



COMPARISON OF CLINICAL EFFICACY BETWEEN METHYLPREDNISOLONE ACETATE VERSUS TRIAMCINOLONE ACETONIDE FOR LUMBAR EPIDURAL STEROID INJECTION IN THE MANAGEMENT OF LOW BACK PAIN AND SCIATICA

Anaesthesiology

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ABSTRACT

Background and Aims: Low back pain and sciatica is a common clinical condition. The present study was carried out to compare the clinical efficacy of injecting epidural Methylprednisolone Acetate and Triamcinolone Acetonide in the management of low back pain and sciatica and to evaluate the effectiveness of pain relief. **Methods:** This is a prospective randomised controlled study of 60 patients of either sex aged between 18 to 70 years decided into 4 groups; two groups are for low back pain and two groups are for sciatica patients. Group which contains Methylprednisolone was given Methylprednisolone Acetate 40mg with 2ml of Bupivacaine 0.5% plain diluted up to 10ml and group which contains Triamcinolone was given Triamcinolone Acetonide 40mg with 2ml of 0.5% Bupivacaine plain diluted up to 10ml of normal saline into the lumbar epidural space. **Results:** Patients in all four groups were comparable with McGill pain questionnaire, Pain vision score and Visual pain analogue score; before lumbar epidural block and on the day 1,3,7,15,30 after giving the block by using unpaired t-test. The mean differences of all three scores was statistically significant with P value less than 0.05 for low back pain patients and for sciatica patients. No major complications were reported in patients of any of the groups. **Conclusion:** Methylprednisolone Acetate was found to be more efficacious for lumbar epidural steroid injection in the management of low back pain and sciatica than Triamcinolone Acetonide.

KEYWORDS

Low back pain, sciatica, lumbar epidural steroid injection, Methylprednisolone Acetate, Triamcinolone Acetonide

INTRODUCTION

Chronic low back pain is a chronic pain syndrome in the lower back region, lasting for at least 3 months. The prevalence of chronic low back pain in adults has increased more than 100% in the last decade and continues to increase dramatically in the aging population, affecting both men and women in all ethnic groups, with a significant impact on functional capacity and occupational activities.⁽¹⁾ In India, back and neck pain is ranked second leading cause of years lived with disability after iron-deficiency anaemia. Prevalence in Indian population ranges from 6.2% to 92% more prevalent in the age group of 30–55 years.⁽²⁾ Sciatica is a debilitating condition in which pain and/or paraesthesia in the sciatic nerve distribution or an associated lumbosacral nerve root. Sciatica is specific to the pain that is a direct result of sciatic nerve or sciatic nerve root pathology. The sciatic nerve is made up of the L4 through S2 nerve roots, which coalesce at the pelvis to form the sciatic nerve.⁽³⁾ In general an estimated 5%-10% of patients with low back pain have sciatica.⁽⁴⁾ Epidural steroid injection is being slowly established as liable mode of nonsurgical interventions for back and leg pain symptoms.⁽⁵⁾ Epidural steroid injections are a common treatment option for many forms of lower back pain and leg pain. They have been used for decades and are considered an integral part of the nonsurgical management of sciatica and lower back pain. The injection is named an epidural steroid injection because it involves injecting a local anaesthetic and a steroid medication directly into the epidural space that surrounds the spinal cord and nerve roots.⁽⁶⁾ The goals of an epidural steroid injection are to Control pain by reducing inflammation in and around the nerve roots, improve mobility and function in the lower back and legs, allow the patient to participate in and make progress with a comprehensive physical therapy and rehabilitation program.⁽⁷⁾ The present study was carried out to compare the clinical efficacy of injecting epidural Methylprednisolone and Triamcinolone in the management of low back pain and sciatica and to evaluate the effectiveness of pain relief and to compare and study the patient satisfaction and improvement in quality of life.

MATERIALS AND METHODS

After obtaining approval from Institute's Ethics Committee and written consent from the patients, a prospective, single-blind study was conducted in thirty patients of either sex suffering from low back pain and thirty patients of either sex suffering from sciatica. Patients were divided into four groups of 15 patients each. Group MB and Group TB were for low back pain patients, received injection Methylprednisolone Acetate 40mg with injection Bupivacaine 0.5% plain 2ml diluted up to 10ml of normal saline and injection Triamcinolone Acetonide 40mg with injection Bupivacaine 0.5% plain 2ml diluted up to 10ml of normal saline respectively. Group MS

and Group TS were for sciatica patients, received injection Methylprednisolone Acetate 40mg with injection Bupivacaine 0.5% plain 2ml diluted up to 10ml of normal saline and injection Triamcinolone Acetonide 40mg with injection Bupivacaine 0.5% plain 2ml diluted up to 10ml of normal saline respectively.

Patients aged between 18 to 70 years, capable of giving consent, whose pain not relieved by analgesics or conservative treatment were included in the study. Patients with local or systemic infection, bleeding diathesis; and patients with comorbidities (i.e., uncontrolled hypertension, diabetes mellitus etc.,) were excluded from study. The patients were explained about Visual Analogue Scale (VAS) score, McGill pain questionnaire score, Pain vision score in their own vernacular language and baseline score was noted. After that, Venous cannulation was done in all patients taking aseptic precautions. Injection DNS [5% Dextrose+0.9% NaCl] with multivitamin 500ml iv slowly (in non diabetics) OR Injection NS [0.9% NaCl] with multivitamin 500ml iv slowly (in diabetics), Injection Ondansetron 8mg, Injection Pantoprazole 40mg iv slowly 30 minute before lumbar epidural block. With the patient lying prepped and in a left lateral position where knees were drawn up to the chest, hips and shoulders should be kept vertical and back should kept in position of flexion at edge of table. The patient was counselled well and asked to relax and take deep breaths. The skin over the affected area of low back was scrubbed with povidone iodine and alcohol soaked gauze pieces to maintain asepsis and antisepsis. Then it was cleaned with a sterile gauze piece and draped using a sterile drape towel. After explaining to the patient the procedure of the lumbar epidural steroid injection, given via interlaminar approach. The interlaminar space between two contiguous vertebrae is identified. Next, the skin and underlying tissues are injected with local anaesthetic (e.g., Lignocaine). Using a midline or paramedian approach between the spinous processes, an epidural spinal needle is inserted into intended injection site. From superficial to deep, the needle penetrates the skin, subcutaneous tissue, supraspinous ligament (median approach) or paraspinal muscles (paramedian approach), and the ligamentum flavum. The needle is then advanced using a loss of resistance syringe filled with 2ml of air or normal saline. As the needle passes the ligamentum flavum and enters the ligamentum flavum and enters the posterior epidural space, a sudden loss of resistance will occur allowing the syringe to inject a minimal amount of air or normal saline into epidural space due to the change in pressure. Once the epidural space is confirmed, steroid with local anaesthetics is injected into epidural space. Finally, the needle is then withdrawn, and pressure is maintained at the injection site to prevent bleeding.

All the patients were monitored for Visual Analogue Scale score,

McGill pain questionnaire score, Pain vision score on 1st, 3rd, 7th, 15th, and on 30th day through visit at the pain clinic. The primary outcome was to measure the intensity of the pain relief using Visual Analogue Scale (VAS) score, McGill pain questionnaire (MPQ) score, Pain vision score. Secondary outcome was to compare and study the patient satisfaction and improvement in quality of life and watch for any adverse events following epidural injection in any of the group. Quantitative data variables were presented with the help of mean and standard deviation. The statistical analysis was done by using unpaired T-Test for quantitative data in between two groups. Significance of P value was suggested as follows: P value was more than 0.05 considered statistically insignificant; P<0.05 was considered statistically significant and P<0.001 was considered highly significant.

RESULTS

Patients in all for group were comparable with respect to their demographic profile (Table 1)

	Group MB (MPQ)	Group TB (MPQ)		Group MB (pain vision score)	Group TB (pain vision score)		Group MB (VAS score)	Group TB (VAS score)	
	Mean±SD	Mean±SD	P value	Mean±SD	Mean±SD	P value	Mean±SD	Mean±SD	P value
Before block	58 ±7.62	58±6.41	1	717.8±111.99	734.2±110.2	0.7	7.73±1.33	7.8±1.16	0.88
After block 1 days	32.46±4.91	41.4±2.18	<0.001	328.4±41.65	510.4±17.16	<0.001	4.4±0.61	5.2±0.4	<0.001
3 days	27.06±4.12	37.67±2.5	<0.001	285.53±35.67	478.73±26.14	<0.001	3.46±0.49	4.73±0.45	<0.001
7 days	22 ±3.42	33.73±2.74	<0.001	242.2±33.56	444.54±36.74	<0.001	2.53±0.49	4.2±0.4	<0.001
15 days	18.33±2.62	29±2.71	<0.001	202.4±31.07	402.2±40.17	<0.001	1.93±0.25	3.53±0.5	<0.001
30 days	15.06±3.33	26±2.90	<0.001	180.27±36.52	369.46±41.28	<0.001	1.13±0.34	2.86±0.33	<0.001

SD= Standard Deviation

The mean McGill Pain questionnaire, Pain vision score, VAS score were statistically significant (P<0.05) from baseline during the follow-

	Low Back Pain Patients			Sciatica Patients		
	Group MB	Group TB	P Value	Group MS	Group TS	P Value
AGE (YEARS) MEAN ± SD	52.6 ±14.36	48.87 ±13.08	0.478	57.13 ±11.94	51.67 ±9.54	0.191
SEX (M:F)	2:3	1:3	-	2:3	1:3	-

SD= Standard Deviation

The mean McGill Pain questionnaire, Pain vision score, VAS score were statistically significant (P<0.05) from baseline during the follow-up period of study on 1st, 3rd, 7th, 15th, 30th day; however, the scores in Methylprednisolone Acetate group were significantly lower as compared to the Triamcinolone Acetonide group in low back pain patients. (Table-2)

up period of study on 1st, 3rd, 7th, 15th, 30th day; however, the scores in Methylprednisolone Acetate group were significantly lower as compared to the Triamcinolone Acetonide group in sciatica patients. (Table-3)

	Group MS (MPQ)	Group TS (MPQ)		Group MS (pain vision score)	Group TS (pain vision score)		Group MS (VAS score)	Group TS (VAS score)	
	Mean±SD	Mean±SD	P value	Mean±SD	Mean±SD	P value	Mean±SD	Mean±SD	P value
Before block	54.94 ±9.63	58.2±10.17	0.39	704.53±125.65	722.6±134.63	0.71	7±1.37	7.2±1.65	0.73
After block 1 days	44.4±4.26	48.66±5.35	0.03	524.26±27.45	557.86±47.72	0.03	5±0.36	5.46±0.49	0.008
3 days	41.14±3.40	45.67±5.27	0.012	492.4±31.44	525.86±52.64	0.05	4.47±0.48	5±0.36	0.003
7 days	37.67 ±2.67	42.94±4.02	<0.001	460.73±36.99	494.26±47.44	0.04	3.93±0.25	4.73±0.44	<0.001
15 days	33.53±2.60	40±3.35	<0.001	423.2±35.45	457.6±46.32	0.03	3.4±0.49	4±0.36	<0.001
30 days	29.67±1.65	36.53±2.87	<0.001	390.54±23.52	430.2±50.69	0.012	2.94±0.25	3.67±0.47	<0.001

SD= Standard Deviation

Except minor complications such as pain at injection site which was resolved within the next few days without any sequelae, no major complication was reported in patients of any of the group.

DISCUSSION

The prospective, randomized, single-blind study conducted on 60 patients of chronic low back pain and sciatica pain showed that lumbar epidural steroid injection via interlaminar route provided significant improvement in all three pain scores and improvement in pain relief and general happiness of the patients. However, the relief in low back pain and sciatica was significantly greater in patients who received interlaminar epidural steroid injection with injection Methylprednisolone Acetate 40mg at 1st, 3rd, 7th, 15th, 30th day of follow-up period than injection Triamcinolone Acetonide.

R Runu et al.⁽⁸⁾ conducted study on epidural steroid injections in management of low back pain and sciatica on 52 patients by using VAS score for 3 months. The conclusion of the study is in correlation with our study result that lumbar epidural steroid injection has pain relief effect on low back pain and sciatica pain.

Fares E Sayegh et al.⁽⁹⁾ conducted a study on efficacy of steroid and non steroid caudal epidural injections for low back pain and sciatica. Steroid-group's patients receiving 12 mL of xylocaine 2% and 1 mL of betamethasone. Water for Injection-group's patient receiving 12 mL of xylocaine 2% and 8 mL of Water for Injection. Caudal epidural injection containing steroid preparations demonstrated better and faster efficacy. In our study, we also used steroid with local anaesthetics for lumbar epidural injection for better and faster efficacy.

Deborah L Rabinovitch et al.⁽¹⁰⁾ conducted a study on influence of

lumbar epidural injection volume on pain relief for radicular leg pain and/or low back pain. The study of the result suggests a positive correlation between larger volumes of fluid injected in the epidural space and greater relief of radicular leg pain and/or low back pain.

CONCLUSION

We conclude that epidural steroid injections with Methylprednisolone Acetate were significantly more effective than Triamcinolone Acetonide in patients with chronic low back pain and sciatica in terms of total duration of pain relief and improvement in quality of life. No serious complication was encountered in patients of any of the group following epidural steroid injections.

Conflicts of Interest

There are no conflicts of interest.

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