

Comparison of Suprascapular Nerve Block (A Novel Technique) and a Combination of Suprascapular Nerve Block Plus Intra-articular Injection in Chronic Shoulder Pain

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ABSTRACT

Background: Both suprascapular nerve block (SSNB) and intra-articular injection are effective methods for the treatment of chronic shoulder pain. Recently, intra-articular steroid injection (IAI) and SSNB have become popular.

Aims and objectives: To assess and compare the relative effectiveness of a novel technique of SSNB and combined SSNB and IAI steroid on relief of chronic shoulder pain.

Materials and methods: A total of 40 patients were randomized to the two groups. Group A received SSNB by our novel technique, and group B received combined SSNB and IAI. Visual analog scale (VAS) for pain and shoulder pain disability index (SPADI) were assessed before giving the blocks and IAI and at both the follow-up visits, i.e. at 1 and 4 weeks.

Result: Significant improvements were seen in all pain scores and disability in the shoulders in both the groups. Improvements in pain and disability scores were clinically and statistically significant.

Conclusion: Combined IAI and SSNB were found to be better than SSNB alone.

Keywords: Intra-articular injection, Shoulder pain, Suprascapular nerve block.

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INTRODUCTION

Shoulder pain has a prevalence of 15 to 30% in the adult population. It is a common complaint especially amongst the elderly and may lead to functional disability and¹ decrease in quality of life. Shoulder pain is a common cause of morbidity in the community and most common causes of pain include degenerative diseases affecting the glenohumeral and acromioclavicular joints and supporting soft-tissue structures in addition to inflammatory diseases, such as rheumatoid arthritis (RA), seronegative spondyloarthropathies and crystal arthropathies.²

Both suprascapular nerve block (SSNB) and intra-articular injection are effective methods for the treatment of chronic shoulder pain. However, SSNB has been associated with complications of pneumothorax which has been a huge drawback in the popularity of this technique.³

In our study, thus, we have used a novel technique of SSNB, which virtually eliminates the chances of pneumothorax.⁴ In this prospective study, we have compared the effectiveness of this novel technique of SSNB with a combination of this technique and intra-articular steroid injection (IAI) in chronic shoulder pain.

AIMS AND OBJECTIVES

To assess and compare the relative effectiveness of the novel technique of SSNB and combined SSNB and IAI on relief of chronic shoulder pain.

MATERIALS AND METHODS

After getting institutional Ethics Committee approval, the present study was conducted as a prospective observational study in Netaji Subhash Chandra Bose Medical College, Jabalpur, from a time period of May 2015 to December 2015. The patients who satisfied inclusion criteria were recruited for the study after informed consent. The inclusion criteria were defined as following:

- Pain and stiffness in one or both the shoulders for at least 4 weeks
- Restricted and passive range of motion at the glenohumeral joint
- Pain at night causing sleep disturbance and inability to lie on the affected side

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Fig. 1: Landmarks for IAI (medial border of head of humerus and lateral part of clavicle)

- No history of recent trauma
- No previous injection in the involved shoulder
- No history of allergy to local anesthetics
- No medical condition, such as coagulation disorders.

Patients who refused the informed consent and patients with chronic shoulder pain (Fig. 1) due to other causes like nerve damage or neurologic disorders and patients with irregular follow-up were excluded from the study.

Under all aseptic precautions, all the patients were administered SSNB by the novel technique in group A. In this technique, the superior surface of the spine of scapula was marked (Figs 2A and B). Scapular spine was palpated from medial to lateral to a point where the spine becomes broad. The needle was inserted parallel to the skin hitting the superior surface of the spine of scapula as close as possible to the posterior surface of wing of scapula. Then the needle was walked of laterally remaining in close proximity to the bone, as soon the needle gave way it implied the needle was in supraglenoid notch (SGN). With proper aspiration, a total volume of 5 ml local

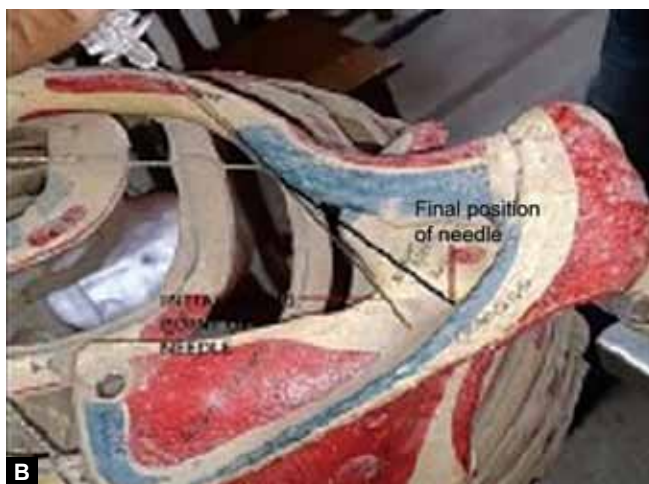
lignocaine 1% + depomedrol 40 mg was injected to both the suprascapular nerve (SSN) in suprascapular fossa. Throughout the procedure, care was taken to maintain the direction of needle parallel to the surface of the skin (Fig. 3). Group B received SSNB as in group A along with IAI. For IAI, 1% lidocaine 5 ml + depomedrol 40 mg was used and given by the anterior approaching a 23 G hypodermic needle. In anterior approach, the needle was placed medial to the head of humerus and 1 cm lateral to the coracoid process. The needle was directed posteriorly and slightly superiorly and laterally. If the needle hit against bone, it was pulled back and redirected at different angle.

For the combined treatment, IAI was done immediately after SSNB. The patients were followed up in two visits after SSNB at the end of the 1st week after injection and at the end of 4th week after injection.

Visual analog scale (VAS) for pain and shoulder pain disability index (SPADI) were assessed before giving the blocks and IAI and at both the follow-up visits. The patients were asked to answer a questionnaire in their native language. Patients were also asked to rate their pain



Fig. 3: Anterior approach of IAI



Figs 2A and B: (A) Suprascapular nerve block and (B) the direction of the needle

relief on a 5-point standard likert scale as 0: no pain relief, 1: a little pain relief, 2: moderate pain relief, 3: a lot of pain relief, and 4: complete pain relief. The results were analyzed using repeated measures analysis of variance using a Statistical Package for the Social Sciences 16 software.

RESULTS

A total of 40 patients were randomized to the two groups. Group A received suprascapular block by our novel technique, and group B received combined SSNB and IAI. The groups were analyzed, 30 of them were males (75%), and the remaining 10 were females (25%). The mean age of the patients was 43.45 and 46.70 years in groups A and B respectively.

The baseline VAS scores, SPADI pain score, SPADI disability pain scores and pain relief on likert scale were noted and found to improve after 1 and 4 weeks.

Table 1: Visual analog scale distribution both the groups

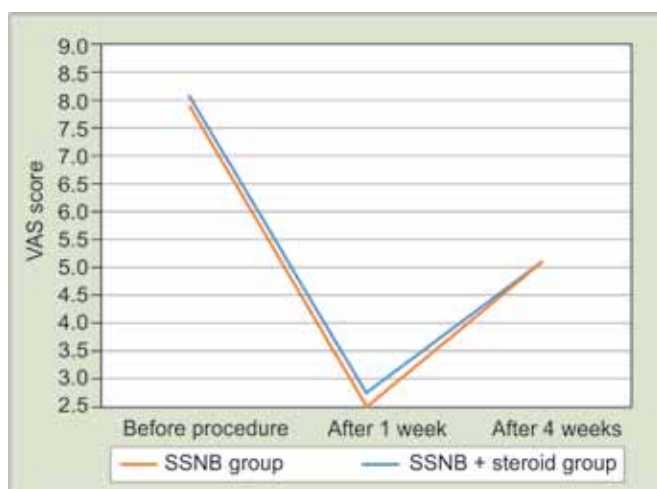
	SSNB group (mean ± SD)	SSNB + steroid group (mean ± SD)	p-value
Before procedure	8.10 ± 2.10	7.90 ± 2.04	000
After 1 week	2.75 ± 1.020	2.50 ± 0.761	0.022
After 4 weeks	5.10 ± 1.51	5.10 ± 1.51	0.004

Table 2: Likert scale distribution

	SSNB group (mean ± SD)	SSNB + steroid group (mean ± SD)	p-value
After 1 week	2.75 ± 1.020	2.50 ± 0.61	0.022
After 4 weeks	4.10 ± 1.11	3.50 ± 1.05	0.017

Table 3: Shoulder pain disability index pain distribution

	SSNB group (mean ± SD)	SSNB + steroid group (mean ± SD)	p-value
Before block	72.80 ± 18.72	68.40 ± 17.04	0
After 1 week	53.60 ± 12.89	49.35 ± 12.18	0
After 4 weeks	54.90 ± 13.55	51.85 ± 13.15	0



Graph 1: Visual analog scale score distribution among the groups

However, pain was greater at 4 weeks, but, pain was always decreased compared to that before injection (Tables 1 to 7 and Graphs 1 to 5).

Table 4: Shoulder pain disability index distribution among the groups

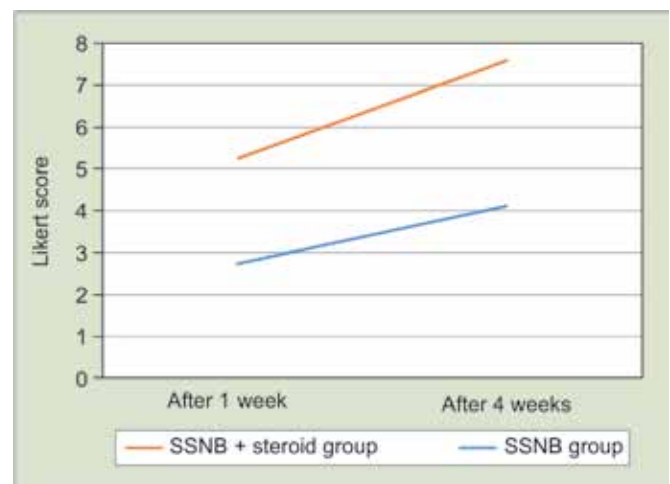
	SSNB group (mean ± SD)	SSNB + steroid group (mean ± SD)	p-value
Before block	64.96 ± 15.87	65.05 ± 15.94	0
After 1 week	51.88 ± 12.34	50.03 ± 12.44	0
After 4 weeks	53.35 ± 12.67	53.27 ± 13.17	0

Table 5: Shoulder pain disability index total distribution

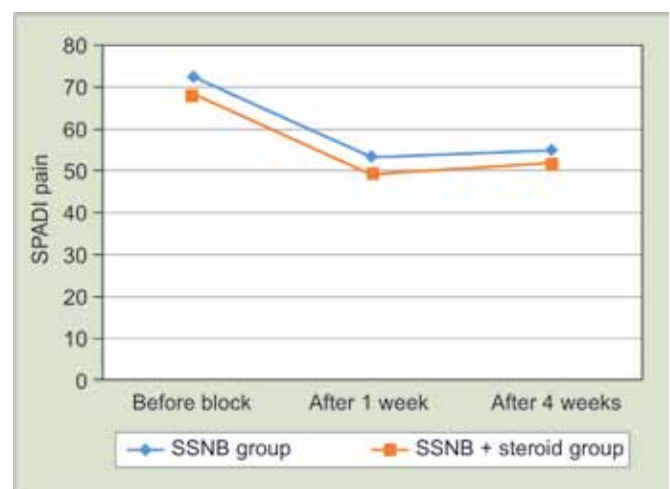
	SSNB group (mean ± SD)	SSNB + steroid group (mean ± SD)	p-value
Before block	68.43 ± 17.02	66.72 ± 16.28	0
After 1 week	52.78 ± 12.49	50.01 ± 12.29	0
After 4 weeks	54.74 ± 13.63	52.83 ± 13.03	0

Table 6: Sex distribution between the groups

	Males		Females	
SSNB group	18	90%	2	10%
SSNB + steroid group	12	60%	8	40%

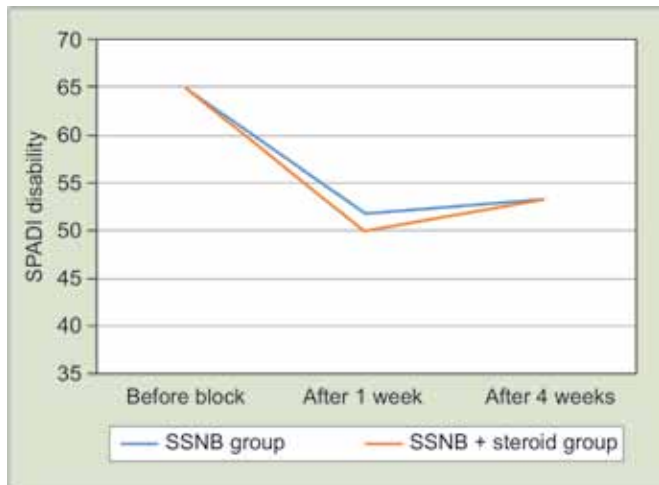


Graph 2: Likert scale distribution among the groups

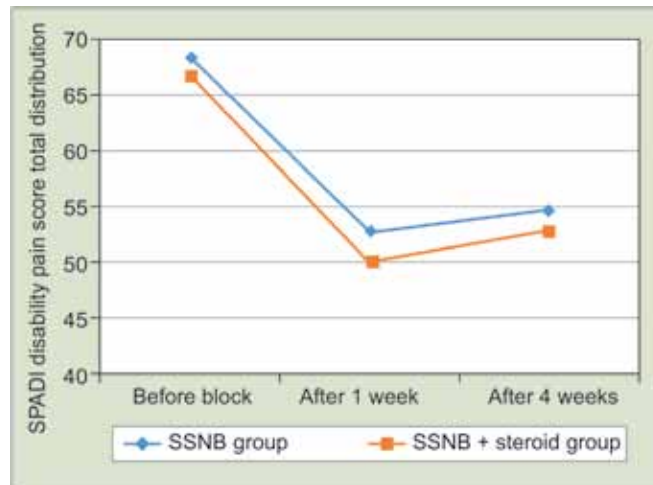


Graph 3: Shoulder pain disability index pain distribution among the groups





Graph 4: Shoulder pain disability index distribution among the groups



Graph 5: Shoulder pain disability index total distribution

Table 7: Age distribution between the groups

	Mean (years)	SD (years)
SSNB group	43.45	11.65
SSNB + steroid group	46.70	14.40

DISCUSSION

Shoulder pain from inflammatory arthritis and/or degenerative disease is a common cause of morbidity in the community. It is difficult to treat and there are limited data on the efficacy of most interventions.

Suprascapular nerve block has shown promise in limited trials in reducing shoulder pain. There have been no large randomized placebo controlled trials examining the efficacy of SSNB and IAI combined for shoulder pain in arthritis and/or degenerative disease using pain and disability end points. Whereas it is possible that SSNB may provide more long-term benefits, we think this unlikely because others have failed to demonstrate outcome differences after 24 hours.⁵⁻⁷

Intra-articular steroid injection has been hypothesized in a study by Marx et al,⁸ that early treatment with intra-articular corticosteroid provides a chemical ablation of the synovitis, thus limiting the subsequent development of fibrosis and shortening the natural history of the disease. The use of intra-articular corticosteroid helps in limiting the fibrotic process in the capsule. With resolution of the synovitis and termination of capsular scar formation, capsular remodeling and recovery of range of motion (ROM) occurs. This hypothesis is supported by the orthopedic and rheumatologic literature.^{9,10}

There does seem to be an effect from intra-articular local anesthesia (IA LA) and comparisons with saline result in a reduced analgesic requirement in the IA LA groups. However, the extent of this effect seems relatively small.¹¹ Nisar et al reported comparable analgesia from IA LA in comparison with suprascapular and interscalene block (SSISB).¹²

Singelyn et al found SSISB to provide superior analgesia to IA LA.¹³ Contreras-Dominguez et al found that single shot IA LA and morphine provided equivalent analgesia to combined interscalene block (CISB) with a weak 0.0625% bupivacaine solution for 12 hours but poorer analgesia and patient satisfaction in the subsequent 36 hours with higher nausea scores and lower patient satisfaction in the IA group.¹⁴

Results from studies of IA LA have been very mixed. However, the regimen is still widely used in clinics for pain and steroid-mediated inflammation reduction. On the other end, SSNB has been shown to be a safe and effective treatment for chronic shoulder pain from arthritis.¹⁵

The suprascapular nerve takes up about 70% of the sensory nerves in the shoulder joint. Blockage of the nerve is very effective in relieving pain.

Shanahan et al demonstrated that SSNB was efficacious without the need to image the area by ultrasound or fluoroscopy during the procedure.¹⁵ Whether the efficacy would be further improved with the combination of nerve block with other approaches to pain relief has been a potentially worthwhile area to study, an attempt of exploring which has been done here by combining the two crucial modalities, i.e. SSNB (using our novel technique) and IAI.

Our novel technique is closely in correlation to the technique described by Dangoisse et al.¹⁷ However, the major difference is in the direction of needle introduction. This helps to block most of the articular branches of the shoulder joint which can have high anatomic variability.⁴

It has been proposed that shoulder stiffness begins with an inflammatory phase that is followed with scar formation. The theoretical benefit of an IAI of steroid is to decrease, thus, the inflammatory phase, decrease pain, and prevent further stiffness from developing.¹⁶

CONCLUSION

Pain in the patients with chronic shoulder pain can be improved with selection of proper injection method and combination of interventional modalities for each individual. The results of this study show a clear benefit from the use of SSNB combined with IAI, in patients with chronic shoulder pain. There was a statistically and clinically significant reduction in pain. This benefit was prolonged as well. There were no significant side effects from the injection, which was well tolerated by most of the patients.

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