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Therapeutic and diagnostic efficacy of root block procedure in lumbosacral radiculopathy: A study of 75 cases

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Abstract

Background: Back pain and leg pain are one of the most common symptoms in day to day orthopaedic clinical practice. Also, there is rise in incidence of discogenic back ache because of changed lifestyle, abnormal posture of sitting and lying, continuous sitting in vehicles, and inadequate physical activities. Selective nerve root blockings having the diagnostic and therapeutic use, which is popular and possess certain advantages in avoiding uncertain potential of surgical complications.

Aim: To evaluate diagnostic and therapeutic efficacy of selective nerve root block procedure. To study relief in terms of pain alleviation, decrease in disability and straight leg raising (SLR) restriction.

Materials and Method: It is a Prospective study of 75 patients of sciatic radiculopathy between the ages of 20 and 60 years are assessed under study that satisfied the inclusion criteria, received selective nerve blocks. Patients were assessed for pain relief and disability reduction.

Results: Total of 75 patients were included in study with 55 males and 20 females with male to female ratio of approx 2:1. The VAS and ODI scores were evaluated in the patients received the nerve block. There was significant immediate improvement in the VAS score and reduction in ODI score at 1st week, 1 month and 6 month of follow-up period in patients.

Conclusion: SNRB is a important and most effective less expensive and minimal invasive treatment modality to provide relief to patients with pain and long lasting therapeutic benefits. This allows the patients to resume the physical activity or work.

Keywords: Selective nerve root block (SNRB), low back pain, lumbar radiculopathy, sciatica, diagnosis

1. Introduction

Back pain and leg pain are one of the most common symptoms in day to day orthopaedic clinical practice. Of these, quite number of population have prolapsed inter-vertebral disc which might be the cause of the impingement on nerve root leading to radicular pain. Also, there is rise in incidence of discogenic back ache because of changed lifestyle, abnormal posture of sitting and lying, continuous sitting in vehicles, and inadequate physical activities. in western countries back pain is considered to be the leading cause of disability ^[1].

According to various studies and literatures, it is proved that prolapsed inter-vertebral disc is more common at the level of L4 - L5, L5 - S1; this implies the need of special importance to lumbo-sacral radiculopathy.

With the wide availability of MRI, clinical diagnosis and confirmation by MRI scan has been made easy. Many a times a disc lesion in MRI may influence the surgeon to operate and remove the offending disc. However, many such patients may not actually need surgery and can be treated non-operatively. There are several modes of non-operative methods including epidural steroid and selective nerve root block. This study aims to study the functional efficacy of root block in patients with lumbo-sacral radiculopathy and the improvement in outcome.

Selective nerve root block is used to detect specific source of nerve root pain and also for therapeutic relief when nerve root is compressed and inflamed, it produces back with or without leg pain. Epidural injections have a long history of efficacy and safety in treating low back pain and lower extremity pain since 1901^[2].

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In SNRB, Nerve root is advanced at level where it exists foramen; injection is done with mixture of steroid and local anaesthetic agent. c- Arm fluoroscopic guidance with contrast dye injection is used to ensure that drug is delivered to correct site of injection. If leg +/- back pain goes away after injection, it is concluded that pain generator is that specific root for which drug is injected.

2. Aims and Objective

To evaluate diagnostic and therapeutic efficacy of selective nerve root block procedure. To study relief in terms of pain alleviation, decrease in disability and straight leg raising (SLR) restriction

3. Material and Method

It is a Prospective study of seventy five patients of sciatic radiculopathy between the ages of 20 and 60 years are assessed under study at Goa Medical College and Hospital, Goa. All the patients of different ages and sex had radicular pain with or without back pain, restricted spinal mobility, positive active and passive SLR Test and other nerve tension signs.

"Patients who were prearranged for root block injections were informed about the pain management and goals and only after a written consent, invasive procedure was carried out. Platelet inhibitors like clopidogrel, aspirin were stopped a week prior to surgery, systemic infections were ruled out before injecting steroid. Our study comprised of administering only one dose of steroid injection at the level root, pre determined by MRI finding, with C-Arm fluoroscopy guidance."

"The self assessment questionnaire included a visual analogue scale of 0 to 10 for assessment of current back and radicular pain. Pain drawing was used to indicate the magnitude of pain and an Oswestry disability index was used to quantitate the level of function (on a 0 to 100 point scale, in which higher score represents greater disability)^[3]. The questionnaire and clinical examination was completed at presentation and at follow up visits of one week, one month and 6 months." Inclusions: patient aged 20 - 60 years; Patients with low back ache with unilateral or bilateral leg pain, not relieved by analgesics or physiotherapy, Lumbo-sacral radicular pain as a result of disc prolapse, Positive SLRT, Acute patients preferred to chronic patients. Exclusions: patients aged > 60yrs, Extruded disc on MRI, Patients with motor deficit, Failed back syndrome, Patients with claudication and facetal arthropathy, Diabetes or infection. Statistics: collected data were represented as mean, standard deviation and frequency distribution. The mean difference was assessed using the appropriate statistical method. The p-value of <.05 was considered statistically significant.

4. Results

Out of 75 patients, 55 male patients and 20 female patients of age group between 20 and 60yrs are examined before giving injection and serial follow ups at 1 week, 1 month and 6 months timing was done. (Table 1-3)

Table 1	: Demog	raphic detai	ls of the	patients	included	in prese	nt study.
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	Frequency	Percent				
Gender						
Male	55	73				
Female	20	27				
Age Group						
20-30 yrs	15	20				
30-40 yrs	32	42				
40-50 yrs	20	27				
50-60 yrs	8	11				
Level of Disc						
L2-L3	1	1				
L3-L4	4	5				
L4-L5	40	54				
L5-S1	30	40				

Table 2: Findings of visual analog scale (VAS), Oswestry disability index (ODI) and straight leg raising test (SLRT)

	Excellent	Good	Fair	Poor
VAS (Decrease in pain scale)	4 or more points	3 points	1 or 2 points	0 points
ODI (Decrease in % of disability)	≥30%	15-30%	5-15%	<5%
SLRT	0	1	2	3

Table 3: Improvement post-surgery.

	No of patients	Percent
Excellent	49	65.3
Good	15	20
Fair	8	10
Poor	3	4



Fig 1: Improvement in patients post-surgery

Table 4: Mean values of the VAS and ODI evaluation in patients.

	Before injection (a)	1 st week (b)	1 month (c)	6 month (d)	Sig
VAS	5.75 ± 0.96 *b,c,d	1.92 ± 0.96	1.96 ± 1.35 *d	1.91 ± 1.34	< 0.001
ODI	53.49 ± 8.06 *b,c,d	24.51 ± 8.15 *d	24.43 ± 8.24 *d	23.71 ± 8.41	< 0.001
SLRT	$1.67 \pm 0.72 \ \text{*b,c,d}$	0.6 ± 0.8	0.52 ± 0.84	0.52 ± 0.8	< 0.001

p-value <.05 considered statistically significant. VAS - Visual analog scale; ODI - Oswestry disability score; SLRT - straight leg raising test.

Table 4 showing the significant improvement in VAS scoring in after injection is given to patients at the interval of 1^{st} week, 1^{st} month and 6^{th} month to the patient. Likewise reduction in the ODI score can be observed in the patients. These findings were statistically significant. On comparison of the mean values of visual analog scale before injection and visual analog scale 1 week the mean values of visual analog scale before injection is higher with a difference of 3.827 is statistically significant with a p value of <0.001 in all the patients.

5. Discussion

Nerve root block technique was first described to diagnose sources of radicular pain when imaging studies suggested possible compression of nerve roots. Early studies which used extra-foraminal injection of steroid relied upon provocation of leg pain resulting from penetration of nerve by needle.

Frequently it is not possible to exactly localise compromised nerve root either by clinical and neurological examination or by imaging studies. SNRB allows diagnosis of affected nerve root with sensitivity of 100 % in cases of prolapsed intervertebral disc and with positive predictive value of 75 - 95 % in cases of foramina stenosis

Although improvement may not be equal in all patients, 49 (65%) patients enjoyed excellent relief, 15 (20%) patients had good relief, 8 (10.7%) patients had fair relief. The present study findings are in correlation with the previous studies to evaluate the therapeutic and diagnostic utility of SNRB in lower back ache ^[4-7].

Weiner and Fraser investigated success of nerve root blocks and found considerable pain relief in patients with radicular pain. "Weber conducted in study that main drawback of non operative treatment is slow recovery and patients are disabled for prolonged period of time" ^[8].

6. Conclusion

Study involving 75 patients with lumbo-sacral radiculopathy,

root block procedure has proved to be a useful procedure in alleviating pain and provides significant improvement in activities of daily life and also a reliable diagnostic method to find the specific nerve root as a source of pain generator in lumbo-sacral radiculopathy.

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8. Conflict of interest: There are no conflicts of interest.

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