CLINICAL EVALUATION OF CAUDAL EPIDURAL STEROID INJECTIONS IN MANAGING LUMBAR DISC PROLAPSEDhrubajyoti Borgohain¹, Mituban Gogoi²**HOW TO CITE THIS ARTICLE:**

Dhrubajyoti Borgohain, Mituban Gogoi. "Clinical Evaluation of Caudal Epidural Steroid Injections in Managing Lumbar Disc Prolapse". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 74, September 14; Page: 12803-12808, DOI: 10.14260/jemds/2015/1845

ABSTRACT: Lumbar disc prolapse as a cause of back and leg pain is quite a common presentation at a pain clinic which results in significant disability & overall loss of productive work. This study is an uncontrolled, prospective study that included 25 patients (15 males and 10 females) during the period 2013–2014 with signs and symptoms of back pain associated with lumbar disc prolapsed with lumbar radiculopathy, in whom conservative treatment of least 6 weeks had failed. The present study was undertaken with the aim to observe the effectiveness of caudal epidural injection of a combination of depomedrol (Methyl prednisolone acetate) along with a local anesthetic (0.5% bupivacaine) in relieving symptoms of lumbar disc prolapse with radiculopathy. Quantitative assessment was done for back pain & leg pain separately using the visual analogue scale and the functional disability was measured using Oswestry disability index (ODI) before the procedure and at regular intervals after the procedure for a period of 6 months. All the patients had an ODI more than 40% before the procedure. At 24 hours, significant pain relief was seen in all the patients. After 3 weeks, symptomatic improvement was seen in 100.0% (25/25 patients) of the cases, with good results in 68.0% (17/25, ODI 0-20%) and fair result (ODI 20-40%) in 32.0% (8/25 patients). At 6 months follow up, 60.0% (15 patients/25) of patients showed functional improvement of which with good results were seen in 52.0% (13/25) and fair result in 8.0% (2/25) and poor results in 40.0% (10/25). None of the patients had any major complications. Thus, it can be concluded that caudal epidural steroid injections are one of the safe and effective modality of treatment in back pain associated with lumbar disc prolapse with good short term results and possibly long term in some patients.

KEYWORDS: Lumbar disc prolapse, radiculopathy, caudal epidural steroid injection.

INTRODUCTION: Low back pain affects the area between the lower rib cage and gluteal folds and often radiates to thigh.^[1] and found to be a common disability in patients under the age of 40 years.^[2] The treatment and management of low back pain needs multidisciplinary approach. Patients with lumbosacral pain make up quite a significant proportion of those permanently or temporarily disabled for work and pose tremendous loss to a nation, both in financial terms as well as lost man hours. Hence prevention or reduction of prolonged disability has been recommended as the primary goal of back pain management. The natural history of lumbar disk herniation has been elucidated by means of serial imaging studies, which showed spontaneous clinical and anatomic resolution in 67-76% of patients after 1-year.^[3-6] Therefore, an invasive approach is reserved for patients failing to respond to conservative treatment.

In 1930, Evans reported that sciatica could be treated by epidural injection. The use of epidural corticosteroid injections for the treatment of axial and radicular back pain was first reported in 1953.^[7]

ORIGINAL ARTICLE

Epidural steroid injections are currently used by many medical professionals for the treatment of lumbosacral radiculopathy. Interlaminar, caudal epidural injections and transforaminal steroid injections are very much practiced worldwide to relieve back pain due to lumbar disc prolapse.

Taking into consideration of all these facts, the present study was undertaken with the aim to observe the effect of caudal epidural injection of a combination of depomedrol (Methyl prednisolone acetate) along with a local anesthetic (0.5% bupivacaine) in relieving symptoms of chronic low back pain in whom conservative treatment with rest and oral analgesics of at least 6 weeks had failed to respond.

MATERIAL AND METHODS: The study is an uncontrolled, prospective study that included 25 patients (15 males and 10 females) during the period 2013–2014 who attended pain clinic, Department of Anesthesiology, Assam medical college, Dibrugarh, Assam. The patients were selected randomly according to the following clinical criteria.

Inclusion Criteria: Patient of either sex with age above 25 years and below 55 years with chronic low back pain and/or leg pain with a positive SLR test or femoral stretch test in whom there was no relief in signs & symptoms with a 6 weeks trial of conservative treatment like rest, analgesics etc.

Exclusion criteria: The patients below the age of 25 and above 55 years, having low back pain for less than 3 months, with traumatic low back pain or acute and inflammatory low back pain, with any complication like cauda equine syndrome, caries spine, malignancy, rapidly progressing neural deficit which would need urgent surgery, bleeding diathesis etc.

Assessment Procedure: Patients who failed to respond to conservative treatment for at least 6 weeks, were taken up for the caudal Epidural Steroid Injection procedure. Preprocedural quantitative assessment of back pain and/or leg pain were recorded using Visual Analog Scale,^[8,9,10] from 0–10 (0=no pain and 10 is worst possible pain). Their basal functional efficacy was also assessed by utilizing the Oswestry Disability Index (ODI) in which scoring was done from 0-100. An ODI score of 0-20% indicates minimal disability, 21-40% indicate moderate disability, 41-60% indicate severe disability, 61-80% indicate crippled status and 81-100% indicate bed bound patients or one who is exaggerating his symptoms.^[11]

Clinical examination included straight leg rising test, femoral stretch test and also neurological examination of both the lower limbs. Investigations included complete blood count, erythrocyte sedimentation rate, random blood sugar, bleeding time, coagulation time and Magnetic Resonance Imaging (MRI) of the lumbosacral region. A proper informed consent was taken and the procedure was carried out under strict aseptic and antiseptic measures in the pain clinic operation theatre which is equipped with the necessary resuscitative equipment's and an image intensifier. Patient is asked to lie comfortably in prone position, the C-arm in AP position, the structures (Vertebral body, vertebral end plate, pedicle, facet joint, spinous process, transverse process) are identified. With the patient in prone position, the sacral hiatus was identified by palpating the sacral cornua, and an epidural needle was inserted through it into the epidural space.

The position of the needle in the epidural space was clinically confirmed by absence of subcutaneous palpation of air over the sacrum and by "whoosh", the man oeuvre if injection of air

ORIGINAL ARTICLE

and simultaneous auscultation over the lumbar spine. The position of the needle was further confirmed radio logically in both AP and Lateral views by putting 0.5 ml of non-ionic radio-opaque dye (Iohexol) to get the 'Christmas tree Appearance'. The skin is infiltrated with 2% lignocaine and after 1 minute, the injection is made with a 20 gauge epidural needle. Finally the drug Depo-medrol 80 mg (2ml) along with 15ml of 0.5% bupivacaine was injected. After the procedure, the patients were advised to lie down in supine position for 4-6 hours and monitored for any inconveniences. After the treatment as per schedule, the patients were followed up for pain relief using VAS and ODI scores, stretch signs and neurological status at 24hrs and then at 3 weeks, 3 months and then at 6 months. Most of the patients were given a single caudal epidural injection. Only few (6 patients, 24.0%) received a second injection at three weeks follow up as the patients had responded initially immediately after caudal steroid injection but the effect was short lived.

At follow-up, the functional efficiency results in patients with mild disability (ODI 0-20%) was classified as good, with moderate disability (21-40%) as fair, with those with disability of 41% and more as poor.

RESULT AND DISCUSSIONS: A total of 25 patients of chronic low back pain were included in the present study. These included 15 males and 10 female patients. Most of the patients in both males and females were found in the age group of 27-50 years. The mean weight of patients was 60.25 ± 5.5 kg. Most of the patients (85%) gave history of gradual onset of pain. Maximum patients had pain of intermittent character (85%) while (15%) had pain of continuous character.

At initial presentation, the mean VAS for back pain was 4.3 ± 0.8 (range 2-6) and leg pain was 6.2 ± 0.5 (range 5-8). All the patients had ODI more than 40% at initial presentation, with an average ODI of 49.5 ± 5.6 (44-72), of which all patients had severe functional disability (ODI 41-60%). All the patients had leg stretch sign positive but without any motor weakness.

At 24 hours, significant pain relief was seen in all the patients. At 3 weeks, the average VAS score for backache was 1.5 ± 0.8 and the decrease in the average VAS score for backache as compared to preprocedure level was 2.8. The average VAS score for leg pain at 3 weeks was 1.5 ± 0.5 with the decrease of 4.7 value in the average pain score for leg pain as compared to the pre-procedure value. Thus, a greater degree of relief was seen in leg pain as compared to back pain. At 3 months, the decrease in the average VAS score for backache and leg pain was 2.7 and 3.5 respectively. At 6 months, the decrease in the average VAS score for back pain and leg pain as compared to preprocedure level was 2.5 and 3.5 respectively which showed that the improvement in backache and leg pain score mildly decreased with time.

As regards to evaluation of functional status, at 3 weeks, 100% (25/25) of patients showed considerable functional improvement of which, 68.0% of patients showed good functional status (17/25, ODI 0-20%) whereas fair result (ODI 20-40%) was seen in 32.0% (8/25) of patient. Out of all patients, only 6 patients (24.0%) with moderate functional disability where less subjective improvement of pain was recorded at 3 weeks follow up were given a second dose of caudal epidural steroid injection. At 3 months follow up 80.0% (20 patients/25) of patients showed functional improvement of which with good results in 64.0% (16/25) and fair result in 16.0% (4/25) and poor results in 20.0% (5/25). At 6 months follow up, 60.0% (15 patients/25) of patients showed functional improvement of which with good results were seen in 52.0% (13/25) and fair result in 8.0% (2/25) and poor results in 40.0% (10/25). None of the patients had any major complications.

ORIGINAL ARTICLE

DISCUSSION: Low backache is a very common complaint for which patients seek out for care of a physician in the outpatient department in a hospital. It is estimated that 3 to 5% of patients with back pain have true radiculopathy,^[12] of the patients with acute pain, about a half recovers within a month or so without any medication or intervention.^[13] Lumbar radiculopathy is a disorder of the spinal nerve roots, resulting in a dysaesthetic sensation or pain in a pattern of lumbar or sacral nerves. When a nerve is compressed, it causes irritation and subsequent neurologic dysfunction. The pain is neuropathic in nature, whether it is acute or chronic, traumatic or degenerative. Apart from pain, the patient develops a multitude of symptoms such as burning, tingling, weakness, numbness, paraesthesia, dyesthesia etc. There are a variety of causes for nerve compression and irritation such as disc bulges or herniations, arthritis, spondylolisthesis, spinal canal stenosis, tumours, or a congenitally narrow spinal canal. The most frequently involved discs are the L4-5 and L5-S1 levels, with the L4-5 disc being more frequent.

A wide variety of treatment procedures ranging from conservative measures like bed rest, analgesics, traction, and ultrasonic therapy to surgery. Whatever the method, the treatment of disc prolapsed essentially remains symptomatic. Studies had documented the effect of epidural steroids in the symptomatic of disc prolapsed as early as 1952 when hydrocortisone was used by Robecchi and Capra.^[14] The rationale for anti-inflammatory treatment with preganglionic steroid infiltration in the relief of the preganglionic inflammation by ensuring recovery of the normal ganglioneural myelin sheath, and hence nerve function at the disease site,^[15,16] and is an effective tool for the relief of root pain caused by spondylosis or disk herniation, but the effects appear to be short lived.^[17,18]

The success rates with epidural steroid injection vary in literature but most studies report a good success rate in short term while the average success rate at 6 months has been 30-49%.^[19] In our study, at 3 weeks, 100% of the cases had good results, while after 3 months; good results were seen in 80.0% of the cases. However, the percentage of patients who had symptomatic improvement at 6 months follow up (The total number of good/fair result) was 60.0%. It is believed that the local anesthetics inhibit the pain-spasm cycle and reverberating nociceptor transmission while the corticosteroids reduce the inflammation by inhibiting the synthesis or release of pro inflammatory substances.^[20] It is estimated that as much as 40% of back surgeries fail and even in successful surgeries, pain and subsequent disability have returned after a variable period of 6 months to 20 years.^[20]

In this study, no major complications were reported except for local dull ache at the site of injection which were short lived. In conclusion, present study showed that caudal epidural steroid injection is an effective & economic modality in the treatment of the patients with lumbar disc prolapsed in centres where advanced interventions are not available. However, large controlled group for specific evaluation of its effect is recommended.

REFERENCES:

1. Frymoyer JW. Back pain and Sciatica. *N Engl J Med* 1998; 318: 291-300.
2. Engstrom JW. Back and neck pain. In: Braunwald E, Hauser SL, Fauci AS, Lango DL, Kasper DL, Jameson JL, editors. *Harrison 'principles of internal Medicine*. New York-London. Mc Graw-Hill 2001; 16: 79-90.
3. Bozzao A, Gallucci M, Masciocchi C, Aprile I, Barile A, Passariello R. Lumbar disk herniation: MR imaging assessment of natural history in patients treated without surgery. *Radiology* 1992; 185: 135-41.

ORIGINAL ARTICLE

4. Bush K, Cowan N, Katz DE, Gishen P. The natural history of sciatica associated with disc pathology. A prospective study with clinical and independent radiologic follow-up. *Spine (Phila Pa 1976)* 1992; 17: 1205-12.
5. Delauche-Cavallier MC, Budet C, Laredo JD, Debie B, Wybier M, Dorfmann H, et al. Lumbar disc herniation. Computed tomography scan changes after conservative treatment of nerve root compression. *Spine (Phila Pa 1976)* 1992; 17: 927-33.
6. Gallucci M, Bozzao A, Orlandi B, Manetta R, Brughitta G, Lupattelli L. Does postcontrast MR enhancement in lumbar disk herniation have prognostic value? *J Comput Assist Tomogr* 1995; 19: 34-8.
7. Sitzman BT. Epidural injection. In: Fenton DS, Czervionke LF, editors. *Image-guided Spine Intervention*. Philadelphia: Saunders; 2003. p. 99-126.
8. Williams AC de C, Davis HT, Chadury Y. Simple pain rating scales hide complex idiosyncratic meanings. *Pain* 2000; 85: 457-63.
9. Price DD, Bush FM, Long S, Harkins SW. A comparison of pain measurement characteristics of mechanical visual analogue and simple numerical rating scales. *Pain* 1994; 56: 217-26.
10. Mannche C, Asmussen K, Lauritsen B, Vinterberg H, Kreiner S, Jordan A. Low back pain rating scale: Validation of tool for assessment of low back pain. *Pain* 1994; 57: 317-26.
11. Fairbank JC, Pynsent PB – The Oswestry disability index. *Spine* 2000; 25: 2940-52.
12. Tarulli AW, Raynor EM. Lumbosacral radiculopathy. *Neurol clin* 2007; 25(2):387-405.
13. M Miller. *Review of orthopaedics* (4th edition), saunders; 2004.
14. Robecchi A, Capra R – Hydrocortisone (compound F): first clinical experiments in the field of rheumatology. *Minerva Med* 1952; 43: 1259-63.
15. Wittenberg RH, Oppel S, Rubenthaler FA, Steffen R. Five-year results from chemonucleolysis with chymopapain or collagenase: A prospective randomized study. *Spine (Phila Pa 1976)* 2001; 26: 1835-41.
16. Manchikanti L, Boswell MV, Singh V, Benyamin RM, Fellows B, Abdi S, et al. Comprehensive evidence-based guidelines for interventional techniques in the management of chronic spinal pain. *Pain Physician* 2009; 12: 699-802.
17. Gajraj NM. Selective nerve root blocks for low back pain and radiculopathy. *Reg Anesth Pain Med* 2004; 29: 243-56.
18. Zennaro H, Dousset V, Viaud B, Allard M, Dehais J, Sngas J, et al. Periganglionic foraminal steroid injections performed under CT control. *AJNR Am J Neuroradiol* 1998; 19: 349-52.
19. Willim KD, Park AL – Low back pain and disorder of intervertebral discs. In: Canale ST, editor. *Campbell's Operative Orthopaedics*. Vol2. 10th ed. Mosby, 2003: 1961-2003.
20. Manchikanti L, Singh V, Bakhit CE, Fellows B – interventional techniques in the management of chronic pain. *Pain Physician* 2000; 3: 7-42.

ORIGINAL ARTICLE

AUTHORS:

1. Dhrubajyoti Borgohain
2. Mituban Gogoi

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Anaesthesiology, Assam Medical College & Hospital, Dibrugarh, Assam.
2. Assistant Professor, Department of Surgery, Assam Medical College & Hospital, Dibrugarh, Assam.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

NAME ADDRESS EMAIL ID OF THE**CORRESPONDING AUTHOR:**

Dr. Dhrubajyoti Borgohain,
Assistant Professor,
Department of Anaesthesiology,
Assam Medical College & Hospital,
Dibrugarh, Assam.
E-mail: dhruba_borgohain@yahoo.co.in

Date of Submission: 03/09/2015.
Date of Peer Review: 04/09/2015.
Date of Acceptance: 05/09/2015.
Date of Publishing: 11/09/2015.