

Original Article**Caudal Epidural Steroid Injection under Fluoroscopy in Management of Chronic Low Back Pain with or without Radiculopathy**

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Article Received: 16th October, 2019; Accepted: 25th January, 2020; Published: 30th June, 2020DOI: <http://dx.doi.org/10.3126/jonmc.v9i1.29382>**Abstract****Background**

Low back pain with or without radiculopathy is most common presentations of chronic pain. Caudal epidural steroid injection is one of the treatment modalities of this type of pain syndromes.

Materials and Methods

The study was conducted in 100 patient who presented in our pain clinic. These patients were given caudal epidural steroid injections under fluoroscopy guidance with 60 mg depo-methylprednisolone added to 0.5% lignocaine making a volume of 10 ml. All these patients were asked to follow up at pain clinic at 1 month, 3 months & 6 months to assess the visual analogue scale (VAS) score, Oswestry disability index (ODI), Straight leg Raise test (SLRT) & Patient satisfaction scale.


Results

There was significant reduction in VAS score in one month, three months and six months follow up after caudal epidural steroid injection. The 50% reduction in pain was seen in 72 patients, 69 patients and 62 patients in one month, three months and six months respectively. The mean VAS score were 7.84 before pre-injection, 4.32 at one hour, 4.06 at one month, 4.18 at 3 months and 4.64 at 6 months after the procedure. The mean ODI were 35.16 before pre-injection, 32.12 at one hour, 28.14 at one month, 28.57 at 3 months and 28.68 at 6 months after the procedure.

Conclusion

Caudal epidural steroid injections causes significant relief in pain symptoms of backache with or without radiculopathy and increases the quality of life.

Keywords: *Chronic Pain, Low back pain, Pain Clinics*

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Introduction

Low back Pain is one of the most common complaints that a patient presents with at pain clinic. It has also been reported that it is an important clinical, social, economical, and public health problem affecting the human population world- wide [1]. Each year about 3-4 % of the people gets temporarily disabled and about 1% of the population is disabled totally and permanently due to low back pain [2]. It is chronic when pathological and/or anatomical instability persist beyond three months.

The common causes of low back pains with or without radiculopathy includes degenerative disc diseases, prolapse intervertebral disc and spondylolisthesis, lumbar spinal stenosis, facet joint and sacro-iliac joint arthropathy. In view of management of low back pain includes short term analgesics, physiotherapy and patient education and counseling. The introduction to the use of epidural steroids has been accepted in low back pain with or without signs of nerve root irritation [3]. Epidural steroid injection provides a good symptomatic relief in patients with chronic low back pain with or without radiculopathy. Epidural steroid injections injected in the epidural space attains higher local concentrations over the inflamed nerve root and thus effective than its other routes like oral, intravenous or intramuscular. Epidural steroid injections can be given by three main routes viz. Trans-foraminal, caudal and laminar approach and in our study we have studied via caudal approach since it is the most commonly practiced in our setup and accounts to be cost effective.

The main aim of our study was to find out the outcomes of caudal epidural steroid injections in chronic low back pain with or without radiculopathy of different pain origins and to judge the short term and medium term therapeutic efficacy with the help of Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI), Straight leg Raising (SLRT) and Patient's Satisfaction scale. Oswestry Disability Index (ODI) is considered as a gold standard for measuring the disability and quality of life and therefore this study also helps to know the improvement in quality of life of the patients. In context of our country there are several studies done by various authors regarding caudal epidural steroid injections for chronic low back pain but none of the author has done under C-ARM guidance till date.

Materials and Methods

This prospective and observational study was done after obtaining institutional ethical committee approval, conducted by Department of Anesthesiology, Critical Care and Pain Management at

Nobel Medical College Teaching Hospital. A convenient sample of 100 patients was selected from those attending to our pain clinic from August 2018 to July 2019 which has been referred by multidisciplinary clinics of our institutions. The inclusion criteria includes low back pain with or without radiculopathy, failed analgesics and non pharmacological therapy trial of at least three months or more, duration of pain for at least more than three months, patients who have already done magnetic resonance imaging (MRI), both sexes. Progressive neurological deficits, uncontrolled diabetes and hypertension, patients unwilling for procedure were excluded from our study.

Sample size was determined based on a similar study conducted by Jati S et al in Indore, india [4]. Thus the sample size was calculated using the prevalence of low back pain 80% and 7.5% difference, where sample size $n = Z^2 PQ/d^2$ $[(1.96^2 \times 80 \times 16/7.5^2) = 87]$. Therefore, 100 patients included in the study as a convenient sampling. Statistical data was done using software SPSS version 10.0. Descriptive statistics was used to calculate mean and standard deviation of age, sex, occupation and weight of patients, duration of low back pain and injections effectiveness. Categorical data were calculated as frequencies and percentages.

Procedure Technique

After patients consent taken for procedure, routine investigations such as hemoglobin, total leucocyte count, differential leucocyte count, platelets count, blood sugar, blood urea, serum creatinine, bleeding time and coagulation time was done. All detailed history including comorbidities, duration of low back pain, previous medication used was recorded. The severity of back pain was assessed by using Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) criteria and Straight leg Raise test (SLRT) before the procedure. Those patients who had VAS score less than 50% and more than 50 % disability reduction after injection were considered as good responders to the injections. All patients on arrival to operation theatre were attached with routine monitors like noninvasive blood pressure, electrocardiogram and pulse oximetry. Intravenous access was done with 20 gauge cannula and ringer lactate was started slowly.

Once everything is ready, patient are placed in prone position and antiseptic dressing and draping done with sterile techniques. Marking the midline of sacral hiatus is done by taking AP image with x-ray tube below the table. Now C-



ARM is turned to lateral view and sacral hiatus is identified. Entry of needle was marked few centimeters below sacral hiatus so as the needle hits the inferior part of sacral hiatus at an angle of 30-45 degree. Infiltration of needle entry was done with 1% lignocaine. Spinal needle of 20G inserted by hitting the posterior surface of S5 vertebral body just below sacral hiatus and then insertion angle is decreased so as to slip into sacrococcygeal membrane. It is inserted further for 2 cm in sacral canal. Now C-ARM is moved to AP and needle is advanced till S3 vertebra. After negative aspiration 2 ml of contrast (Iohexol) is injected which forms inverted Christmas tree appearance. After ruling out intravascular, subdural and subarachnoid needle position 10 ml of 0.5% lignocaine mixed with 60mg depo-methylprednisolone was injected. Dilution of contrast after drug injection was confirmed under fluoroscopy.

Patients were observed and hemodynamic monitoring was done for two hours in post procedure room before being discharged from hospital. Patient's Visual Analogue Scale (VAS), Oswestry Disability Index (ODI), Straight Leg Raise test before procedure and one hour after the procedure was recorded. All the patients were followed up at pain clinic after one month, three months and six months following procedure and Visual Analogue Scale (VAS), Oswestry Disability Index (ODI), Straight Leg Raise Test (SLRT) and Patient satisfaction scale were recorded. The patient who could not come on follow up on given time was asked on telephone regarding their VAS score & Oswestry Disability Index (ODI) and Patient satisfaction scale and Straight Raise leg test (SLRT).

Table 1: Scales included in patient questionnaire [5]

Oswestry Disability Index (ODI)	Percentage
Minimally disabled	0-20%
Moderately disabled	20-40%
Severally disabled	40-60%
Crippled	60-80%
Bed bound or exaggerating	80-100%

Table 2: Patient satisfaction scale

Completely better
Somewhat better
Worse

Results

In our study, we recruited 102 patients where as two patients were excluded from the study because they didn't gave the consent for the procedure. So the final analysis includes 100 patients and following analysis was made.

Table 3: Demographic Data

Parameters	Results
Age (years) (Mean±SD)	42.45±11.030
Gender (%)	Male 68 Female 32
Body weight (Kg)	54.7±7.313
ASA physical status (%)	ASA I 32 ASA II 48 ASA III 20 ASA IV 00
Duration of Pain (Months) Mean±SD	3.8±2.93

The clinical and MRI findings among these 100 patients showed 55 patients had herniated disc with or without radiculopathy, 29 patients had spondylolisthesis, 11 patients had spinal canal stenosis and five patients had failed back surgery syndrome.

Table 4: Shows the Visual Analogue Scale (VAS) score before the caudal epidural steroid injection.

VAS	5	6	7	8	9	10
Number of Patients	0	7	10	69	14	0

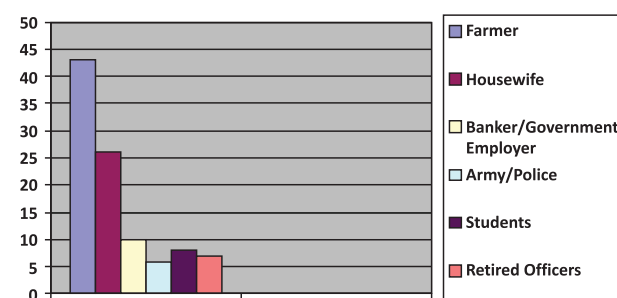


Figure 1: Occupation Distribution

Table 5: History of previous treatment

Previous Treatment	Percentage
Rest/ Analgesics	96%
Lumbosacral belts	72%
Physiotherapy	78%
Epidural Injections	00%

Among the patients 42 patients had 50-70% pain relieved, 40 patients had 70-80% pain relieved, 16 patients had 80-90% pain relieved and two patients had 90-100% pain relieved one hour after the caudal epidural steroid injections.

Table 6: Mean Outcome Measures

Outcome measure	Pre-injection Mean	1 hour after injection Mean	One month Mean	3 months Mean	6 months after injection Mean
VAS (±SD)	7.84(±1.2)	4.32(±1.4)	4.06(±1.6)	4.18(±1.4)	4.64(±1.2)
SLRT(degrees)	40.24	52.24	58.62	66.38	64.32
ODI	35.16	32.12	28.14	28.57	28.68

Among the patients followed up after one month, 72 patients had pain relieved greater than 50%. In



the patients followed up after three months, 69 patients had pain relieved greater than 50 % whereas 62 patients had pain relieved after six months of follow up.

There was reduction of more than 50% disability reduction i.e. Oswestry Disability Index (ODI) score in one month, three months and six months and thus improvement in functional status of life.

The patient satisfaction scale showed 72% of patients felt completely better or somewhat better at one month, 66% of patients felt completely or somewhat better at 3 months and 56% of patients felt completely or somewhat better at 6 months after injections. There were no any major complications noted during or after the procedure.

Discussion

Since ancient days regional anesthetic techniques have been used in Egypt and it also has been mentioned in the Erb's Papyrus. These were given up later till the beginning of 20th century. But, since mid-70's there was dramatic changes in the use of regional anesthesia for the treatment of pain management most commonly in chronic pain. Therefore, today a well conducted regional anesthesia technique is such a beauty and provides satisfaction and comfort to the patients, anesthesiologists and surgeons. This is why today even the patients and surgeons request for regional anesthesia for their surgeries. It is advised by the international Association for the study of Pain (IASP), that pain should be diagnosed earlier and treated as a human right and therefore the chronic pain should be considered a disease as a whole and should be treated as special speciality [6]. The present clinical rationale for steroid usage in caudal epidurals is primarily based on the benefits, which includes pain relief outlasting by hours, days, weeks and months according to its pharmacological actions and local anesthetics [7]. Lower back pain with radicular symptoms that correlate clinically with examination and imaging is an efficacious target for epidural steroid injection in short term pain management [8], [9]. In our study it is seen that the back pain with or without radiculopathy can be caused by the herniated disc with or without radiculopathy, spinal canal stenosis, spondylolisthesis, failed back surgery syndrome and similar has been advocated by Das G et al [10].

Several studies has concluded that because of inaccuracy of blind technique, it has been recommended caudal epidural under fluoroscopy guidance [11], [12]. In view of this, our study was also performed on C-ARM guidance and found

that this technique was easier, beneficial, accurate and increases the success rate of caudal epidural block. In our study the initial improvement in pain relief one hour after injection was due to the action of local anesthetics which was also described by the study done by Guha R et al [13]. In our one month, three months and six months follow up study, most numbers of patients had significant relieved in VAS score. It has been found that 72 patients in 1st month, 69 patients in 3rd month and 62 patients in 6th month had more than 50 % of pain relieve following caudal epidural steroid injections and was similar to the study done by Sayegh FE et al, Rho ME et al [14], [15]. The mean visual analogue scale score was 7.84 before injection, 4.32 one hour after injection, 4.06 one month after injection, 4.18 three months after injection, 4.64 six month after injection and Rosenberg et al did a retrospective study on 82 patients and reported the decrease of mean VAS score from 7.8 to 5.8 at 6 months and 5.1 at 12 months [16].

The mean Oswestry Disability Index (ODI) scale were 35.16 pre-injection, 32.12 one hour after injection, 28.14 one month after injection, 28.57 three months after injection and 28.68 six months after injection which was similar to the study done by Botwin K et al though his study was done only on degenerative lumbar stenosis patients [17]. The mean Straight Leg Raising test (SLRT) was 40.24 degree and increased up to 66.38 degree at 3 months after injection and 64.32 degree at six months after injection. Similar findings was seen by Sayegh FE et al with 88% negative SLRT during 6 months after injections [14]. Similarly, Bansal V et al also had similar findings with 62.9 degree at six months after the procedure [18].

Conclusion

Caudal epidural steroid injection under fluoroscopy guidance helps in significant reduction in VAS score, ODI score and SLRT in patients with low back pain with or without radiculopathy. As we did not repeat the caudal epidural steroid injections during our six months follow up periods, there are studies were repetitions of injections have found to be beneficial in reducing the pain scores further.

Conflicts of interests: None

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