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Effects Of Selective Nerve Root Block in Disc Induced Lumbago sciatica

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Abstract:

Background: *Lumbago refers to pain originating from the lower back, while sciatica describes radiating pain from the lower back to the lower limb due to nerve root involvement. Disc-induced lumbago-sciatica is commonly caused by mechanical compression and inflammatory irritation of the affected nerve root. Selective nerve root block (SNRB) using local anesthetic and corticosteroid reduces perineural inflammation and provides pain relief. This study evaluates the effectiveness of SNRB in patients with single-level unilateral lumbar disc herniation.*

Study Design : *Prospective interventional study.*

Study Duration : *June 2020 to May 2021.*

Setting :*Department of Orthopaedic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh and Bangladesh Spine & Orthopaedic Hospital, Dhaka, Bangladesh.*

Materials and Methods*: Eighteen patients with MRI-confirmed single-level unilateral lumbar disc herniation were included. Patients were treated with fluoroscopy-guided transforaminal SNRB. Outcomes were assessed using Visual Analogue Scale (VAS) for pain and Roland-Morris Disability Questionnaire (RMDQ) for functional disability at baseline, immediately after procedure, 2 weeks, 6 weeks, and 24 weeks.*

Results*: Among 18 patients, 10 (55.6%) were male and 8 (44.4%) were female. Mean age was 36 ± 7.93 years (range 22–50). Mean symptom duration was 7 months.*

VAS improved from 6.56 ± 1.19 at baseline to 3.28 ± 0.95 immediately after injection, 3.44 ± 1.20 at 2 weeks, 3.44 ± 1.20 at 6 weeks, and 4.11 ± 1.20 at 24 weeks. Significant improvement was observed at 2 weeks ($p = 0.048$) and 6 weeks ($p = 0.020$), while changes at immediate post-procedure ($p = 0.052$) and 24 weeks ($p = 0.060$) were not statistically significant.

RMDQ improved from 16.33 ± 1.08 at baseline to 7.89 ± 1.60 immediately after procedure, 8.78 ± 1.50 at 2 weeks, 8.94 ± 1.80 at 6 weeks, and 9.35 ± 2.40 at 24 weeks. Significant improvement was observed up to 6 weeks ($p < 0.05$), but not at 24 weeks ($p = 0.247$).

Recurrence of symptoms occurred in 5 patients (27.8%), and 3 patients (16.7%) required surgery. No major neurological complications were observed.

Conclusion: *Selective nerve root block is a safe and effective minimally invasive intervention that provides significant short-term pain relief and functional improvement in patients with disc-induced lumbago-sciatica.*

However, symptom recurrence is common, and the long-term benefits appear limited.It does not alter disease progression in patients with severe pathology requiring surgery.

***Key Word**: Lumbago, Sciatica, Selective Nerve Root Block, Lumbar Disc Herniation, VAS, RMDQ*

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I. Introduction

Low back pain associated with radicular leg pain is a common clinical condition worldwide and represents a significant cause of disability and healthcare utilization. Although many patients experience spontaneous improvement, a substantial proportion develop persistent or recurrent symptoms secondary to lumbar disc herniation (1).

Lumbosacral radicular pain has an estimated prevalence of 9.9%–25% in the general population and is characterized by pain radiating along a dermatomal distribution, often accompanied by sensory disturbances, motor weakness, or reflex changes (1). The pathophysiology of lumbar radiculopathy involves both mechanical compression of the affected nerve root and biochemical inflammation caused by the release of inflammatory mediators from degenerated intervertebral disc material (1,3).

Initial management of disc-induced lumbago-sciatica typically includes conservative measures such as nonsteroidal anti-inflammatory drugs (NSAIDs), physiotherapy, activity modification, muscle relaxants, and neuropathic pain medications (4). However, a considerable number of patients continue to experience disabling symptoms despite adequate conservative treatment. In such cases, interventional pain management techniques, including epidural steroid injections and selective nerve root block (SNRB), may be considered as alternatives to surgical intervention (2,4,5).

Selective nerve root block is a minimally invasive procedure in which a local anesthetic and corticosteroid are delivered directly around the affected nerve root under fluoroscopic guidance. The procedure provides both diagnostic and therapeutic benefits by reducing perineural inflammation and interrupting nociceptive pain transmission (5,6). Previous studies have demonstrated favorable short-term outcomes following SNRB, with significant reductions in pain intensity and improvements in functional status among patients with lumbar radiculopathy (6,7,10).

Despite its widespread use, the long-term effectiveness of SNRB remains controversial, and recurrence of symptoms is frequently reported. Furthermore, the role of SNRB in preventing or delaying surgical intervention continues to be debated (7,11). Therefore, the present study was conducted to evaluate the clinical effectiveness of selective nerve root block in patients with disc-induced lumbago-sciatica and to assess its impact on pain relief, functional outcome, symptom recurrence, and the subsequent need for surgery.

II. Material And Methods

Study Design & Setting: This prospective interventional study was conducted at Dhaka Medical College Hospital and Bangladesh Spine & Orthopaedic Hospital from June 2020 to May 2021.

Study Population: Eighteen patients with MRI-confirmed single-level unilateral lumbar disc herniation were included.

Inclusion criteria:

1. Age 18–50 years
2. Unilateral radicular pain
3. MRI-confirmed single-level disc herniation
4. Failure of conservative treatment ≥6 weeks

Exclusion criteria:

1. Multilevel disc disease
2. Bilateral radiculopathy
3. Previous lumbar surgery
4. Recent steroid injection (<3 months)

5. Pregnancy
6. Uncontrolled diabetes or systemic disease
7. Spinal fracture or congenital anomalies

Procedure methodology

SNRB was performed under fluoroscopic guidance in prone position. After local anesthesia, a 22G spinal needle was advanced to the target nerve root via transforaminal approach. Correct placement was confirmed using contrast dye.

Injection mixture:

- 2% lidocaine
- 40 mg methylprednisolone acetate

Outcome Measures:

- Pain: Visual Analogue Scale (VAS)
- Disability: Roland-Morris Disability Questionnaire (RMDQ)
- Follow-up: baseline, immediate, 2, 6, and 24 weeks

Statistical analysis:

Data was analyzed using the Statistical Package for Social Sciences SPSS version 20 (SPSS Inc., Chicago, IL). Continuous variables were expressed as mean ± standard deviation (SD). Paired comparisons between baseline and follow-up measurements were performed. A p-value of <0.05 was considered statistically significant.

III. Result

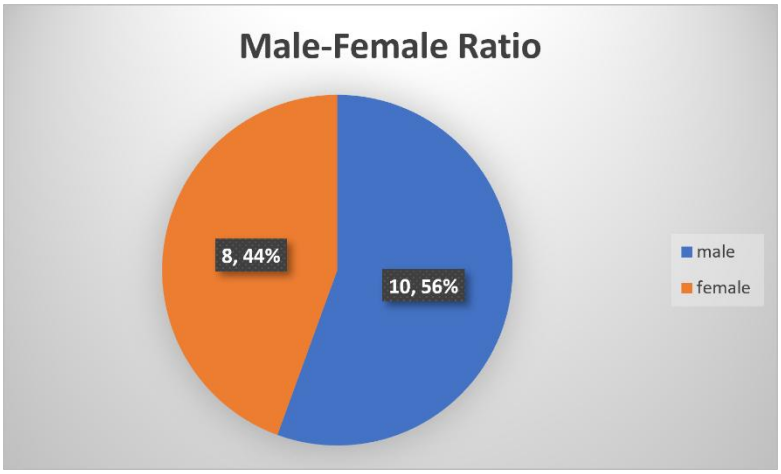
Demographic Characteristics

A total of 18 patients with MRI-confirmed single-level unilateral lumbar disc herniation were included in the study. Among them, 10 (55.6%) were male and 8 (44.4%) were female. The mean age of the patients was 36.0 ± 7.93 years, with an age range of 22–50 years. The mean duration of symptoms before intervention was 7 months (Table 1).

Table no 1: Demographic Characteristics of the Study Population

Variable	Value
Total patients	18
Male	10 (55.6%)
Female	8 (44.4%)
Mean age (years)	36.0 ± 7.93
Age range (years)	22–50

Mean symptom duration (months)	7

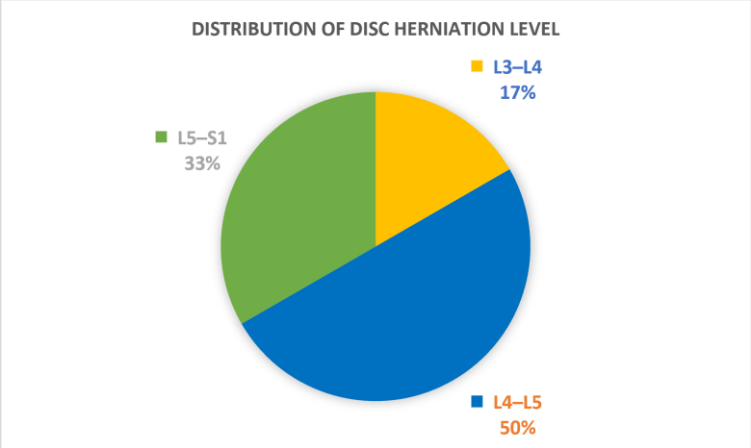


Distribution of Disc Herniation Level

The most commonly affected level was L4–L5, observed in 9 patients (50.0%), followed by L5–S1 in 6 patients (33.3%) and L3–L4 in 3 patients (16.7%) (Table 2).

Table no 2: Distribution of Disc Herniation Level

Level	Number (%)
L3–L4	3 (16.7%)
L4–L5	9 (50.0%)
L5–S1	6 (33.3%)
Total	18 (100%)



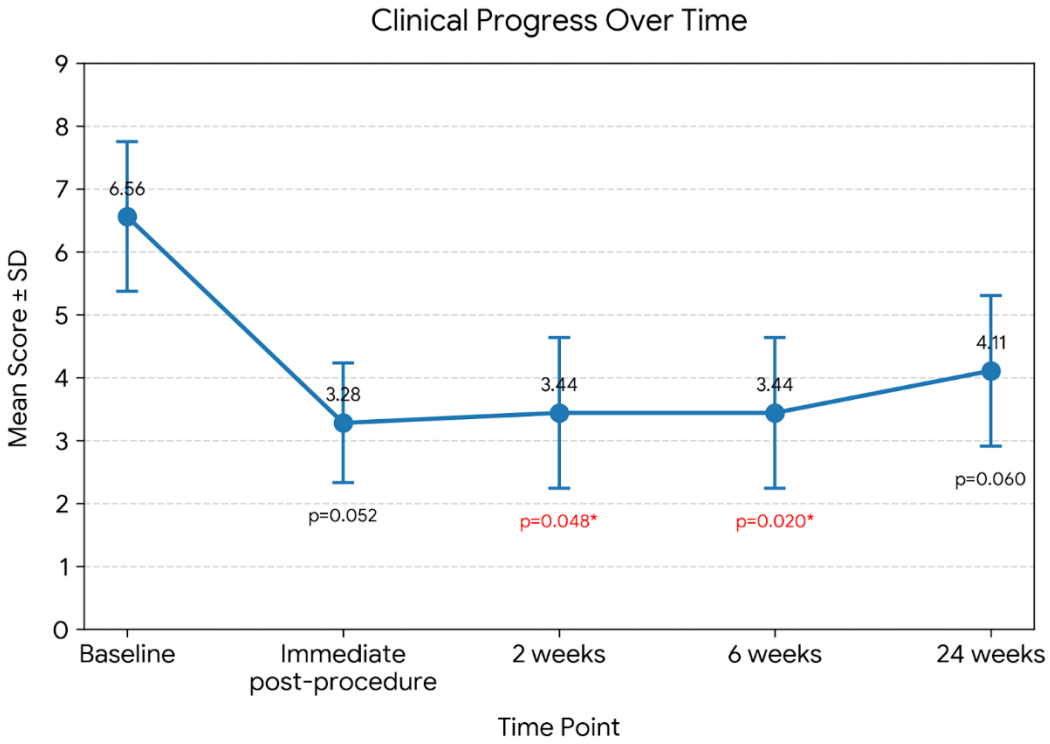
Pain Outcome (VAS)

The mean baseline Visual Analogue Scale (VAS) score was 6.56 ± 1.19. Following selective nerve root block, the mean VAS score decreased to 3.28 ± 0.95 immediately after the procedure, 3.44 ± 1.20 at 2 weeks, 3.44 ± 1.20 at 6 weeks, and 4.11 ± 1.20 at 24 weeks. Statistically significant improvement in pain was observed at 2 weeks ($p = 0.048$) and 6 weeks ($p = 0.020$). Although pain scores remained lower than baseline at 24 weeks, the difference was not statistically significant ($p = 0.060$), suggesting partial recurrence of symptoms over time (Table 3).

Table no 3: VAS Score During Follow-up

Time	Mean ± SD	p-value
Baseline	6.56 ± 1.19	—
Immediate post-procedure	3.28 ± 0.95	0.052
2 weeks	3.44 ± 1.20	0.048*
6 weeks	3.44 ± 1.20	0.020*
24 weeks	4.11 ± 1.20	0.060

***Statistically significant ($p < 0.05$)**



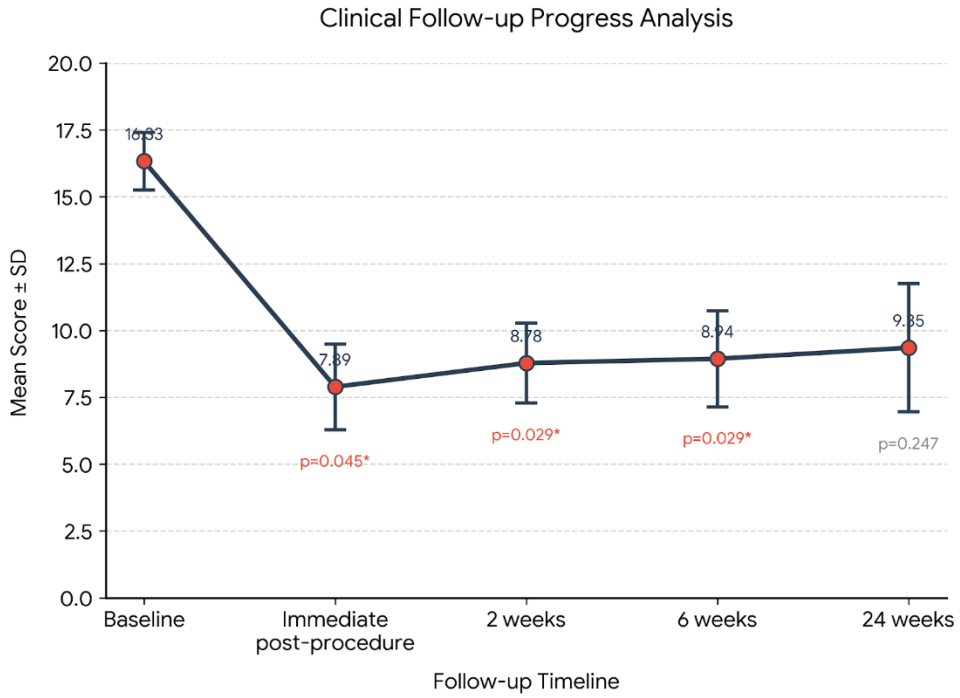
Functional Outcome (RMDQ)

The mean baseline Roland-Morris Disability Questionnaire (RMDQ) score was 16.33 ± 1.08. Following intervention, the mean RMDQ score improved to 7.89 ± 1.60 immediately after the procedure, 8.78 ± 1.50 at 2 weeks, 8.94 ± 1.80 at 6 weeks, and 9.35 ± 2.40 at 24 weeks. Significant improvement in functional disability was observed immediately after the procedure and persisted up to 6 weeks ($p < 0.05$). However, the improvement was no longer statistically significant at 24 weeks ($p = 0.247$) (Table 4).

Table no 4: VAS Score During Follow-up

Time	Mean ± SD	p-value
Baseline	16.33 ± 1.08	—
Immediate post-procedure	7.89 ± 1.60	0.045*
2 weeks	8.78 ± 1.50	0.029*
6 weeks	8.94 ± 1.80	0.029*
24 weeks	9.35 ± 2.40	0.247

***Statistically significant ($p < 0.05$)**



Clinical Outcome

During the follow-up period, recurrence of symptoms was observed in 5 patients (27.8%). Three patients (16.7%) subsequently required surgical intervention because of persistent or recurrent symptoms. No major neurological complications or procedure-related adverse events were recorded during the study period.

Overall, selective nerve root block produced significant short-term improvement in pain and functional disability. The greatest clinical benefit was observed within the first six weeks following the procedure. Although some deterioration in outcomes was noted at 24 weeks, both VAS and RMDQ scores remained improved compared with baseline values. Recurrence occurred in 27.8% of patients, while 16.7% ultimately required surgical intervention.

IV. Discussion

The present study evaluated the effectiveness of fluoroscopy-guided selective nerve root block (SNRB) in patients with disc-induced lumbago-sciatica. The findings demonstrated significant short-term improvement in both pain intensity and functional disability following the procedure. Improvement was most evident during the first six weeks after injection, supporting the role of SNRB as an effective minimally invasive treatment option for lumbar radiculopathy.

The reduction in VAS scores observed in this study is consistent with previous reports demonstrating the efficacy of transforaminal epidural steroid administration in reducing radicular pain through suppression of inflammatory mediators around the affected nerve root. Vad et al. reported significant pain reduction and functional recovery following transforaminal steroid injection in patients with lumbar radiculopathy (6). Similarly, Manchikanti et al. demonstrated favorable short-term outcomes following lumbar transforaminal epidural steroid injections (5).

Functional improvement measured by the Roland-Morris Disability Questionnaire also showed significant improvement up to six weeks after treatment. These findings are comparable to those reported by Kanaan et al., who observed meaningful symptom relief and reduced need for surgery after therapeutic selective nerve root block (7). Arun-Kumar et al. likewise reported substantial clinical improvement among patients with lumbar disc-related radiculopathy treated with SNRB (10).

Despite the initial improvement, recurrence of symptoms was observed in 27.8% of patients, and 16.7% ultimately required surgical intervention. This finding suggests that while SNRB effectively controls inflammation and alleviates symptoms, it does not address the underlying structural pathology responsible for nerve root

compression. Similar observations have been reported by Lavelle et al., who found that a proportion of patients eventually proceeded to lumbar discectomy despite initial symptomatic improvement following nerve root injections (11).

No major neurological complications occurred in the present study. This supports previous evidence indicating that fluoroscopy-guided SNRB is a relatively safe procedure when performed by experienced clinicians using appropriate imaging guidance (9).

Overall, SNRB appears to be a valuable treatment option for short-term pain relief and functional improvement in selected patients with disc-induced lumbago-sciatica. It may also serve as a useful bridge between conservative treatment and surgery, particularly in patients wishing to delay operative intervention.

V. Limitations

This study has several limitations. First, the sample size was relatively small, which may have limited the statistical power and generalizability of the findings. Second, the absence of a control group precluded direct comparison between selective nerve root block and other treatment modalities. Third, the follow-up period was limited to 24 weeks, preventing assessment of long-term clinical outcomes and recurrence rates. Fourth, the study included only patients with single-level unilateral lumbar disc herniation; therefore, the findings may not be applicable to patients with multilevel disease or more complex spinal pathology. Finally, the study was conducted at a limited number of centers, which may have introduced selection bias.

Future studies with larger sample sizes, randomized controlled designs, and longer follow-up periods are recommended to better define the long-term efficacy and prognostic value of selective nerve root block in lumbar radiculopathy.

VI. Conclusion

Selective nerve root block (SNRB) is a safe and effective minimally invasive intervention for the management of disc-induced lumbago-sciatica. It provides significant short-term reduction in pain and improvement in functional disability, particularly during the first six weeks following treatment. However, the therapeutic benefits tend to diminish over time, and symptom recurrence is not uncommon. Although SNRB may delay or reduce the need for surgical intervention in selected patients, a proportion of patients with persistent or recurrent symptoms ultimately require surgery. Therefore, SNRB should be considered an effective adjunct to conservative management and a useful intermediate treatment option before surgery, rather than a definitive treatment for all patients with lumbar disc herniation.

VII. Ethical Approval

Ethical approval was obtained from the Institutional Review Board before commencement of the study. Written informed consent was obtained from all participants.

VIII. Funding

No external funding was received for this study.

IX. Conflict of Interest

The authors declare no conflict of interest.

X. Author Contributions

Jhuton Chandra Banik, Assistant Professor, Department of Orthopaedic Surgery, Government Employee Hospital, Bangladesh contributed to study conception, study design, patient recruitment, data collection, statistical analysis, manuscript preparation, revision, and final approval of the manuscript.

References

[1]. 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;99(4):461–473.
[2]. Ackerman WE, Ahmad M. The efficacy of lumbar epidural steroid injections in patients with lumbar disc herniations. Anesth Analg. 2007;104(5):1217–1222.
[3]. Jusko WJ. Pharmacokinetics and receptor-mediated pharmacodynamics of corticosteroids. Toxicology. 1995;102(1–2):189–196.
[4]. Staal JB, De Bie RA, De Vet HC, Hildebrandt J, Nelemans P. Injection therapy for subacute and chronic low back pain. Spine. 2009;34(1):49–59.

[5]. Manchikanti L, Buenaventura RM, Manchikanti KN, Ruan X, Gupta S, et al. Effectiveness of therapeutic lumbar transforaminal epidural steroid injections. Pain Physician. 2012;15: E199–E245.
[6]. Vad VB, Bhat AL, Lutz GE, Cammisa F. Transforaminal epidural steroid injections in lumbosacral radiculopathy. Spine. 2002;27(1):11–16.
[7]. Kanaan T, Abusaleh R, Abuasbeh J, Al Jammal M, Al-Haded S, et al. The efficacy of therapeutic selective nerve root block in treating lumbar radiculopathy and avoiding surgery. J Pain Res. 2020; 13:2971–2978.
[8]. Thackeray A, Fritz JM, Brennan GP, Zaman FM, Willick SE. Physical therapy as an adjunct to selective nerve root block. Phys Ther. 2010;90(12):1717–1729.
[9]. Meyers JS, Yang ST, Anghel BN. Side effects and complications of fluoroscopically guided nerve root injections. Arch Phys Med Rehabil. 1996; 77:937.
[10]. Arun-Kumar K, Jayaprasad S, Senthil K, Lohith H, Jayaprakash KV. Outcomes of selective nerve root block for disc-induced lumbar radiculopathy. Malays Orthop J. 2015;9(3):17–21.
[11]. Lavelle WF, Mroz T, Lieberman I. The incidence of lumbar discectomy after epidural steroid injections or selective nerve root blocks. Int J Spine Surg. 2015;9.