

A prospective study in management of lumbar radiculopathy patients with selective nerve root block

Dr. Shah Shaival Kalpesh¹, Dr. Pradeep E^{2*}, Dr. Sathik Babu³, Dr. Arun Kumar KV², Dr. Thirumal⁴

¹Junior resident, ²Associate Professor, ³Professor and Head, ⁴Senior Resident, Department Of Orthopaedics, Chettinad Hospital And Research Institute

Corresponding Author: Dr. Pradeep E

Email: dr_prad87@yahoo.co.in



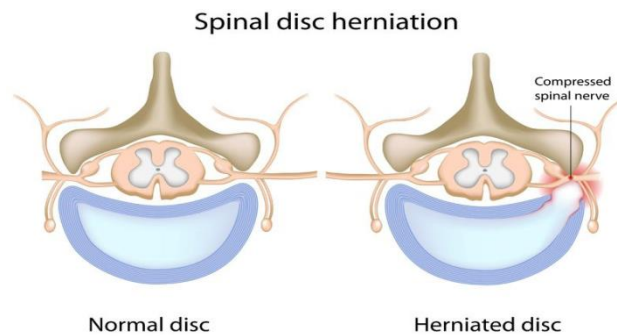
Abstract

Background: Prolapsed Intervertebral Disc (PID) was considered to be the commonest cause of sciatica among many others. Though the presentation of sciatica was paradoxical, in which, some people experienced sciatica without any disc prolapse on MRI/CT, whereas some people showed a prolapsed disc without experiencing any of the symptoms related to sciatica. This gave rise to different explanations that a disc prolapse in itself, is not enough to cause sciatica, and there might be some local chemical agents that might be the causative factor due to their insulting attitude on the nerve roots. **Objectives:** To study the functional outcome of patients with Posterior Lumbar Intervertebral disc prolapse (PLIVDP), Lumbar Canal Stenosis, and Lumbar radiculopathy after Selective Nerve Root Block at the corresponding level. **Materials and Methods:** A prospective cohort study on the functional outcome of patients with lumbar radiculopathy with Intervertebral disc prolapse or lumbar canal stenosis. Outcome measures used in this study are Oswestry disability index score and Numerical rating scale. All patients had taken an MRI scan, which was classified according to the Michigan state university classification. After initial check up, pre-anaesthetic check up, selected patients were given Selective Nerve Root Block with Methyl Prednisolone and local anaesthetic Bupivacaine. Patients were scored at Immediate post Op, 3 weeks and 3 months after the injection was given and the data was collected. **Results:** A total of 127 patients were given Selective Nerve Root Block in the study period. Patients that were aged from 20-80 years were included. Average pre-injection ODI scores (in percent) were 75.24, at 1 month 20.52 and at 4 months 19.86, with a *p* value of <0.001. Mean NRS ratings pre injection were 8.73, Immediate post op were 1.89, at 4 weeks it was 1.48 and 4 months 1.27. Mean SLR (in degrees) Pre Injection was 48.3, Immediate was 80.00, at 4 weeks was 80.2 and at 4 months was 80.5. **Conclusion:** Selective Nerve Root Block is a good therapeutic procedure for pain management in the patients with Lumbar radiculopathy, and it can be used as a standard procedure, before advising the patient for any form of surgery

Keywords: SNRB, Lumbar canal stenosis, Sciatica, Radiculopathy

Introduction

Pain of the lower back region is one of the most common complaints of a huge number of patients. Intervertebral Disc Prolapse is a major cause for these complaints. Chemical mediators that act locally may create inflammatory changes in the nerve roots. Phospholipase A₂ is found to be in large levels in the prolapsed disc material.^{1,2,3} An injection of corticosteroids can bring about a significant decrease in the inflammation of the nerve roots along with providing pain relief, with recurrence being the only minor disadvantage. Considering that surgical management isn't the most feasible option for all patients, a management trial with SNRB proves to be an effective option owing to its simple and cost-effective technique.⁴

Figure 1: Anatomy of normal disc with compression of spinal nerve**Aims & objectives**

1. Assessment of the effectiveness of Selective Nerve Root Block at the related level in patients with Intervertebral disc prolapse (IVDP), Lumbar Canal Stenosis and radiculopathy symptoms
2. To know duration of time, since the onset of symptoms of radiculopathy to the time of giving SNRB that will provide a satisfactory result.

Materials and methods

- **Type of study:** A prospective type of cohort study set inside the hospital
- **Duration:** 2 years from May 2018 to April 2020.
- **Study population:** Admitted patients that were diagnosed with back pain associated with Intervertebral Disc Prolapse and were aged more than 21 years have been added.
- **Sample size:** All patients that fulfilled the inclusion criteria have been included in the study
- **Follow up methods:** Clinical evaluation of the patients was carried out after 1 day, 1 month and 4 months since the time of giving SNRB with the help of Oswestry Disability index (ODI Score), Numeric Rating Scale, Straight Leg Raise Test (SLRT) parameters

Oswestry disability index (ODI) : A questionnaire meant to assess the results based on functional improvement with a maximum possible score of 50 that is 100%

0%-20% : Minimal disability

20%-40% : Moderate disability

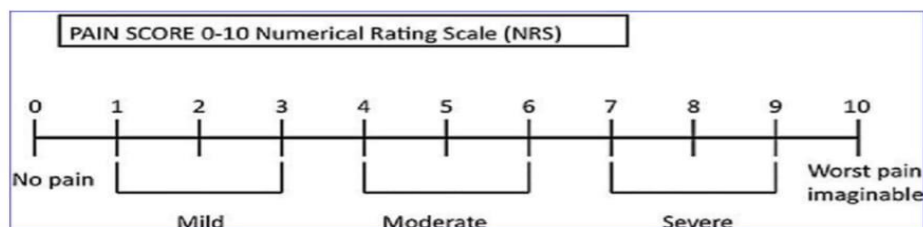
40%-60% : Severe disability

60%-80% : Crippled

80%-100% : Bed Bound

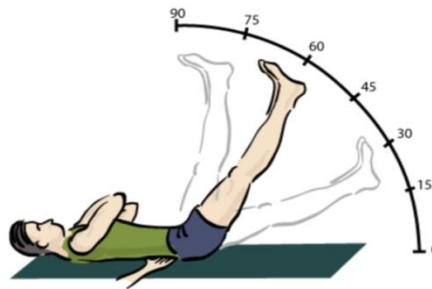
Numeric rating scale

A scale for pain grading that's assessed verbally, with 0 equating to no feeling of pain and 10 being the worst possible sensation of pain (Figure 2).

Figure 2: Numerical Pain Rating Scale

Straight leg raise test (laseague's test): Test for clinical examination to rule out disc herniation to be the reason for complaints of backache and radicular pain.

SLRT has been assessed at: 1. Before SNRB 2. Immediately after SNRB 3. After-SNRB at 1 month 4. After-SNRB at 4 Months.

Figure 3: SLR Test**Inclusion criteria**

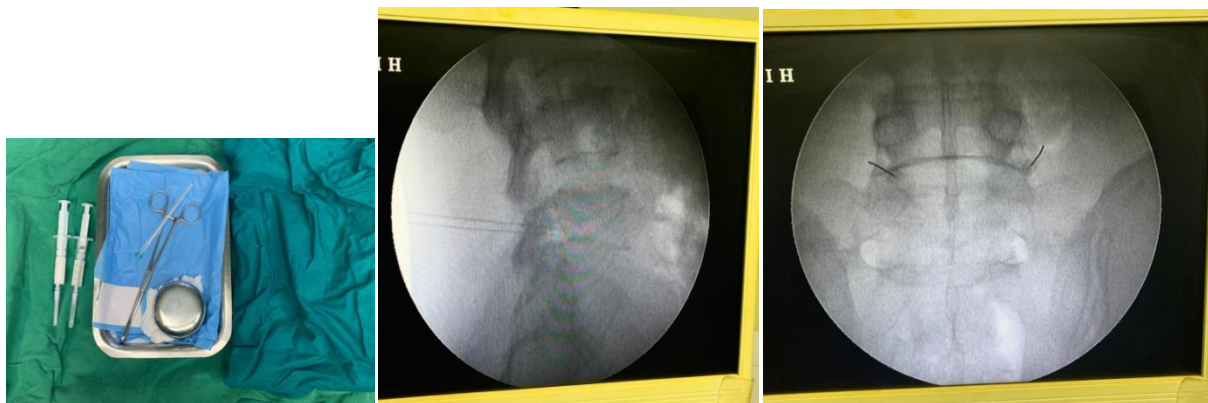
1. Patients having low back ache with radiating pain for a duration more than 2 months.
2. Patients with a positive Straight Leg Raising test (SLRT) in a range of 30 to 70 degrees
3. Patients suffering from Intervertebral Disc Prolapse (IVDP) and Stenosis of lumbar canal.

Exclusion criteria

1. Infective states
2. Instability of vertebral canal
3. Fractures due to underlying pathological conditions
4. Neurological deficits
5. Spinal defects at more than 1 level

Technique of SNRB

With the patient positioned prone on the operating table, back painted and draped in a strict anti-septic manner, an AP view of lumbar spine is obtained under C-arm guidance. The appropriate level is identified and the safe zone (inferior to the nerve root and inferior to the related pedicle) is marked. After providing local anaesthetic effect, with the help of an 18 G spine needle, passing in a cranio-medial direction, approximately 1 cc of Iohexol dye is injected and confirmed under C-arm guidance, followed by administration of 2 cc of drug Bupivacaine 0.25% and 1 ml of 40 mg of Triamcinolone.

Figure 4: Intra-operative C-arm images**Results**

Totally, 127 patients undertook management of SNRB in Chettinad Health & Research Institute during a time duration of 2 years i.e. May 2018 to April 2020. Out of 127 patients, 18 were found to be having Lumbar Canal Stenosis & 109 patients were found to be having Intervertebral Disc Prolapse.

Gender distribution: The study consisted of 68 males and 59 females in a total of 127 patients

Oswestry disability Index: Scoring was done before the procedure, at 1 month and at 4 months post the procedure. The mean scores are as follows:

Table 1: Mean ODI score at different time intervals

Review	Mean ODI score
Before procedure	75.24
At 1 month	20.52
At 4 months	19.86

Numeric rating scale (NRS): Scoring of pain was assessed with NRS before the procedure, 1 month and 4 months after the procedure.

Table 2: Mean Numeric Rating Scale at different time intervals

Review	Mean NRS
Before procedure	8.73
At 1 month	1.48
At 4 months	1.27

Straight leg raise test (laseague's test): Physical Examination was carried out just before the procedure, immediately after the procedure, at 1 month and at 4 months after the procedure.

Table 3: Mean SLR in degrees at different time intervals

Review	Mean SLR in degrees
Before Procedure	48.32
Immediately after the procedure	82.68
1 month	80.22
4 months	80.56

Discussion

Management of majority of the people with complaints of low back ache with radiating pain is usually conservative i.e., Rest, Physiotherapy, Medicines (NSAIDs, Pregabalin, Gabapentin), Short wave diathermy. Although, few patients who don't show any signs of improvement need further management. Owing to inflammatory mediators like Interleukins, Prostaglandins, TNF there occurs inflammatory changes of the nerve roots that cause pain even with minimal movements of the lumbo-sacral spine or by gentle pressure.⁵ It is extremely justified to believe that steroid agents produce a tremendous improvement without causing disturbances to other systems of the human body. SNRB is an extremely efficacious and risk free modality that can be used as a diagnostic tool as well as for therapeutic means in treatment of radiculopathy especially when other methods fail to reach to an acceptable diagnosis.⁶ The major drawback of epidural injections about the verification of accurate application and the need for intensifier guide is neutralized by SNRB since the targeted administration is always carried out under C-arm guidance and can be evidenced by the use of a contrast dye.⁷ The possible disadvantages under consideration can be recurrent and transient leg pain in 5-8 % of patients that may further require surgical management.⁸

Conclusion

It can be concluded that SNRB provides significant relief in patients of IVDP and that can be backed by both clinical as well as functional parameters. It's efficacy over a longer period of time can be debatable owing to a shorter period of follow up, but it's fair to suggest SNRB for management of pain in radiculopathy patients prior to any kind of surgical management.

References

1. Spijker-Huiges A, Groenhof F, Winters JC, van Wijhe M, Groenier KH, van der Meer K. Radiating low back pain in general practice: Incidence, prevalence, diagnosis, and long-term clinical course of illness. *Scand J Prim Health Care*. 2015 Mar;33(1):27–32.
2. Frymoyer JW. Lumbar disk disease: epidemiology. *Instr Course Lect*. 1992;41:217–23.
3. Microsoft Word - 12. sandeep ghuge 66 - 903-911.pdf.pdf [Internet]. [cited 2015 Sep 13]. Available from ijbamr.com/pdf/903-911.pdf.pdf
4. Stafford MA, Peng P, Hill DA. Sciatica: a review of history, epidemiology, pathogenesis, and the role of epidural steroid injection in management. *Br J Anaesth*. 2007 Oct;99(4):461–73.

5. Saal JS, Franson RC, Dobrow R, Saal JA, White AH, Goldthwaite N. High levels of inflammatory phospholipase A2 activity in lumbar disc herniations. *Spine*. 1990 Jul;15(7):674–8.
6. Young IA, Hyman GS, Packia-Raj LN, Cole AJ. The Use of Lumbar Epidural/Transforaminal Steroids for Managing Spinal Disease. *J Am Acad Orthop Surg*. 2007 Apr 1;15(4):228–38.
7. Mysliwiec LW, Cholewicki J, Winkelpleck MD, Eis GP. MSU Classification for herniated lumbar discs on MRI: toward developing objective criteria for surgical selection. *Eur Spine J*. 2010 Jul;19(7):1087–93.
8. Saal JA, Saal JS. Nonoperative treatment of herniated lumbar intervertebral disc with radiculopathy. An outcome study. *Spine*. 1989 Apr;14(4):431–7