Improved Functional Outcome in Patients with Lumbar Disc Prolapse Treated with Caudal Epidural Steroid Injections

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ABSTRACT

Background: Sciatica is characterised by radiating pain in an area of leg typically served by one nerve root in sacral or lumbar spine. Majority of patients have herniated disc at a single level either at L4-5 or L5-S1. Epidural steroid injection is a low risk alternative as compared to surgical intervention in patients in whom conservative treatment has failed.

Objectives: To determine the improved functional outcome in patients with lumbar disc prolapse treated with caudal epidural steroid injections.

Subjects & Methods: After informed consent, using purposive non-probability sampling, fifty patients of either sex with ageranging from 20 to 50 years with MRI proven lumbar disc prolapse and having radicular pain were included. All patients were given caudal epidural steroid injection which included (triamcinolone) 80mg and long acting anesthetic agent (bupicaine)

Results: Most of the patients were found with the age between 41-50 years i.e. 56%(n=28) mean and standard deviation was recorded as 38.64+7.99, male dominancy was observed in the study as 78%(n=39) were found as male. at final follow up i.e. 12th week, 4%(n=2) patients were found with poor results, 28%(n=14) had fair, 48%(n=24) had good and 20%(n=10) had excellent results.

Conclusion: Improved functional outcome in patients with lumbar disc prolapse treated with caudal epidural steroid injections was found in the study.

Key words: *Disc prolapse, caudal epidural steroid injections, improved functional outcome*

INTRODUCTION

The most common reasons for low back pain are radiculopathy, disc herniation and spinal stenosis1 amongst which prolapsed disc is the major cause of morbidity due to low back pain[3]. According to one study lumbar radiculopathy in patients younger than 40 years of age is herniated nucleus pulposus. The nucleus pulposus may bulge into the canal. Nerve root compression may cause secondary inflammation of the nerve root, giving the patients subjective symptoms of pain.[2] Detailed history, physical examination supplemented by neuroimaging can differentiate herniated disc prolapse from other causes of LBP and sciatica. Lasegue sign or straight leg raising test, described by frost in 1881 was devised to distinguish hip disease from sciatica.[4] Sciatica is characterized by radiating pain in an area of leg typically served by one nerve root in sacral or lumbar spine. The estimated annual incidence of sciatica in western countries is 5 cases per 1000 adults[5].

Majority of patients (90.6%) have herniated disc at a single level either at L4-5 or L5-S1Males suffer more than females in a ratio of 2.6:1[3]. LBP treatment varies from conservative to operative modalities with varied results. Conservative treatment includes rest, analgesics, traction and sometimes spinal manipulation. Those not responding may require surgical intervention. The international consensus has been that surgery should be offered only if symptoms persist after a period of conservative treatment[5].

Epidural steroid injection is a low risk alternative to surgical intervention in patients in whom conservative treatment has failed. It has been advocated because it modulates the body's response to inflammatory stimuli[6] and has been used with gratifying results. They are a combination of long acting steroids and epidural anesthetic.[7]

The rationale of this study was to establish that caudal epidural steroid injection is cost effective, minimally invasive, avoids surgical intervention and provides early relief of symptoms in patients with radicular pain associated with lumbar disc prolapse. If

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more patients show good functional outcome in this study, it would be emphasized that this intervention should be considered before surgical options in patients who fail conservative treatment.

OBJECTIVE OF THE STUDY

The objective of the study was:

- To determine the improved functional outcome in patients with lumbar disc prolapse treated with caudal epidural steroid injections.

MATERIAL & METHODS

SETTINGS:

- Department of Orthopaedic Surgery Unit 1, Jinnah Hospital Lahore

DURATION OF STUDY:

- 6 months

SAMPLE SIZE:

- 50 cases

Inclusion Criteria

- Patients with either sex having clinically significant back pain radiating to lower limb (sciatica).
- MRI proven disc
- Ages between 20-50 years
- Straight leg raise(SLR) < 60 degrees
- Single level disc (L 3- S1)

Exclusion Criteria

- Cauda equina syndrome (loss of bowel and bladder control with neurological deficit)
- Rapidly progressive neurological deficit (sensory loss, motor weakness in involved nerve root)
- Presence of infection (lymphocyes >11,000mm^3 , ESR>30mmHr,)
- Known case of bleeding disorder (PT>19, APTT>38)
- Hypertensive patient and known case of Ischemic heart disease (ECG, B.P Recording)

STUDY DESIGN:

- Descriptive case series

DATA COLLECTION PROCEDURE:

- All patients fulfilling the inclusion criteria were included in study through outpatient department after taking informed consent. In all cases fit for intervention was performed by a single consultant surgeon. In all patients a caudal epidural injection was given consisting of 80 mg of steroid (triamcinalone) and long acting anesthetic agent (bupicaine). Follow up of the patients was performed initially at 2 weeks and then at 4 weekly intervals up to 12 weeks in the outdoor by researcher himself. Patients in fair and poor grade of Macnab's criteria at 2 weeks, follow up was given a second injection. The assessment ofthe patient was carried out using the Macnab's criteria at each follow up in terms of Excellent, Good i.e. improved functional outcome. All the data was entered on the respective Performa for each patient.

DATA ANALYSIS:

- All the data was entered on Performa and then was analyzed in SPSS version 12 on a computer. Qualitative variables like gender and improved functional outcome (Excellent or Good) was presented as descriptive statistics, calculating their frequencies and percentages. Quantitative variables like age were presented as numerical statistics, calculating its mean and standarddeviation.

RESULTS

Total 50 patients were included in the study to determine the improved functional outcome in patients with lumbar disc prolapse treated with caudal epidural steroid injections.

AGE DISTRIBUTION:

Age distribution of the patients reveal that most of the patients were found with the age between 41-50 years i.e. 56%(n=28), while 28%(n=14) were found between 31-40 years and only 16%(n=8) were found between 2-30 years of age, and mean and standard deviation was recorded as 38.64+7.99. (Table No. 1)

GENDER DISTRIBUTION:

Gender distribution is presented in Table No. 2, where male dominancy was observed in our study as 78 %(n=39) were found as male and rest of 22%(n=11) were female.

FUNCTIONAL OUTCOME ACCORDING TO MACNAB'S CRITERIA AFTER CAUDAL EPIDURAL INJECTION

In Table No. 3 we calculated functional outcome according to Macnab's criteria at 2^{nd} week of intervention 40 %(n=20%) patients had poor outcome, 48%(n=24) had fair and 12%(n=6) had good outcome while no patient was recorded with excellent results. At 4^{th} week of intervention, 14 %a(n=7), 32%(n=16) had

fair, 40%(n=20) had good results while 14%(n=7) had excellent results.

Table No. 1: Age Distribution (n=50)

Age (in years)	No. of patients	%
20-30	08	16
31-40	14	28
41-50	28	56
Total	**50**	**100**
Mean and s.d. 38.64+7.99		

At 8th week, 6%(n=3) had poor, 30%(n=15) had fair, 46%(n=23) had good and 18%(n=9) had excellent results while at final follow up i.e. 12th week, we found 4%(n=2) patients with poor results, 28%(n=14) had fair, 48%(n=24) had good and 20%(n=10) had excellent results.

Table No. 2: Gender Distribution (n=50)

Gender	No. of patients	%
Male	39	78
Female	11	22
Total	**50**	**100**

Table No. 3: Functional outcome according to Macnab's criteria after caudal epidural injection

	2 wk	4wk	8wk	12wk
Excellent	--	07(14%)	09(18%)	10(20%)
Good	06(12%)	20(40%)	23(46%)	24(48%)
Fair	24(48%)	16(32%)	15(30%)	14(28%)
Poor	20(40%)	07%(14)	03(6%)	02(4%)
Total	50(100%)	50(100%)	50(100%)	50(100%)

DISCUSSION

Chronic back pain and its associated disabilities represent an important health problem.[8] The rising prevalence of obesity may increase the impact of chronic back pain. The competitive nature of the modern workplace places individuals with less than perfect health and, in particular, those with painful conditions at a disadvantage.

Reports of epidural corticosteroid injections to treat sciatica date back to the 1950s.[9,10] Their use has increased over time despite limited quality data, as reflected by conflicting reviews of their efficacy and safety.[11-13] These reviews varied in terms of criteria for inclusion of patients, study design, types of interventions, outcome measures, and use of additional treatments.

A review (2004) by the Technology Assessment Committee of the Institute of Clinical Systems Improvement (ICSI)[14] focused on fluoroscopically guided, transforaminal epidural steroid injections in radicular lumbar pain. Although it used an evidence-based approach, the rating system was different from that of the American Academy of Neurology (AAN). It concluded that, even though results based on limited data appeared to be promising, there was insufficient evidence to comment on the efficacy of transforaminal epidural steroid injections in radicular lumbar pain.[14]

We conducted this study considering the fact that caudal epidural steroid injection is cost effective, minimally invasive, avoids surgical intervention and provides early relief of symptoms in patients with radicular pain associated with lumbar disc prolapse. Epidural steroid injection is a low risk alternative to surgical intervention in the treatment of lumbar disc herniation and having excellent functional outcome.

The current study reveals at final follow up i.e. 12th week, 4 %(n=2) patients with poor results, 28 %(n=14) had fair, 48 %(n=24) had good and 20%(n=10) had excellent results.

We found these results in agreement with a study conducted by Javaed S and Colleagues[3] who found (20%) patients in excellent category, 20 (40%) in good, 20 (40%) in fair and no patient in poor.

Runu et al[15]evaluated that at the end of 3 months, good results were seen in 39%, fair in 33% and considered Epidural Steroid Injection as a safe and effective mode of treatment of Low Back Pain. It provides pain free period to enable the patient for physiotherapy, which helps in early recovery. Banaszkiewicz et al[16] evaluated 41% of patients either

an excellent/good response to caudal epidural injection while 34% were no better or worse.

The limitation of this study was that we did not included any side effects of caudal epidural injection but the reported complications of epidural steroid injections are usually minor and transient: the most frequent is a transient headache. Reported major complications are rare (aseptic meningitis, arachnoiditis, bacterial meningitis, epidural abscess, and conus medullaris syndrome), and may result from subarachnoid, rather than epidural injection. There may be underreporting of complications, and the reported safety track record of experienced practitioners with large volumes may not reflect the track record of smaller volume or less experienced practitioners.[17]

More patients showed good functional outcome in this study, it would be emphasized that this intervention should be considered before surgical options in patients who fail conservative treatment.

CONCLUSION

- Improved functional outcome in patients with lumbar disc prolapse treated with caudal epidural steroid injections was found in the study and it would be emphasized that this intervention may be considered before surgical options in patients who fail conservative treatment of lumbar disc prolapse.

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