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Caudal Epidural Injection of Steroid and Local Anesthetic in the Management of Chronic Low-Back Pain

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Abstract

Objectives: The present study was carried out to assess the role of caudal epidural injections of steroid with local anesthtic in the management of chronic low-back pain. *Materials and Methods:* Fifty patients of chronic low-back pain were included in the study. Epidural injections of steroid with local anesthetic were administered to them via caudal approach. Follow up was scheduled after 1 month, 3 months, and 6 months. Assessment was done by using VAS score and ODI. *Results:* Fifty patients of chronic low-back pain were included in the study. 31 (62%) patients were male and 19 (38%) were female. Age of the patients ranges from 30 to 70 years with the mean age of 55.21 years. Mean VAS score of the patients before the intervention was 7.91 ± 1.60 which was reduced to 3.87 ± 1.21 at 1 month follow-up, 3.46 ± 1.32 at 3 months follow-up and 4.66 ± 1.56 at 6 months follow-up. Similarly, mean ODI of the patients before the treatment was 53.81 ± 6.12 which was reduced to 33.67 ± 4.89 at the end of 1 month, 32.65 ± 5.11 at the end of 3 month and 28.80 ± 4.71 at the end of 6 month. *Conclusion:* Caudal epidural injection of steroid with local anesthetic is an effective method for the management of chronic low-back pain in terms of pain relief and functional improvement in both short- and long-term results.

Keywords: Chronic low back pain; Steroid; Local anesthetic; Epidural; Radiculopathy; Spinal stenosis.

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Introduction

Chronic low-back pain is a common community health problem worldwide. Over 70% people in developed countries experience low-back pain at sometime in their lives.[1] In India, this figure is even more around 80%. Every year, around 3–4% of population in India is temporarily disabled, and 1% of working age population is disabled totally and permanently because of low-back pain.[2]

Low-back pain is defined as pain, muscle tension or stiffness localized below the costal margin and above the inferior gluteal folds with or without leg pain and it is defined as chronic when the duration of pain is 12 weeks or more.[3]

The origin of low-back pain can be various anatomic structures like muscles, fascial structures, nerve roots, bones, joints, intervertebral discs, and abdominal organs. Many times, the pain can arise from aberrant neurological pain processing which causes neuropathic low-back pain.[4,5]

Furthermore, low-back pain can also be influenced by psychological factors (like anxiety, depression and stress, etc.) and psychosocial factors.[6–8]

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Hence, the diagnosis of low-back pain is very challenging and must include thorough history taking about the symptoms as well as about psychological and psychosocial factors. A proper clinical examination and identification of origin of pain is the mainstay of diagnosis. Radiological investigations including MRI/CT scan should be advised wherever necessary.

Till now, various conservative, surgical and non surgical methods have been used for low-back pain with variable results.[9-13] Every patient with low-back pain is not a candidate for surgery and, in fact, surgery had been proven failure in approximately 25% of well selected cases.[14]

A cornerstone of non-surgical treatment for low-back pain is epidural steroid injection and still is the most commonly performed procedure for low-back pain.[10–13]

There are three different ways to perform epidural injection, viz. caudal block, translumbar approach and transforamial approach. In present study, we are using caudal epidural injection (CEI) approach to administer steroid and local anesthetic (LA) agent for the management of low-back pain.

Materials and Methods

The present study is a prospective study carried out in the department of anesthesia, Ananta institute of medical sciences, Rajsamand during the period of 1 year from January 2018 to January 2019. Fifty patients attended orthopedic OPD with the complaints of low-back pain were included in the study.

Sample size and sampling: Fifty patients of chronic low back pain.

Study type: Quantitative, Prospective

Duration of study: 1 year

Inclusion criteria

1. Pain on the low-back region, buttock and/or lower extremities while standing, walking and/or spinal extension.
2. Mild-severe lumbar central canal spinal stenosis identified by CT/MRI.
3. Lower extremity symptoms consistent with neurogenic claudication.
4. Must provide consent for study and should be able to complete the assessment instruments.
5. Age ≥ 30 years.

Exclusion criteria

1. Other comorbidities that could interfere with the results of the study concerning pain and function like painful peripheral neuropathy, fibromyalgia, Parkinson disease, dementia, stroke, amputees, other neurological disorders
2. Spinal instability requiring surgical fusion.
3. Severe osteoporosis
4. Known hip joint pathology
5. Bone metastasis
6. Allergy to local anesthetic and/or steroid.
7. Tuberculosis or other bone infection
8. Any other systemic disorder that limits ambulation of patient

Technique

The procedure was carried out in the operation theater. The patients were laid in prone position with a pillow in their inguinal region. Sacral hiatus was palpated and a 22G spinal needle was preceded into the hiatus at an angle of 45. Reaching the bone structures, the angle reduced to 10 and after preceding about 5 cm, hiatus was entered and epidural region was attained. Injection containing 2 ml (80 mg) methyl prednisolone with 4 ml of 2% xylocaine was injected into the epidural space without fluoroscopic guidance.

Data collection tool (score) used: Pain was assessed by using visual analogue scale (VAS) score (1–10). Functional status was assessed by using Oswestry disability index 2.0 (ODI).[15]

Follow-up: Follow up was scheduled at 1, 3 and 6 months.

Ethical clearance was taken from institutional ethical committee. Informed written consent was obtained from all the patients involved in the study.

Results

Fifty patients of chronic low back pain who met the inclusion criteria were included in the study. 31 (62%) patients were male and 19 (38%) were female. Age of the patients ranges from 30 to 70 years with the mean age of 55.21 years.

Mean VAS score of the patients before the

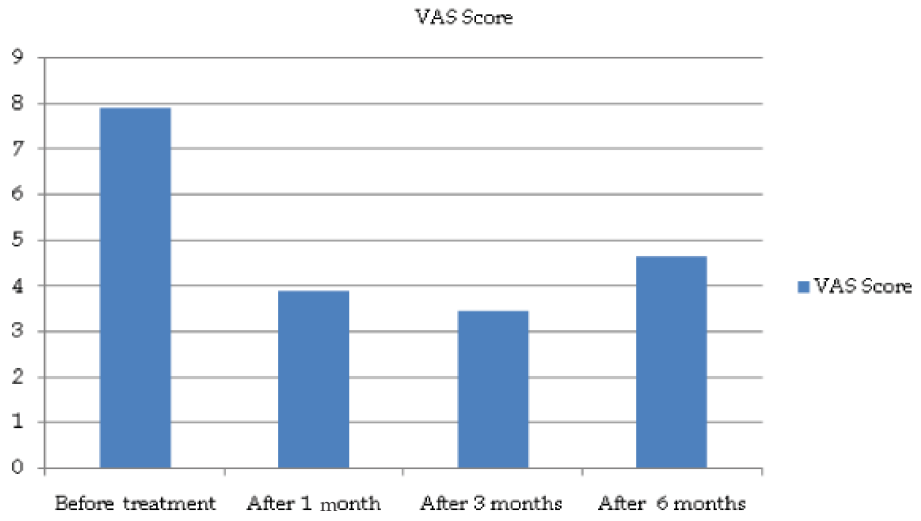

Fig. 1: MeanVAS score of the patients before treatment and at 1, 3, 6 month follow up.

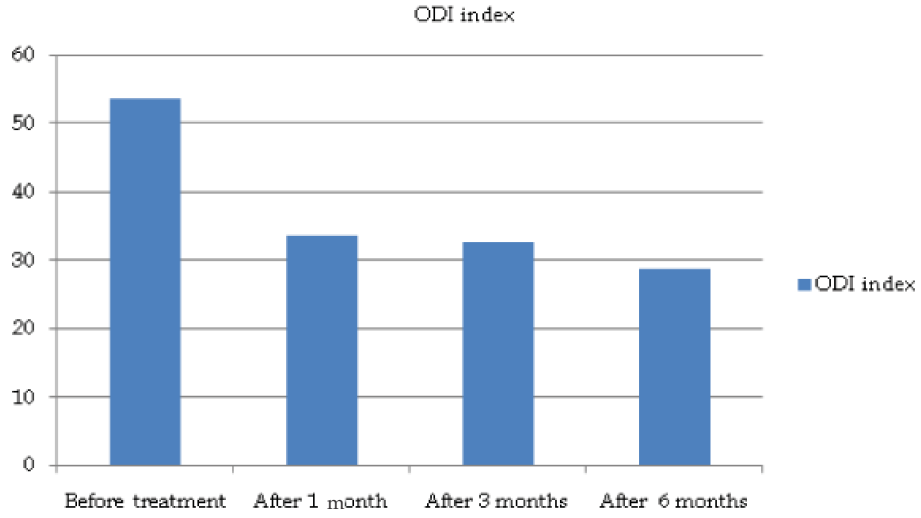

Fig. 2: Mean ODI before treatment and at 1, 3, 6 month follow up.

intervention was 7.91 ± 1.60 which was reduced to 3.87 ± 1.21 at 1 month follow-up, 3.46 ± 1.32 at 3 months follow-up and 4.66 ± 1.56 at 6 months follow-up. When compared to the VAS score before the treatment, the results were statistically significant (p-value < 0.05). Mean VAS score at six months follow up was higher than previous follow up values but the difference was not found to be statistically significant (p-value > 0.05) (Fig. 1).

In present study, mean ODI of the patients before the treatment was 53.81 ± 6.12 which was reduced to 33.67 ± 4.89 at the end of 1 month, 32.65 ± 5.11 at the end of 3 month and 28.80 ± 4.71 at the end of 6 month. When ODI values at each follow up was compared with ODI before treatment, the difference was statistically significant (p-value < 0.05) but when the ODI values at each follow up were compared with each other, the difference were not significant (p-value > 0.05) (Fig. 2).

Discussion

The present study was carried out to assess the role of caudal epidural injections of steroid with local anesthtic in the management of chronic low-back pain. The study showed positive outcome in both short- and long-term results in terms of reduction

in pain as well as good functional outcome.

The improvement in pain after epidural injections was assessed using VAS score. The mean VAS score of the patients before the intervention was 7.91 ± 1.60 which was reduced to 3.87 ± 1.21 at 1 month follow-up, 3.46 ± 1.32 at 3 months follow-up and 4.66 ± 1.56 at 6 months follow up. When compared with initial VAS score, the difference at follow up was statistically significant (p-value < 0.05), suggestive of positive outcome in both short- and long-term period. The VAS score at 6 months follow up was little higher than the previous follow up but the difference was not statistically significant (p-value > 0.05).

The improvement in mobility and function was assessed using ODI (Oswestry Disability Index).

ODI is calculated based on each score of the ODQ (Oswestry Disability Questionnaire), which consists of ten items. Each of the ten items is scored from 0 to 5, and the total is added and multiplies by 2. Therefore, the ODI ranges from 0 to 100.[15]

In present study, mean ODI of the patients before the treatment was 53.81 ± 6.12 which was reduced to 33.67 ± 4.89 at the end of 1 month, 32.65 ± 5.11 at the end of 3 month and 28.80 ± 4.71 at the end of 6 month. The difference was found to be statistically significant when ODI at each follow up was compared with ODI before treatment (p-value <0.05). The results are suggestive of good positive outcome in both short- and long-term follow up.

Manchikanti *et al.* performed a similar study in 2010 which included 70 patients of discogenic low-back pain. They compare the effect of caudal epidural injections (CEIs) of steroid and LA with CEIs of LA alone. Results were assessed using VAS, ODI, employment status and opioid intake. They got positive outcome for both short- and long-term results in both the groups. (86% in steroid + LA group and 74% in LA alone group). The results suggested that CEIs of steroid with LA are more effective than CEIs of LA alone in treatment of discogenic low-back pain.[16]

Ghahreman *et al.* also performed a comparative study in 2010 with 150 patients of low-back pain radiating to lower limb and concluded that CEIs of steroid with LA were effective than intramuscular injections in pain reduction secondary to radiculopathy.[17]

Wilson-Macdonald *et al.* performed a study in 92 patients of disc prolapse or spinal stenosis. They compared the effect of CEIs of steroid and LA with that of intramuscular injection of the same in the management of chronic low-back pain due to disc prolapsed or spinal stenosis. The assessment methods used were Oxford pain chart and ODI. They concluded that CEIs of steroid with LA was more effective in short-term results but was not found beneficial over intramuscular injections in long-term results.[18]

Iversen *et al.* also performed a study in 2011 to compare the effect of CEIs of steroid with that of placebo. 133 patients with unilateral lumbar radiculopathy were included in their study. The results were in contrary to our findings. They concluded that CEIs of steroid had no benefit over placebo in treating lumbar radiculopathy.[19]

Arden *et al.*, in 2005, studied the effect of CEIs of steroid with LA in 228 patients of sciatica and concluded that CEIs of steroid with LA had only short-term benefit over placebo in treating sciatica. Thus the results were partially in favor of present study.[20]

Bush K and Hillier S performed a placebo controlled study to assess the effect of CEIs of steroid with LA in the management of intractable sciatica and found that after 1 year follow up; subjective and objective measures were improved in both the groups. The improvement was greater in actively treated group but only the objective assessment, i.e. straight leg raise, was statistically significant.[21]

Another study done was by Breivik H *et al.* in the year 1976. Thirty-five patients of chronic lumbar radiculopathy were included in the study and a comparative assessment was done between the effect of CEIs of bupivacaine and methylprednisolone with bupivacaine followed by saline. They found improvement in both the groups but the improvement was greater in treatment group.[22]

In present study, caudal epidural injections of steroid with local anesthetic were found to be highly effective in both short- and long-term follow up. Both the VAS and ODI were improved till the 6 months follow up. ODI was slightly reduced at 6 months follow up than the previous value but the difference was not statistically significant.

An important limitation of present study was that we did not extend our treatment to control items for the comparison due to limitations of the time course. Replication of treatment results with the use of other control items would have provided a strong demonstration of experimental control,

strengthening the results of the study.

Conclusion

The results of the present study showed that caudal epidural injections of steroid with local anesthetic is an effective method for the management of chronic low-back pain in terms of pain relief and functional improvement. The results of present study are in favor of many studies done in the past but in contrary to some other studies. An important limitation of present study was that control items were not included in the treatment strategy. In future, controlled studies with large sample group and systematic reviews of various such studies are expected for further useful outcomes in the management of chronic low-back pain.

What this study adds to existing knowledge

The present study advocates the use of epidural steroid with local anesthetic injections for the management of chronic low-back pain. In comparison to previous study of using steroid alone or LA alone, the combination of steroid and LA have better results in both short- and long term follow up. Further, many patients in developing countries live with disability to avoid surgery but CEIs can be an effective alternative for them.

Conflict of interest: No conflict of interest exists. No financial relationship exists between authors and products or procedures related to the article.

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