ISSN 2515-8260 Volume 09, Issue 02, 2022

A comparative study to assess the efficacy of epidural steroid injection with and without bupivacaine for low back pain patients

[1]Dr. Kamala GR, [2]Dr. Hanumantharaya GH

[1]Department of Anaesthesiology, District Hospital, Chitradurga, Karnataka, India
[2]Department of Orthopaedics, District Hospital, Chitradurga, Karnataka, India

Corresponding Author:
Dr. Hanumantharaya GH

Abstract

Low back pain is the most common problem among chronic pain disorders in middle aged population. Epidural Steroid Injection (ESI) is one of the most commonly performed non-surgical interventions [1]. Objective of study is to compare the efficacy of epidural steroid injection with & without Bupivacaine for low backache patients.

Materials and Method: Two groups of 12 selected patients with chronic low backache were randomized for midline Inter laminar Epidural injection with 80 mg Methylprednisolone acetate with saline and Methylprednisolone acetate 80mg with 0.25% Bupivacaine. All patients received 3 injections at intervals of 2 weeks. They were assessed for degree and duration of analgesia (VAS) and any adverse effects.

Results: Onset of pain relief was less in adjuvant group when compared to non-adjuvant group after ESI. VAS at the end of 6 weeks in both groups was almost same in both groups. There were no significant adverse effects.

Conclusion: Epidural Steroid Injections significantly reduce radicular pain more with Bupivacaine.

Keywords: Epidural steroid injection, bupivacaine, low backache

Introduction

Low back pain with or without radiculopathy is the most common problem among chronic pain disorders with significant economic, societal, and health impact [1, 2]. The prevalence of low back pain & sciatica reported in the Indian population ranging from 1.6% to 43% in selected groups of population [3]. Low back pain is affecting both sex of all age groups and etiology is usually found to be multifactorial. The treatments options for low backache include conservative management, epidural steroid injection and surgery. Epidural steroid injections (ESI) are one of the most commonly performed non-surgical interventions [4]. Corticosteroids with local anesthetics combination at epidural space improve the results in favour of pain relief, quality of life and patient satisfaction [5].

Materials and Methods

Prospective randomized controlled study was conducted at Department of Anesthesiology

ISSN 2515-8260 Volume 09, Issue 02, 2022

with collaboration with Department of Orthopaedics, District Hospital Chitradurga, Karnataka. Study was started from March 2020 to February 2021. 24 patients were enrolled in this study and divided into 2 groups, 12 in each group. Patients aged between 30-70 years, patients with failure of conservative management, patients who had given informed consent were included in the study. Unwilling patients, systemic or local infection at injection site, compression vertebral fractures, previous lumbar spine surgeries, coagulation disorders, patients with history of allergy to steroids and local anaesthetic drugs, diabetic neuropathy, psychiatric disorders and pregnant patients were excluded from the study. 24 patients were randomly allocated to each of 2 groups by computer generated numbers & sealed envelope method as follows:

Group 1: Epidural Steroid Injection-Methylprednisolone Acetate 80 mg and Normal Saline. Total-8 ml.
Group 2: Epidural Steroid Injection-Methylprednisolone Acetate 80mg and 0.25% Bupivacaine 10 mg. Total-8 ml.

All patients were explained about the Visual Analogue Scale (VAS) & were properly educated regarding possible success or failures of the intervention. A detailed history and examination findings were recorded according to proforma form. By palpation the desired level of lumbar inter laminar interspace is identified by trained anaesthesiologist. Epidural space was located by loss of resistance technique under aseptic precautions and injection was infiltrated at epidural space with close monitoring of patient vitals. During procedure we recorded heart rate every 15min for 2hrs, non-invasive blood pressure (NIBP) every 15min for 2hrs, VAS before procedure & after procedure. During post injections we recorded requirement of supplement analgesics, quality of life, and patient satisfaction. Each patient received a total of 3 ESI, each one at 2 weeks intervals. All patients were advised to take rest and oral analgesics. Patients who did not get adequate pain relief after 3 injections were referred for surgery.

Results and observations

Age of the patients ranged from 30-70 years. Majority of the patients were belonged to the age group 40-50 years in both groups. Both groups are comparable in age, gender and ASA grade without any statistical significance (P value<0.0001). There were no clinically significant episodes of tachycardia or bradycardia and also without significant episodes of hypotension or hypertension. The time required for the onset of pain relief in each group during study at each visit is shown in table 1. Mean time for onset was less in Bupivacaine group (Group 2) and more time in without Bupivacaine group (Group 1), which is statistically significant.

Table 1: Mean onset of pain relief (mins)

	Group 1		Group 2		P value
	Mean	SD	Mean	SD	
Dose 1 (N=24)	10.46	0.90	3.52	0.45	<0.0001
Dose 2 (N=24)	9.97	0.82	2.89	0.54	<0.0001
Dose 3 (N=24)	11.12	0.91	3.73	0.68	<0.0001

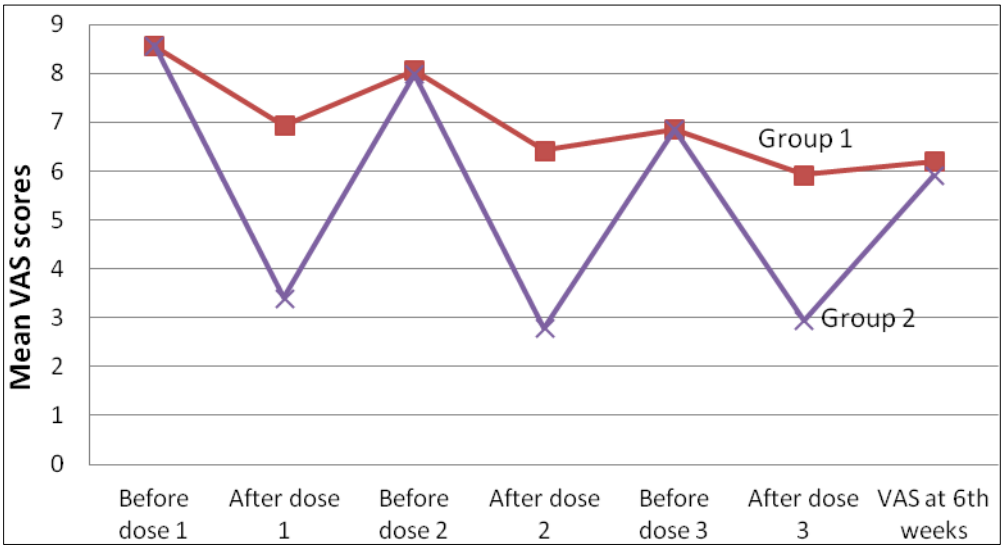
Table 2 and graph 1 shows that VAS soon after 1st, 2nd and 3rd injection were 6.93, 6.42 and

ISSN 2515-8260 Volume 09, Issue 02, 2022

5.92 respectively in group 1. The same in group 2 were 3.4, 2.79 and 2.94 respectively. We found that significant immediate improvement in VAS in group 2 was compared to group 1. However VAS after three injections at 6th weeks was found to be 6.2 and 5.9 in group 1 and group 2 respectively.

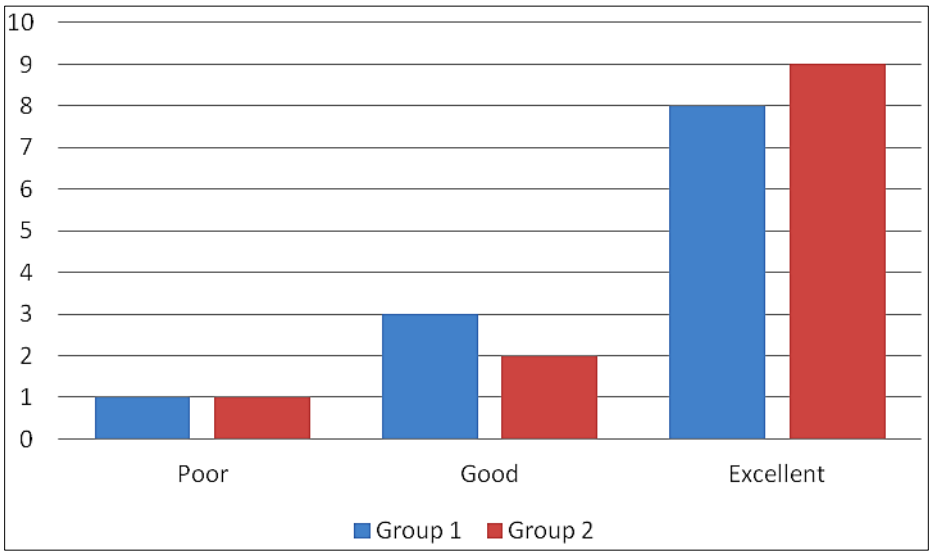
Table 2: VAS before and after each epidural injection as compared to pain at presentation.

Gr Group	Vas at presentation		Vas after 1st injection		Vas before 2nd injection		Vas after 2nd injection		Vas before 3rd injection		Vas after 3rd dose		Vas at 6th week	
Vas	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Group 1	8.56	.66	6.93	.68	8.06	.67	6.42	.72	6.85	.61	5.92	.66	6.2	.64
Group 2	8.57	.51	3.40	0.65	7.99	.43	2.79	.54	6.86	.48	2.94	.60	5.9	.52
P value	< 0.0001				< 0.0001				< 0.0001					



Graph 1: VAS changes at each visit

Transient sensory and motor disturbance was noticed in 6.42%. Motor weakness encountered in group 2 which was ceased in 30 min after the procedure. Graph 2 shows that patient satisfactions in both groups were 70.84%, 20.83%, 8.33% as excellent, good, and poor respectively.



Graph 2: Comparison of patient satisfaction in both the groups

ISSN 2515-8260 Volume 09, Issue 02, 2022

Discussion

Low back pain is a common, frequently recurring condition seen at orthopaedic emergency department and at pain clinic. Aetiology of low back pain is usually multi factorial in adults.[6] Intervertebral disc herniation, lumbar spinal canal stenosis, and osteoarthritis of spine are the most common causes of chronic radicular low back pain. Radicular pain is the result of aseptic inflammation of the nerve root in the epidural space provoked by of disc material and compression of the nerve root vasculature. Benoist M *et al.* [7] inferred an inflammatory process as one of the main causes of common sciatica, disc herniation, radiculitis and lumbar canal stenosis. Epidural steroids inhibit production of inflammatory mediators and neural transmission in nociceptive C fibers. Beliveau *et al.* showed that epidural injection of methyl prednisolone was more effective in long standing back pain and sciatica [8].

The effectiveness of these ESI injections is increased if they are used in the first weeks after the onset of pain and followed by physiotherapy. Using adjuvants like clonidine, bupivacaine, tramadol has showed a tremendous increase in the analgesic efficacy, onset and the duration of pain relief of ESI with methylprednisolone as assessed by the VAS score and the patient satisfaction score [9]. Gupta AK *et al.* [10] found that improvement in patient's return to work status, drug dose intake reduction, and the VAS score in epidural injection of local anesthetic agent and corticosteroids. Many patients in our study got excellent pain relief (VAS 8.57 to 3.4) in Bupivacaine group soon after the 1st injection and moderate pain relief (VAS 6.93) in the rest. Pain relief as per VAS in Bupivacaine group showed improvement (8.57 to 2.94) unlike the group without adjuvant (8.56 to 5.92).

Derincek *et al.* [11] studied epidural steroid injection (ESI) in patients with symptomatic lumbar herniated intervertebral discs. They found good results with short duration of symptoms and high percent of canal compromise. Patient satisfaction seems to be a complex response with actual, psychological and social components. In our study all patients in with Bupivacaine group reported full satisfaction due to excellent pain relief. Transient sensory and motor disturbance was noticed in 6.42%. Motor weakness encountered in Bupivacaine group. There were no major complications

The limitations of this study are small size and limited follow up. Finally we conclude that epidural steroid injections reduce the period of hospital stay, analgesic intake & helps in early rehabilitation. Short-term benefit is specially noticed when combined with Bupivacaine and steroids.

Conflict of interest: Nil.

Source of income: None.

References

1. Parr AT, Diwan S, Abdi S. Lumbar interlaminar epidural injections in managing chronic low back and lower extremity pain: a systematic review. Pain Physician. 2009;12(1):163-88.
2. Owlia MB, Salimzadeh A, Alishiri G, Haghighi. A comparison of two doses of corticosteroid in epidural steroid injection for lumbar radicular pain. Singapore Med J. 2007;48(3):241-5.
3. Konstantin K, Dunn KM. Sciatica: review of epidemiological studies and prevalence estimates. Spine (Phila Pa 1976). 2008;33:2464-72.
4. Maher CG. Effective Physical Treatment for Chronic Low Back Pain. Ortho Clin North Amer, 2004, 57-64.
5. Abdi S, Datta S, Trescot AM, Schultz DM, Adlaka R, Atluri SL, *et al*. Epidural steroids

ISSN 2515-8260 Volume 09, Issue 02, 2022

in the management of chronic spinal pain: a systematic review. Pain Physician. 2007 Jan;10(1):185-212.
6. Benzon HT. Epidural steroid injections for low back pain and lumbosacral radiculopathy. Pain. 1986;24:277-95.
7. Benoist M, Boulu P, Hayem G. Epidural steroid injections in the management of low-back pain with radiculopathy: an update of their efficacy and safety. European Spine Journal. 2012 Feb;21(2):204-13.
8. Beliveau P. A comparison between epidural anesthesia with and without corticosteroid in the treatment of sciatica. Rheumatol Phys Med. 1971;11:40-45.
9. Manchikanti L, Buenaventura RM, Manchikanti KN, Ruan X, Gupta S. Effectiveness of therapeutic lumbar transformational epidural steroid injections in managing lumbar spinal pain. Pain Physician, 2012 May/June, 15(3).
10. Gupta AK. Role of epidural medication in the treatment of resistant low back pain. J Indian Med Asoka. 1996;6:224-6.
11. Derincek A, Eker E, Pourbagher A, Cinar MB, Ozalay M. Lumbar epidural steroid injection: is the success rate predictable: The Journal of The Turkish Society of Algology. 2011 Oct;23(4):147-53.