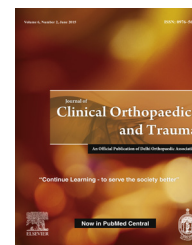


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## Original Article

# Clinical evaluation of post-operative analgesia comparing suprascapular nerve block and interscalene brachial plexus block in patients undergoing shoulder arthroscopic surgery<sup>☆</sup>



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## ABSTRACT

**Background:** Shoulder arthroscopic surgeries have a high incidence of severe post-operative pain significant enough to interfere with recovery and rehabilitation. A regional anaesthetic technique combined with general anaesthesia reduces intra-operative requirements of anaesthesia and provides a better post-operative pain relief. As the commonly employed technique of interscalene brachial plexus block (ISB) is associated with potential serious complications, suprascapular nerve block (SSB) can be used as a safer alternative.

**Methods and material:** In this prospective study, 60 ASA 1 or 2 adult patients undergoing shoulder arthroscopic surgery were randomised into two groups – ISB and SSB. In group ISB, ISB with 20 ml of 0.5% bupivacaine mixed with 75 µg clonidine was given. In the SSB group SSB was given with 15 ml of 0.5% bupivacaine with 75 µg clonidine. Pain was assessed using visual analogue scale and verbal pain scale scores and time to first rescue analgesia was noted. We used Student's t test and Chi-square/Fisher Exact test and used a statistical software to compare data.

**Results:** In the present study, the mean duration of analgesia was 2.53 ± 2.26 h in SSB group compared to 7.23 ± 6.83 h in group ISB (*p* value < 0.05). Overall rescue analgesic

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requirements were higher in SSB group compared to ISB group (63.3% versus 40.0%) but this was statistically not significant ( $p$  value  $> 0.05$ ).

**Conclusion:** Both interscalene and SSB can be used to provide intra-operative and post-operative analgesia in patients undergoing shoulder arthroscopy.

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## 1. Introduction

These days most of the shoulder joint surgeries are done arthroscopically in ambulatory settings as most patients like to have minimum scar, duration of surgery and hospital stay. Arthroscopic shoulder surgery has a 45% incidence of severe intra-operative and post-operative pain<sup>1</sup> that is often significant enough to interfere with initial recovery and rehabilitation, and which can be difficult to manage without large dose opioids.<sup>2</sup> Regional anaesthetic techniques have the ability to control pain effectively, both at rest and on movement, allowing earlier mobilisation without the adverse effects of opioids.<sup>3</sup>

General anaesthesia (GA) with a regional nerve block reduces intra-operative requirements of anaesthesia, resulting in rapid recovery and improvement in the quality of post-operative pain relief in arthroscopic shoulder surgeries.<sup>3</sup>

A commonly used nerve block technique for this purpose is interscalene brachial plexus block (ISB) and its efficacy is well established. Even in a small dose, single dose ISB provides significant analgesia.<sup>2,4,5</sup> However, ISB is associated with potential serious complications, which include inadvertent epidural and spinal anaesthesia, vertebral artery injection, paralysis of vagus, recurrent laryngeal and cervical sympathetic nerves block,<sup>6</sup> etc. Phrenic nerve block occurs in all patients undergoing ISB.<sup>7,8–10</sup>

To avoid these complications of ISB, an alternative technique of suprascapular nerve block (SSB) has been suggested for post-operative analgesia after shoulder arthroscopy. The suprascapular nerve provides sensory fibres to 70% of the shoulder joint. While SSB cannot be used alone for surgery, it provides excellent pain relief and induces fewer side effects than intravenous patient controlled analgesia with morphine.<sup>3,11</sup>

Various additives to local anaesthetic solutions have been used to prolong the duration and increase the efficacy of blocks.<sup>12,13</sup> Clonidine has been shown to increase the duration of local anaesthetic action and prolong post-operative analgesia when included in single-injection nerve blocks.<sup>14</sup> Clonidine appears to be superior to epinephrine in enhancing the duration of plexus blockade with bupivacaine and offers better haemodynamic stability<sup>15</sup> while avoiding the potential risks of epinephrine.<sup>16</sup>

## 2. Methods

The aim of our prospective randomised study was to evaluate and compare the intra-operative and post-operative analgesic

efficacy of SSB and interscalene block in patients undergoing arthroscopic surgery of shoulder joint under GA.

After institutional approval and informed written consent, 60 patients in the age group of 18–60 years of either sex, with ASA physical status 1 or 2, scheduled to undergo elective arthroscopic shoulder surgeries under GA were randomised into two groups (30 each). Patients were excluded if they were unable to understand procedure and/or pain scales, had a body weight  $< 50$  kg or  $> 100$  kg, had pre-existing neurological deficit or pulmonary disease, diabetes, local skin infection or coagulation disorders. Patients with history of hypersensitivity to any of the medications used in the anaesthetic procedure or opioid or clonidine therapy in pre-operative period were also excluded. All patients were evaluated in the pre-anaesthetic clinic with a detailed history and relevant investigations were done.

Pre-operatively, patients were instructed in the use of visual analogue scale (VAS) and the verbal pain scale (VPS) for pain, nausea and vomiting, and sedation scores. Pre-operative baseline VAS and VPS scores were assessed 1 h before surgery at rest and on abduction of the shoulder and maximum score was recorded.

In group SSB, nerve block was performed at the suprascapular notch with the patient sitting up and leaning forward using the posterior approach described by Moore.<sup>17</sup> A line was drawn along the length of the spine of the scapula and was bisected with a vertical line, parallel to vertebral spine, forming four quadrants. After skin preparation and draping, the angle of the upper outer quadrant was bisected and the skin was infiltrated with 2 ml of 1% lignocaine at a point 2.5 cm along this line of bisection. Under sterile conditions, a short bevelled 22 G insulated needle was introduced perpendicular to the skin. By using peripheral nerve stimulator (Plexygon, Vygon, France), the suprascapular nerve was located using a 100 mm insulated needle by stimulation with a 0.5 mA (impulse frequency 2 Hz and duration 300  $\mu$ s) current. Stimulation of the suprascapular nerve caused contraction of the supraspinatus and infraspinatus muscles and led to an abduction and external rotation of the arm respectively. In most patients, a loss of resistance was noticed as the needle slid into the suprascapular notch. At this point 15 ml of 0.5% bupivacaine with 75  $\mu$ g of clonidine was injected after repeated negative aspiration. An additional 5 ml was infiltrated subcutaneously over the shoulder region to block cutaneous sensory branches of C3 and C4 nerve roots (Figs. 1 and 2).

In group ISB, block was performed following Winnie's landmarks.<sup>11,18</sup> Using this technique, the plexus was approached at the C6 level (cricoid cartilage) where the roots of the brachial plexus (C5 through T1) pass between the anterior and middle scalene muscles in interscalene groove.

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