SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 4.
Issue: 2.
Page N. 210-214
Year: 2020

Original Article www.wjahr.com

COMPARISON OF DEXAMETHASONE AND TRIAMCINOLONE AS EPIDURAL STEROIDS IN LOW BACK PAIN

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Received date: 11 February 2020 **Revised date:** 01 March 2020 **Accepted date:** 22 March 2020

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ABSTRACT

Epidural steroids are used in the treatment of radicular and other spinal pain of an inflammatory origin emanating from the cervical, thoracic, and lumbar spine. The use of epidural administration of steroids is to produce higher local concentrations at an inflamed nerve root and other areas of inflammation in the spinal canal area. Different steroid preparations have dissimilar physico chemical properties and these may affect outcomes and side-effects. There is an ongoing debate with regard to the use of particulate and non-particulate steroids for epidural injections for chronic pain patients. Design. One hundred patients were randomized to receive lumbar transforaminal epidural steroid injections (N = 50) with either dexamethasone 7.5 mg, or with triamcinolone acetate 40 mg (N = 50). Measurement were taken before treatment and one month after treatment using ascale, short McGill pain questionnaire, and re vised Oswertry Back Disability Index Conclusion. In this study, dexamethasone and triamcinolone treatments were shown to have different effects on low back pain with sciatica, with triamcinolone being more effective than dexamethsone in lumbar radiculopathy.

KEYWORDS: Transforaminal Epidural Injection; Corticosteroid; Dexamethasone; Triamcinolone; low back pain, Lumbar Disc Herniation.

INTRODUCTION

When nerve roots exiting the spinal column are compromised, pain may occur that radiates into lower extremity. This is known as lumbar radiculopathy.[1] Transforaminal injection of steroids is a procedure used to treat radicular pain.[2,5] The injection of steroid is thought to be integral in decreasing inflammation around the affected nerve tissue.[6,7] leading to a reduction in pain.

The preparation of steroids used in the epidural space can be divided into 2 groups – particulate such as methylprednisolone, betamethasone, and triamcinolone; and non-particulate like dexamethasone phosphate. Particulate steroids have longer a duration of action due to a local depot effect resulting in continuous release of the active drug from the injection site over a long time period.[6] On the other hand non-particulate steroids are water soluble steroid with small particle size and limited aggregation.[7] This results in rapid clearance from the spinal canal and a short duration of action.[8] So one anticipates a long-lasting relief of symptoms in patients receiving epidural injection with particulate steroids compared to those who receive non-particulate steroids.

Though epidural steroids have been used in clinical practice for decades now, several case reports have documented potential complications like paraplegia secondary to spinal cord infarction associated with the use of particulate steroids.[9-10] Occlusion of the segmental artery accompanying the nerve root by the particulate steroid or embolization of the steroid through the vertebral artery are the possible etiologies involved.[11]

METHODS

The study was conducted after written informed consent was obtained from all subjects. One hundred consecutive patients were enrolled in the study, and were followed for four weeks. Included were patients aged between 18 and 80 years, with a diagnosis of lumbar radicular pain based on an appropriate distribution of pain, and MRI showing nerve root compromise. Exclusion criteria were: chronic use of oral steroid medication, oral, peripheral, or epidural steroid use in the last three months, having an oral temperature greater than 100.4°F, pregnancy, cognitive impairment, inability to give consent, use of aspirin, or heparin use in the previous two weeks,or history of bleeding disorders.[12] Patients were randomly

allocated to one of two groups. Those in the first group received 7.5 mg of dexamethasone and those in the second group received 40 mg of triamcinolone acetonide. All injections were performed by the same doctor. Each subject was placed in the prone position. Under fluoroscopic guidance and, after sterile preparation, draping, and local anesthesia, a 23-gauge, 3.5-inch spinal needle was gently advanced on oblique view to the safe-triangle, which is formed by the pedicle, a tangential base that corresponds to the exiting nerve root, and the lateral border of the vertebral body. Both anteroposterior and lateral fluoroscopic projections confirmed proper needle placement. At each level, 0.5 mL of contrast medium was injected to confirm the position.

Once an adequate flow of contrast to the target area was documented using real-time fluoroscopy and no blood or cerebrospinal fluid was aspirated. And in the absence of intravascular injection, the physician injected the allocated steroid diluted with 1 mL of 1% lidocaine PER SEGMENT, After injecting into the epidural space, the needle was withdrawn and the patient laid in a supine position for at least 15 minutes. The patient's pulse, blood pressure and oxygen saturation were monitered throughout the procedure and thereafter for half an hour. Blood glucose levels were monitored 24 hours after the procedure and all the patients were screened thereafter for any major or minor complications. Bed rest was initially advised with limited activity for a period of one month. Activity was gradually increased to walking 2-3 hours/day. Lifting of heavy weights and strenous exercises were forbidden for 3-6 months. Patients were allowed after the second week, one month, 3 months and 6 months for pain, patient satisfaction and for any side effects of the drugs (nausea, vomiting, heart burn) during their follow-up visits in both groups. Patients were advised to take analgesics, whenever needed after 3 months. Reduction of visual analogue scale by 50% were considered as successfully treated, while patients having no relief at all or very less reduction of VAS were referred to neurosurgery department for interventional management. Statistical analysis was performed using statistical software (SPSS) version 10. An unpaired t-test was used to compare demographic variables (age, weight) and pain scores (VAS) between the two groups. All results were expressed as mean ± SD (standard deviation). Patients' satisfaction score, symptoms of radiculopathy and minor complications in both groups were compared by the chi-square test. A p-value less than 0.05 was considered statistically significant.

RESULTS

The 100 patients were randomized into equal groups of 50. Before treatment, the two groups did not differ significantly with respect to age, gender, or segment treated The mean values of pain scores before treatment were not significantly different between the two groups. But the trimacinolone group had significantly more patients with higher scores, and fewer with mid-range scores.

At one month after treatment, both groups significantly lower than improved their mean pain scores, but the triamcinolone group achieved a score that was significantlylower than that of the dexamethasone group. The symptoms and duration of sciatica i.e. limitation of activity, SLR, sensory deficit (sensation of touch, temperature and skin prick) in all the dermatomal levels, muscle power (against gravity and external force) of both lower limbs, radiation of pain to right or left leg and any complaint of backache were statistically not significant in the two groups. Patients in both groups were assessed for improvements in pain score. A lower pain score on VAS was observed in the tramicinolone group compared to the dexamethasine group in acute stages of treatment i.e. after the second week and one month follow-up ($p < 0.05$), while less significant difference was observed in VAS in the chronic stages of treatment in both groups ($p > 0.05$, Table II). The patient's satisfaction after pain alleviation was noticed in 80% and 76% of the patients in the triamicinolone group during the initial periods of 2 weeks and 1 month, while 52% and 68% of patients were satisfied after 3 months and 6 months of duration respectively. Patients satisfaction in the dexamethasone group was comparatively less, with improvement in pain score after 2nd week, 1st month, 3 months and 6 months of duration.

The percentage of patients were 52%, 48%, 56% and 64% respectively for increasing duration. No major complications were reported in the studied groups. The incidence of minor complications were small and were treated in time All the events were resolved without morbidity.

Table I: Symptoms of radiculopathy in two groups.

Symptoms	Triamcinolone group n=50(%)	Dexa Group n=50 (%)	P-Value
Limitation of activity (%)	30(60)	24(48)	1.000 NS
SLR test positive (%)	40(80)	42(80)	1.000 NS
Sensory deficit (%)	6(12)	8(16)	1.000 NS
Decreased Ms power (%)	2(4)	4(16)	1.000 NS
Radio C/R (%)	20/30(40/60)	24/26(48/52)	1.000 NS
Back ache (%)	36/14(72/28)	40/10(80/20)	1.000 NS
Cauda equina	Nil	Nil	1.000 NS

Table II: Visual Analogue Scale (VAS) in both groups.

Duration	Steroid group n=25 VAS (mean±SD)	Conservative Group n=25 VAS (mean±SD)	P-Value
2nd Week	4±1.4	8±1.2	<0.0001 Significant
1 Month	4±1.5	10±1.48	<0.0001
3 Months	9±1.50	11±1.10	0.1852(NS)
6 Months	12±1.45	13±1.30	0.2064(NS)

Table III: Patient's Satisfaction score with improvement of pain.

Duration	Steroid group n=25 (%)	Conservative Group n=25 (%)	P-Value
2nd Week	40(80)	26(52)	0.3752
1 Month	38(76)	24(48)	0.3648
3 Months	26(52)	28(58)	1.00
6 Months	18(68)	32(64)	1.00

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	Triamichore G	Dexomehano I N-5
	N-50	N-5
M:F	26;24	23;27
Age(yr)	55.5±14.8	60.5±10.8
Male	58.2+17.4	59.4±13.2
Female	53.2±12.0	62.5±9.8

DISCUSSION

The intractable pain of sciatica is mainly caused and precipitated by inflammatory mediators. There is a close relation between disk degeneration and matrix metalloproteinase release.[12] Chronic nerve root compression due to lumbar stenosis has been shown to cause venous congestion, intramural edema, blockade of nerve conduction and the release of neurotoxic substances in animal studies. The role of steroids in such conditions is to impair prostaglandin synthesis, possibly improve nerve root blood supply and to alter chemotoxic mediator flow.[13] Similarly, NSAIDS (non-steroidal anti-inflammatory agents) when given either locally or systemically play a role in abolishing the signs and symptoms of radiculopathy. In this regard, ESI is a kind of local therapy, It is preferable over systemic therapy, because has a lower rate of systemic side effects like adrenal suppression, increase in blood sugar level and osteoporosis, while it gets a higher concentrations of the drug at the diseased site.[14] The incidence of serious complications such as epidural haematoma, abscess formation and arachnoiditis, are noticed to be very few in expert hands. Mild or less serious complications which may occur include flushing, post injection flare hyperglycemia, hypertension, backache, headache and central nervous system symptoms.[15] Runn reported that 59% of patients benefited from epidural steroid. They were able to perform daily living at the end of 3 months.[16] excellent to good pain relief in 93.35% of epidurally-treated cases. A study observed better results in patient streated with epidural steroids and recommended ESI in the acute phase of the conservative treatment of lumbo sciatic pain.[17] Postoperative pain decreased in the steroid treated group during the first postoperation week, but not at 12 months postoperation.[18] The role of epidural steroid injections in the management of acute radicular pain due to herniated nucleus pulposus is to provide early pain relief.[19] a study observed improved results after 1 month of ESI, and that the maximal beneficial effect of ESI was experienced in acute cases and was considered to be due to individual variations in receptor response to long-acting epidural steroids.[20] Although there was less improvement in chronic cases, even a 50% or less improvement in VAS after a 3 month postinjection period can reduce the need for surgery, if there is no neurological impairment.[21] showed sustained pain relief with ESI. According to Yang *et al.,* ESI reduces the need for surgical decompression.[22] The present results were similar to what is found in previous studies. Satisfactory results were achieved regarding improvement of VAS and patient satisfaction score, during the 2nd week and 1st month post-injection follow-up in patients studied with steroids. Patients in the conservative group were moderately improved with reduction of pain by 50%. Long-term treatment showed almost equal reduction of VAS and patient satisfaction in both the studie Some physicians prefer low dose epidural steroids in hypertensive and diabetic patients to reduce the incidence of post-injection flares, flushing, and hyperglycaemia compared to high dose steroids in epidural space. According to them, both doses are equally effective in improving VAS in patients having radiculopathy.[23] Eighty milligrams of methylprednisolone was used in the studied group. Only 3 patients in the steroid group showed increased blood levels of sugar after 24 hours post-procedure (> 180

mg/dl), although they did not have any history of diabetes. Epidural steroid injections under fluoroscopic control are found to be 93% effective in some studies because of the correct placement of the needle in the epidural space.[24] Some physicians use more than one ESI at different time intervals. However, when placed in the correct position a single injection is as effective as multiple injections.[23-24] The volume injected is usually 1-5 ml, although some authors use 10 ml or more, In this study, a single lumbar epidural steroid injection of 8 ml was prepared to be injected into the epidural space by an expert anaesthetist during the follow-up of the patients from 2 weeks to 24 weeks, ESIs in acute stages of the symptoms were beneficial compared to the conservative treatment, while long-term benefit was not significant in either of the groups

CONCLUSION

For the short-term relief of lumbar radicular pain, transforminal injection of triamcinolone is more effective than transforaminal injection of dexamethasone, but this apparent superiority still needs to be corroborated by improvement in function and other secondary outcomes Although lumbar epidural steroids are effective treatment for sciatica, the importance of conservative management cannot be denied.

REFERENCE

1. Cotugno DFA. De Ischiade nervosa commentarius. Naples, Fratres Simonios, 1764.
2. Putti V. New conceptions in the pathogenesis of sciatic pain. *Lancet*, 1927; 2: 53-60.
3. Mixter WJ. Historical perspective. *Spine*, 1998; 23: 2363-2366.
4. Kocher T. die Verletzungen der Wirbelsaule zugleich als Beitrag zur Physiologie des menschlichen Ruckenmarks. *Mitt az Grenzgeb d Med u Chir*, 1896; 1: 415-480.
5. Mixter WJ, Barr JS. Rupture of the intervertebral disc with involvement of the spinal canal. *N Eng J Med*, 1934; 211: 210-215.
6. Manchikanti L, Singh V, Kloth D et al. Interventional techniques in the management of chronic pain: Part 2.0. *Pain Physician*, 2001: 4: 24-96.
7. Kepes ER, Duncalf D. Treatment of backache with spinal injections of local anesthetics, spinal and systemic steroids. *Pain*, 1985; 22: 33-47.
8. Benzon HT. Epidural steroid injections for low back pain and lumbosacral radiculography. *Pain*, 1986; 24: 277.
9. Valat JP, Giraudeau B, Rozenberg S, Goupille P, Bourgeois P, Micheau-Beaugendre V, *et al*. Epidural corticosteroid injections for sciatica: a randomised, double blind, controlled clinical trial. *Ann Rheum Dis*, 2003; 62: 639-43.
10. Delport EG, Cucuzzella AR, Marley JK, Pruitt CM, Fisher JR. Treatment of lumbar spinal stenosis with epidural steroid injections: a retrospective outcome study. *Arch Phys Med Rehabil*, 2004; 85: 479-84.
11. Yang SC, Fu TS, Lai PL, Niu CC, Chen LH, Chen WJ. Transforaminal epidural steroid injection for discectomy candidates: an outcome study with a minimum of two-year follow-up. *Chang Gung Med J*, 2006; 29: 93-9.
12. Buttermann GR. Treatment of lumbar disc herniation: epidural steroid injection compared with discectomy. A prospective, randomized study. *J Bone Joint Surg Am*, 2004; 86: 670-9.
13. Owalia MF, 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: 241-5.
14. 22. Price CM, Rogers PD, Prosser AS, Arden NK. Comparison of the caudal and lumbar approaches to the epidural space. *Ann Rheum Dis*, 2000; 59: 879-82.
15. Arden NK, Price C, Reading I, Stubbing .J, Hazelgrove J, Dunne.C, *et al.* A multicentre randomised-controlled trial of epidural corticosteroid injections for sciatica: the WEST study. *Rheumatology* (Oxford), 2005; 44: 1399-406.
16. Karppinen J, Malmivaara A, Kurunlahti M, Kellonen E, Pienimaki T, Niemenin P, *et al.* Periradicular infiltration for sciatica: a randomized-controlled trial. *Spine* (Phila Pa 1976), 2001; 16: 1059-67.
17. Carette S, Leclaire R, Marcoux S, Morin F, Blaise GA, St. Pierre A, *et al.* Epidural corticosteroid injections for sciatica due to herniated nucleus pulposus. *N Engl J Med*, 1997; 336: 1634-40.
18. Bartynski WS, Grabovac SZ, Rothfus WE. Incorrect needle position during lumbar epidural steroid administration: Inaccuracy of loss of air pressure resistance and requirement of fluoroscopy and epidurography during needle insertion. *Am J Neuroradiol*, 2005; 26: 502-505.
19. Liu SS, Melmed AP, Klos JW, Innis CA. Prospective experience with a 20-gauge Tuohy needle for lumbar epidural steroid injections: Is confirmation with fluoroscopy necessary? *Reg Anesth Pain Med*, 2001; 26: 143-146.
20. Datta R, Upadhyay KK. A Randomized clinical trial of three differen agents for treatment of low backache through the caudal route. *MJAFI*, 2011; 67: 25-33. 48. Hjermstad MJ, Fayers PM, Haugen DF, Caraceni A, Hanks GW, Loge JH, Fainsinger R, Aass N, Kaasa S; European Palliative Care Research Collaborative (EPCRC). Studies comparing numerical rating scales, verbal rating scales, and visual analogue scales for assessment of pain intensity in adults: A systematic literature review. *J Pain Symptom Manage*, 2011; 41: 1073-1093.
21. Ponce de Leon S, Lara-Muñoz C, Feinstein AR, Wells CK. A comparison of three rating scales for measuring subjective phenomena in clinical research. II. Use of experimentally controlled visual stimuli. *Arch Med Res* 2004; 35:15739. Somayaji

HM, Saifuddin AM, Casey AF, Briggs TF. Spinal cord infarction following therapeutic computed tomography-guided left L2 nerve root injection. Spine, 2005; 30: E106–8.
22. Glaser SE, Falco FM. Paraplegia following a thoracolumbar transforaminal epidural steroid injection: a case report. Pain Physician, 2005; 8: 309–14.
23. Rozin L, Rozin R, Koehler SA, et al. Death during transforaminal epidural steroid nerve root block (C7) due to perforation of the left vertebral artery. Am J Forensic Med Path, 2003; 24: 351–5.
24. Tiso RL, Cutler T, Catania JA, Whalen K. Adverse central nervous system sequelae after selective transforaminal block: The role of corticosteroids. Spine J., 2004; 4: 468–74.
25. Brouwers PJAM, Kottnik EJBL, Simon MAM, Prevo RL. A cervical anterior spinal artery syndrome after diagnostic blockade of the right C6-nerve root. Pain, 2001; 91: 397–9.