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Selective nerve root block in lumbar radiculopathy in lumbar disc prolapse

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Abstract

Background: Use of SNRB in lumbar disc prolapse to relieve lumbar radicular pain has been in practice during recent times. We conducted this prospective study to evaluate the pain relief following SNRB using steroid injection.

Materials and Methods: This was a prospective study conducted on 60 patients aged 25 to 60 years, of both gender with complaints of low backache with radiculopathy, unilateral, or bilateral, not relieved by analgesics or physiotherapy. We used 1 cc (40 mg) of methylprednisolone with 1 cc of 2% xylocaine for selective nerve root block. We assessed the pain using VAS score before and after the procedure and follow-up was done at 1, 3 and 6 months for pain relief evaluation.

Results: The mean age of our patients was 38.1 years ranging from 25 to 60 years. Majority were females (55%) and middle aged (40-50 years) (33.3%). Most of the cases were right sided (46.7%) and had L4-L5 herniation (34%), was postero-central on disc-axial section (46%) and had extrusion on sagittal section (50%). The pre-injection VAS score was 7.25 and immediate post injection VAS score decreased to 1.71. With further follow up at 1, 3 and 6 months, there was a moderately decreasing trend of VAS score.

Conclusions: SNRB is a reasonably safe procedure to provide short-term pain relief for lumbar radiculopathy in lumbar disc prolapse.

Keywords: selective nerve root block, lumbar radiculopathy, lumbar disc prolapse, radicular pain, pain relief, vas score

Introduction

Lumbar disc prolapses characterized by symptomatic disc herniation or typical sciatica is a major challenge for health care. Lumbar radiculopathy can be defined as pain from lower back radiating until the leg or further beyond along the course of a particular lumbar nerve. The incidence of lower back pain is estimated to be between 13% and 31% and the incidence of radicular symptoms in patients with low- back pain ranges from 12% to 40% [1,2]. One third of all patients with lumbar disc syndrome had been previously hospitalized with it and one fifth of the patients had undergone lumbar surgery.

Lumbar radiculopathy is radiating pain in the lower limbs through narrowed intervertebral foramen by a herniated intervertebral disc due to degenerative changes and thickening of the ligamentum flavum, zygapophyseal joint and surrounding soft tissues. In addition to mechanical compression, causes of radicular pain in degenerative lumbar spinal stenosis are difficult to explain by one theory. Suggested causes include inflammatory changes around nerve root, venous congestion and haematogenous disability.

In the management of radicular pain produced by spinal stenosis, injected steroid is expected to contribute to pain reduction by interrupting the synthesis of prostaglandins, blocking conduction of nociceptive c fibers and controlling edema around the nerve root. While early surgery in carefully selected patients with discogenic radiculopathy can achieve rapid relief, potential disadvantages of surgery include risks of infection, discitis, recurrence, nerve root injury and anesthetic complications could be avoided by epidural block [3].

Among the different techniques of intraspinal steroid injection such as transforaminal, interlaminar, and caudal epidural steroid injections, selective nerve root block (SNRB) is a highly target-oriented procedure with good efficacy in patients with Lumbar disc disease. The corticosteroid is injected directly near the dorsal root ganglion and the inflamed nerve root it is possible to inject toward the anterior extradural space of the nerve root related to symptoms

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[4, 5]. With this background, we conducted this cross-sectional study to know the efficacy of selective nerve root block (SNRB) in radicular symptoms of lumbar disc prolapse.

Methodology

A cross-sectional study was conducted in Basaveshwara Medical college and hospital, Chitradurga, Karnataka. We included 60 patients aged between 25-60 years of both gender with complaint of low backache with radiculopathy, unilateral, or bilateral, not relieved by analgesics or physiotherapy. The Lumbosacral radicular pain in our patients was with prolapsed intervertebral disc demonstrating positive SLRT. We excluded patients with claudication and with facet arthropathy, extruded disc seen on magnetic resonance imaging (MRI), patients with motor deficit, failed back syndrome. We also excluded patients with systemic diseases such as diabetes or any other source of infection.

Informed and written consent was taken from selected patients. Patients were evaluated with VAS and questionnaire (Rolando morris disability questionnaire score) related to the distribution and the degree of their symptoms before and after the procedure. Pre-interventional complete Neurological examination was done. Dynamic radiographs were taken to rule out any spinal instability.

We used 1 cc (40 mg) of methylprednisolone with 1 cc of 2% xylocaine for selective nerve root block. Patient was positioned prone on a radiolucent table, with C-arm fluoroscope on the side opposite to the affected limb. We identified the midpoint of the intervertebral space at the target level and adjusted the lower endplate of the target vertebral body to be aligned by moving the C -arm in a cephalocaudal direction.

Initial AP view: In AP view, we aligned the vertebral end plates, Spinous process in midline, which was done by cephalad tilt of the image intensifier.

End plate alignment: With the oblique of image intensifier, the pedicle of the corresponding vertebra was identified as the eye of the Scottish dog and by sub-pedicular approach, spinal nerve was approached. After local infiltration of xylocaine, a 23 G spinal needle was utilized to reach the transforaminal space. With the end-on view of the needle, 6'o clock position of the pedicle was reached. Ipsilateral tilt was done for scottish dog appearance. To visualize the foramina, we tilted the image intensifier obliquely by about 20 to 30 degrees. The pedicle of the corresponding vertebra was identified as the eye of the Scottish dog.

Lateral view: With the image intensifier in AP view, radio-opaque dye was injected. The dye used in our study was Iohexol. Equal volumes of dye and distilled water were used. After dye injection, if it is S-shaped, along the nerve root pathway, drug was administered. We followed-up patients 1, 3 and 6 months for pain relief evaluation.

Results

We included total of 60 patients with mean age of 38.1 years ranging from 25 to 60 years. Majority of our patients were females (55%) and middle aged (40-50 years) (33.3%). Most of the cases were right sided (46.7%) and had L4-L5 herniation (34%), was postero-central on disc-axial section (46%) and had extrusion on sagittal section (50%) (Table 1).

Table 1: Clinico-demographic variables in our study

Parameters	Frequency (%)	
Age	<30 years	8 (13.3%)
	31-40 years	18 (30%)
	41-50 years	20 (33.3%)
	>50 years	14 (23.4%)
Gender	Males	26 (45%)
	Females	34 (55%)
Laterality	Right	28 (46%)
	Left	22 (36.7%)
	Bilateral	10 (16.3%)
Disc level	L3-L4	7 (11%)
	L4-L5	20 (34%)
	L5-S1	9 (15%)
	L3-L4, L4-L5	7 (11%)
	L4-L5, L5-S1	17 (29%)
Axial section disc type	Postero lateral	20 (33%)
	Postero central	27 (46%)
	Foraminal	13 (21%)
Sagittal section disc type	Localised	8 (13%)
	Extrusion	30 (50%)
	Protrusion	22 (37%)
	Sequestration	-

Among 60 patients, pre-injection VAS score was 7.25. Immediate post injection VAS score significantly decreased to 1.71. With further follow up at 1, 3 and 6 months, there was a moderately decreasing trend of VAS score with patients (Table 2).

Table 2: VAS score pre-injection and post-injection follow-up

	VAS score
Pre-injection	7.25
Immediate post OP	1.7
1st month	2.3
3rd month	2.1
6th month	2.0

Discussion

Lumbar radiculopathy is a very common condition seen in our orthopaedic clinic. Selective steroidal nerve root block is a standard initial care of intervention in patients with recalcitrant radicular pain following LDH [6]. Absolute indications for acute surgery of prolapsed intervertebral discs are symptoms of a cauda equina syndrome, the presence of acute, severe motor deficit and intractable pain. No significant improvement after 2 months of conservative therapy is a relative indication for surgery. The prevalence of sciatic symptoms reported in the literature varies considerably ranging from 1.6% in the general population to 43% in a selected working population. Although the prognosis is good in most patients a substantial proportion (up to 30%) continues to have pain for 1 year or longer. In approximately 90% of the cases, sciatica is caused by a herniated disc involving nerve root compression.⁷ However, lumbar canal stenosis or foraminal stenosis and (less often) tumours or cysts are other possible causes. The therapeutic effect of local steroid infiltration is well recognized in the literature through several clinical studies and the success of pain relief is quoted up to 88% [8, 9].

We observed post-operative VAS score significantly decreased to 1.71 compared to 7.25 pre-operatively. There was decrease VAS score trend during every follow-up. Similar to our study, Rishi M kanna *et al.* [10] observed good

pain relief till 1 year (69 out of 91 patients, 75.8% efficacy), Lee *et al.* [7] reported that among 56 patients, 76.8% success achieved pain relief at the end of 2 weeks with SNRB. Arun-Kumar *et al.* [11] reported that among those graded mild had 4.3 months pain relief and that graded moderate had 2.5 months relief and severe disc prolapse had no pain relief except for the immediate post-procedural relief using SNRB. Tareq Kanaan *et al.* [12] observed that, 69 (90.7%) of the 76 patients improved immediately after the procedure, where VAS dropped from 10 to 3 directly. Similar results were also seen in a study conducted by Kim S-B *et al.* [13] in which the VAS dropped immediately from 7.8 to 2.9 after one SNRB. In the same study, a better treatment effect was observed for FS patients after a one-month and three-month period.

This made our primary objective on the clinical benefits of SNRB in treating patients with lumbosacral radiculopathy caused by lumbar disc prolapse to find out the percentage of long-term pain relief; therefore, SNRB can delay and sometimes cease the need for surgery.

Conclusion

The immediate response to Selective Nerve Root Block using steroid injection was satisfactory and has a considerable pain free life style over a short term of 6 months and its outcome for a long-term pain relief has to be further evaluated in coming days. We conclude that SNRB is a reasonably safe procedure to provide short-term pain relief for lumbar radiculopathy in lumbar disc prolapse.

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