

# Supraclavicular Brachial Plexus Block with or Without Dexamethasone as an Adjuvant to 0.5% Levobupivacaine

Rakesh Kumar<sup>1</sup>, Tarun Kumar Danda<sup>1</sup>, Atul Tandon<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Anaesthesia, Varun Arjun medical College and Ruhelkhand Hospital, Shahjahanpur, U.P, India, <sup>2</sup>Associate Professor, Department of Surgery, Varun Arjun medical College and Ruhelkhand Hospital, Shahjahanpur, U.P, India.

## Abstract

**Background:** Brachial plexus block is good alternative to general anesthesia for upper limb surgery. The present study was conducted to assess supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine. **Subjects and Methods:** 40 patients in the age group of 18-60 years were randomly divided in two groups of 20 patients. In group I, patients received 30 ml of 0.5% isobaric levobupivacaine with 2 ml of isotonic sodium chloride. In group II patients received 8 mg (2ml) dexamethasone in addition to 30 ml of 0.5% isobaric levobupivacaine. **Results:** The mean onset of sensory block was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.6 minutes in group I and 13.2 minutes in group II, duration of sensory blockade was 620.4 minutes in group I and 914.8 minutes in group II, duration of motor blockade was 542.6 minutes in group I and 712.6 minutes in group II and total analgesic requirement was seen in 22 minutes in group I and 4 patients in group II. The difference was significant ( $P < 0.05$ ). **Conclusion:** Dexamethasone reduced the time to onset of sensory and motor blockage and prolongs the duration of analgesia.

**Keywords:** Dexamethasone, Sensory, Motor Blockage.

**Corresponding Author:** Tarun Kumar Danda, Associate Professor, Department of Anaesthesia, Varun Arjun medical College and Ruhelkhand Hospital, Shahjahanpur, U.P, India.  
E-mail: [drtarundanda@gmail.com](mailto:drtarundanda@gmail.com)

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## Introduction

Brachial plexus block is an excellent method for attaining optimal operating conditions for upper limb surgeries by producing complete muscular relaxation, maintaining haemodynamic stability and the associated sympathetic block.<sup>[1]</sup> They also provide extended postoperative analgesia with minimal side effects. In addition, it offers a better preservation of mental functions in elderly; decreased risk of aspiration due to intact pharyngeal and laryngeal reflexes; avoids difficult intubation; decreases postoperative complications associated with intubation and provides better postoperative analgesia without undue sedation facilitating early mobilization and discharge.<sup>[2]</sup>

Brachial plexus block is good alternative to general anesthesia for upper limb surgery. This avoids the unwanted effect of anesthetic drugs used during general anesthesia and the stress of upper airway instrumentation.<sup>[3]</sup> Various additives such as opioids, clonidine, and verapamil were added to local anesthetics to achieve quick, dense, and prolonged block, but the results are either inconclusive or associated with side effect. Steroids have powerful anti-inflammatory

as well as analgesic property. They relieve pain by reducing inflammation and blocking transmission of nociceptive C-fibers and by suppressing ectopic neural discharge.<sup>[4,5]</sup>

Use of steroids as adjuvant to local anaesthetic drug in brachial plexus block is gaining popularity. Recently, dexamethasone has been studied as an adjuvant to local anaesthetic in peripheral nerve block.<sup>[5]</sup> The present study was conducted to assess supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

## Subjects and Methods

The present study was conducted among 40 patients in the age group of 18-60 years with ASA physical status I or II. All were informed regarding the study and their written consent was obtained.

Data pertaining to patients such as name, age, gender etc. was recorded. Patients were randomly divided in two groups of 20 patients. In group I, patients received 30 ml of 0.5% isobaric levobupivacaine with 2 ml of isotonic sodium chloride.

In group II patients received 8 mg (2ml) dexamethasone in addition to 30 ml of 0.5% isobaric levobupivacaine. Parameters such as duration of surgery, onset of sensory block, motor block, duration of sensory block, duration of motor block and total analgesic requirement was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

[Table 1] shows that group I had 12 males and 8 females and group II had 9 males and 11 females.

[Table 2, Figure 1] shows that mean onset of sensory block was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.6 minutes in group I and 13.2 minutes in group II, duration of sensory blockade was 620.4 minutes in group I and 914.8 minutes in group II, duration of motor blockade was 542.6 minutes in group I and 712.6 minutes in group II and total analgesic requirement was seen in 22 minutes in group I and 4 patients in group II. The difference was significant ( $P < 0.05$ ).

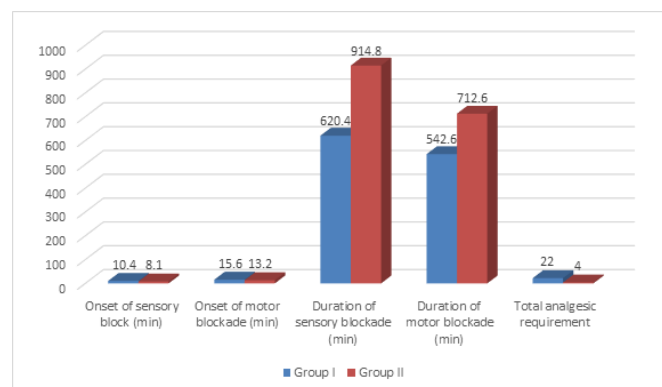


Figure 1: Assessment of parameters

## Discussion

A regional technique should always be considered whenever general condition of the patient is poor, or the patients is not adequately prepared or in the presence of associated condition like uncontrolled diabetes, hypertension, cardiovascular, or respiratory diseases.<sup>[6]</sup> It is also useful when the patients prefers to retain his consciousness during surgery and when it is important for the patient to remain ambulatory.<sup>[7]</sup> Various approaches to brachial plexus block have been described, but supraclavicular brachial plexus block is widely employed peripheral nerve block to provide anesthesia and analgesia for upper limb surgeries. It avoids the unwanted effect of the

anesthetic drugs used during general anesthesia and the stress response of laryngoscope and tracheal intubation. We had selected supraclavicular approach to brachial plexus block.<sup>[8]</sup>

Steroids have nerve block prolonging effects by blocking transmission of nociceptive myelinated c-fibres and suppressing ectopic neuronal discharge. They are also thought to alter the function of potassium channels in the excitable cells.<sup>[9]</sup> Thus, dexamethasone was selected as an adjuvant to local anaesthetic (levobupivacaine) in this study because it has been reported to prolong duration of action of local anaesthetics with no respiratory depression.<sup>[10]</sup> The present study was conducted to assess supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

In present study, group I had 12 males and 8 females and group II had 9 males and 11 females. Baloda et al,<sup>[11]</sup> conducted a study to assess the effect of adding dexamethasone to levobupivacaine in supraclavicular brachial plexus block. To observe the effect of dexamethasone on onset and duration of anaesthesia, when used as an adjuvant to levobupivacaine in supraclavicular brachial plexus block. A total of 60 patients in the age group of 18-65 years belonging to ASA physical status I or II were included in the study. They are randomly allocated in two groups and each group included 30 patients. In group 1, patients received 30 ml of 0.5% isobaric levobupivacaine with 2 ml of isotonic sodium chloride. In group 2 patients received 8 mg (2ml) dexamethasone in addition to 30ml of 0.5% isobaric levobupivacaine. The results showed that the onset of sensory and motor block were faster in group 2 ( $p < 0.05$ ). The duration of sensory and motor block were significantly longer in group 2 ( $p < 0.05$ ). VAS score at 12 hours were significantly lower in group 2 ( $p < 0.05$ ). None of the patients had bradycardia, hypotension or any other side effects.

We found that mean onset of sensory block was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.6 minutes in group I and 13.2 minutes in group II, duration of sensory blockade was 620.4 minutes in group I and 914.8 minutes in group II, duration of motor blockade was 542.6 minutes in group I and 712.6 minutes in group II and total analgesic requirement was seen in 22 minutes in group I and 4 patients in group II.

Solani et al,<sup>[12]</sup> included fifty patients of the American Society of Anaesthesiologist Grade I-II undergoing various upper limb surgeries under supraclavicular brachial plexus block and randomly divided into two groups. In Group C, patients received 32 ml of mixture of 1.5% lignocaine-adrenaline 10 ml, 0.5% bupivacaine 20 ml and normal saline 2 ml, whereas in Group D, patients received the same amount of local anesthetics with dexamethasone 2 ml (8 mg). Sensory and motor block were recorded at the regular intervals. Postoperative analgesia was assessed using visual analog scale (VAS) score. The mean onset time of sensory and motor block

**Table 1: Distribution of patients**

Groups	Group I	Group II
Method	Isobaric levobupivacaine +2 ml of NaCl	Isobaric levobupivacaine+ 8 mg dexamethasone
M:F	12:8	9:11

**Table 2: Assessment of parameters**

Parameters	Group I	Group II	P value
Onset of sensory block (min)	10.4	8.1	0.05
Onset of motor blockade (min)	15.6	13.2	0.02
Duration of sensory blockade (min)	620.4	914.8	0.01
Duration of motor blockade (min)	542.6	712.6	0.04
Total analgesic requirement	22	4	0.03

was  $3.24 \pm 1.09$  min and  $6.2 \pm 1.44$  min in Group D and  $4.24 \pm 1.42$  min and  $7.52 \pm 1.50$  min in Group C, respectively. There was markedly prolonged duration of analgesia in Group D (12–16 h) compared to Group C (4–5 h). The mean VAS score was  $4.16 \pm 1.39$  at the end of 6 h in Group C, whereas it was 0 (zero) in Group D at the same time. The difference was statistically significant ( $P < 0.05$ ).

## Conclusion

Authors found that addition of dexamethasone reduced the time to onset of sensory and motor blockage and prolongs the duration of analgesia.

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