relief after twelve weeks of conservative therapy.
- Magnetic resonance imaging (MRI) evidence of herniated nucleus pulposus at level corresponding with symptoms and clinical findings.

With all aseptic precautions, patients were placed in the prone position and the X ray projection was focused on the epiphyseal plate of the upper and lower vertebral body. All the patients in both the study groups were treated according to their respective study groups. Pain relief after the epidural steroid injection was assessed using Visual analogue scale (VAS) and Oswestry Disability index (ODI). All the results were summarized in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test and student t test was used for assessment of level of significance.

RESULTS

In the present study, a total of 40 patients with chronic low back pain were analysed. Mean age of the patients of group A and group B was 53.8 and 55.6

years respectively. There were 12 males and 8 females in group A and 14 males and 6 females in group B.

In the present study, among the subjects of group A, Mean VAS at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 6.7, 4.5, 4.1, 3.6 and 5.9 respectively. Among the subjects of group B, Mean VAS at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 7.2, 5.9, 5.1, 4.3 and 6.1 respectively. While comparing the mean VAS among the patients of both the study groups, it was observed that mean VAS was significantly lower among patients of group A in comparison to patients of Group B.

In the present study, among the subjects of group A, Mean ODI at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 55.8, 23.6, 21.8, 23.5 and 40.3 respectively. Among the subjects of group B, Mean ODI at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 59.3, 32.3, 28.4, 26.7 and 43.9 respectively. While comparing the mean ODI among the patients of both the study groups, it was observed that mean ODI was significantly lower among patients of group A in comparison to patients of Group B.

Table 1: Demographic data

Parameter		Group A (n)	Group B (n)
Age group (years)	Less than 30	5	4
	30 to 50	8	8
	More than 50	7	8
Gender	Males	12	14
	Females	8	6

Table 2: Mean VAS Score

Time interval	GROUP A		GROUP B		p- value
	Mean	SD	Mean	SD	
Pre-injection	6.7	2.3	7.2	2.8	0.77
Post- last injection	4.5	2.1	5.9	2.3	0.02 (S)
Post- last injection 15 days	4.1	1.8	5.1	1.7	0.00 (S)
Post- last injection 1 month	3.6	1.4	4.3	1.2	0.01 (S)
Post- last injection 1 year	5.9	2.2	6.1	2.5	0.69

Table 3: ODI Score

Time interval	GROUP A		GROUP B		p- value
	Mean	SD	Mean	SD	
Pre-injection	55.8	10.6	59.3	8.9	0.83
Post- last injection	23.6	5.3	32.3	4.5	0.01 (S)
Post- last injection 15 days	21.8	4.3	28.4	4.6	0.00 (S)
Post- last injection 1 months	23.5	4.2	26.7	4.5	0.01 (S)
Post- last injection 1 year	40.3	8.6	43.9	8.9	0.46

DISCUSSION

Corticosteroid injections showed early and moderate but unsustainable improvements versus placebo in certain outcomes. Corticosteroids demonstrated effectiveness in reducing pain in a substantial proportion of patients with lumbar radicular pain. The steroid injection was first used in 1953, since then it has been increasingly utilized as it was found to have local anti-inflammatory function due to inhibition of secretion of cytokines, thereby reducing pain. Therefore, corticosteroid injections were considered as an efficient and safe choice. Complications from corticosteroid injection are rare. However Surgery particularly is the main treatment modality recommended for treatment leading to decrease in pain score.⁶⁻⁹ Hence; under the light of above mentioned data the present study was undertaken for assessing and comparing the efficacy of Transforaminal and Caudal Epidural Steroid Injections Outcome for the treatment of Lumbar Radiculitis.

In the present study, a total of 40 patients with chronic low back pain were analysed. Mean age of the patients of group A and group B was 53.8 and 55.6 years respectively. There were 12 males and 8 females in group A and 14 males and 6 females in group B. Among the subjects of group A, Mean VAS at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 6.7, 4.5, 4.1, 3.6 and 5.9 respectively. Among the subjects of group B, Mean VAS at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 7.2, 5.9, 5.1, 4.3 and 6.1 respectively. While comparing the mean VAS among the patients of both the study groups, it was observed that mean VAS was significantly lower among patients of group A in comparison to patients of Group B. Jung et al. (2005) in their study of comparison of transforaminal epidural steroid injection and lumbar/caudal epidural steroid injection for the treatment of Lumbosacral Radiculopathy stated that an epidural steroid injection (ESI) is usually used for the treatment of low back pain with radiculopathy. An ESI can be performed by two procedures: I) a lumbar or caudal epidural steroid injection and II) a transforaminal epidural steroid injection. Ninety-three patients who had undergone transforaminal epidural steroid injection (Group II) and either a lumbar or caudal epidural steroid injection (Group I) were retrospectively studied. They assessed the pain, walking, standing improvement and side effects after each procedure, which were evaluated as being very good, good, fair or poor. There were no statistically significant differences in the pain, walking, standing improvement and side effects between the two groups. However, there was a statistically significant difference in the pain improvement following transforaminal epidural steroid injection in those not effectively responding to

an initial lumbar or caudal epidural block in Group II.¹⁰

In the present study, among the subjects of group A, Mean ODI at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 55.8, 23.6, 21.8, 23.5 and 40.3 respectively. Among the subjects of group B, Mean ODI at pre-injection, post-injection, post injection 15 days, post-injection 1 month and post-injection 1 year was found to be 59.3, 32.3, 28.4, 26.7 and 43.9 respectively. While comparing the mean ODI among the patients of both the study groups, it was observed that mean ODI was significantly lower among patients of group A in comparison to patients of Group B. Lee et al. (2006) conducted a study to assess the therapeutic effect of transforaminal epidural steroid for sciatica and to identify outcome predictors. Transforaminal epidural steroid injections were performed in 248 patients from June 2003 to May 2004. Fifty-six patients (33 women, 23 men; mean age, 53.3 years; age range, 30-83 years) were included. Therapeutic effects were evaluated 2 weeks after injection. The possible outcome predictors were as follows: intraepineural or extraepineural injection, saddle-type distribution pattern (contrast material distributed rostrally to the epidural portion of the preganglionic nerve root) or not saddle type, cause of sciatica (spinal stenosis vs herniated disk), patient age, patient sex, and duration of sciatica (acute or subacute [< 6 months] vs chronic [> 6 months]). Forty-three (76.8%) of the 56 patients achieved a satisfactory result 2 weeks after transforaminal epidural steroid injection. Nineteen (65.5%) of the 29 patients treated by intraepineural injection and 24 (88.9%) of the 27 patients treated by extraepineural injection achieved a satisfactory result, and this difference was significantly different ($p < 0.05$). Other possible predictors of a better outcome were identified—that is, saddle-type pattern of contrast distribution, a herniated disk, and sciatica of less than 6 months' duration. Multiple regression analysis showed that the only factor significantly associated with outcome was the type of injection ($p = 0.04$, odds ratio: 5.01). Transforaminal epidural steroid is an effective tool for managing sciatica, and an extraepineural injection may be a predictor of a better outcome for sciatica treated using transforaminal epidural steroid.¹¹

CONCLUSION

From the above results, the authors conclude that in treating patients with chronic low back pain, Transforaminal approach exhibits superior efficacy in comparison to caudal approach and hence; should be performed with increasing frequency. However; further studies are recommended.

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