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## Assessment of supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine

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### Abstract

**Background:** 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. The present study was conducted to assess supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

**Materials and methods:** 50 patients of 18-60 years were allocated in two groups of 25 each. In group I, patients received 30 ml of 0.5% isobaric levobupivacaine with 2 ml of isotonic sodium chloride. In group II patients received 8mg (2ml) dexamethasone in addition to 30ml of 0.5% isobaric levobupivacaine.

**Results:** Group I had 15 males and 10 females and group II had 12 males and 13 females. The mean duration of surgery was 62.4 minutes in group I and 63.2 minutes in group II, onset of sensory blockade was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.4 minutes and 13.2 minutes, duration of sensory blockade was 658.2 minutes and 925.6 minutes, duration of motor blockade was 572.4 minutes and 764.2 minutes and total analgesic requirement was 22 and 1 in group I and in group II respectively. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Dexamethasone found to reduce the time to onset of sensory and motor blockage and prolongs the duration of analgesia.

**Keywords:** Brachial plexus, dexamethasone, sensory blockage

### Introduction

Peripheral neural blockade is now a well-accepted component of post-operative pain management. Ultrasound-guided supraclavicular brachial plexus (SCBP) block provides not only intraoperative anaesthesia and post-operative analgesia but also reduce many complications like intravascular injection<sup>[1]</sup>.

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. 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>.

Steroids have nerve block prolonging effects by blocking transmission of nociceptive myelinated c-fibres and suppressing ectopic neuronal discharge. Levobupivacaine has less systemic toxicity than bupivacaine<sup>[3]</sup>. Its limiting factors are late onset and limited duration of analgesia even when used with adjuvants like opioids that produce opioid-related side effects. Studies have shown that dexamethasone can prolong the effect of regional anaesthesia. Dexamethasone as an adjuvant may avoid opioid-related side effects. There is very limited literature available regarding the use of dexamethasone as an adjuvant to levobupivacaine<sup>[4]</sup>. They are also thought to alter the function of potassium channels in the excitable cells. 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 [5]. The present study was conducted to assess supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

**Materials and Methods**

The present study was conducted among 50 patients of 18-60 years age group with ASA physical status I or II. All patients were informed regarding the study and their consent was obtained. Data such as name, age, gender etc. was recorded. Patients were allocated in two groups of 25 each.

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

**Results**

**Table 1:** Distribution of patients

Groups	Group I	Group II
Drug	30ml of 0.5% isobaric levobupivacaine+ 2ml of isotonic sodium chloride	8mg dexamethasone + 30ml of 0.5% isobaric levobupivacaine
M:F	15:10	12:13

Table 1 shows that group 1 had 15 males and 10 females and group 2 had 12 males and 13 females. Qualities of the operative condition in both groups were

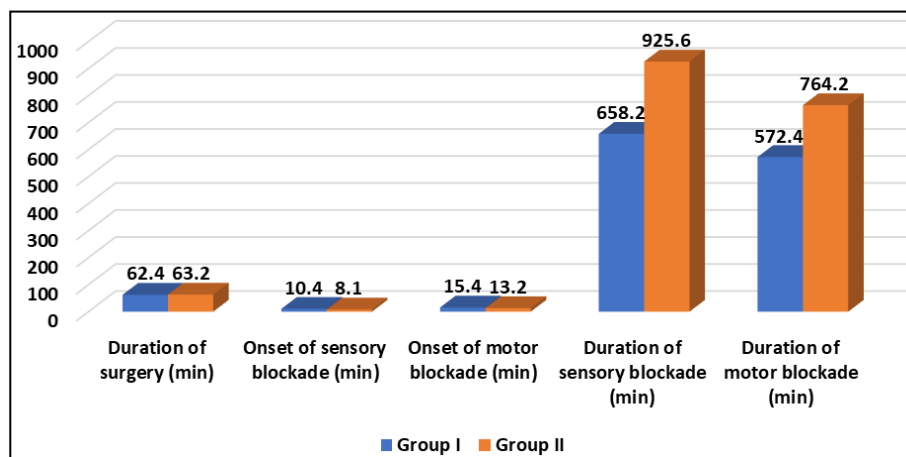
excellent, and there was no statistically significant difference between two groups.

**Table 2:** Comparison of parameters

Parameters	Group I	Group II	P value
Duration of surgery (min)	62.4	63.2	0.12
Onset of sensory blockade (min)	10.4	8.1	0.05
Onset of motor blockade (min)	15.4	13.2	0.05
Duration of sensory blockade (min)	658.2	925.6	0.01
Duration of motor blockade (min)	572.4	764.2	0.02
Total analgesic requirement	22	1	0.001

Table 2, Figure 1 shows that mean duration of surgery was 62.4 minutes in group I and 63.2 minutes in group II, onset of sensory blockade was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.4 minutes and 13.2 minutes, duration of sensory blockade was 658.2 minutes and 925.6 minutes, duration of motor

blockade was 572.4 minutes and 764.2 minutes and total analgesic requirement was 22 and 1 in in group I and in group II respectively. The difference was significant ( $P < 0.05$ ). There were no side effects during intra- and post-operative period.



**Fig 1:** Comparison of parameters

**Discussion**

Many adjuvants to local anaesthetics such as clonidine, tramadol, dexmedetomidine and neostigmine have been studied in brachial plexus block, but each drug has its own side effects [6]. Recently, dexamethasone, a long-acting glucocorticoid has proven its efficacy as an adjuvant to local anaesthetics in brachial plexus block [7]. It produces vasoconstriction and reduces the absorption of local anaesthetics and thereby prolongs the action of local

anaesthetics [8]. Many other studies reported the prolonged duration of sensory and motor block when dexamethasone was used as an adjuvant with bupivacaine and lignocaine in brachial plexus block, but they differed regarding the onset of sensory and motor block [9]. 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 patients received 30 ml of 0.5%

isobaric levobupivacaine with 2ml of isotonic sodium chloride, group II patients received 8 mg (2ml) dexamethasone in addition to 30ml of 0.5% isobaric levobupivacaine. Pani *et al.* [10] assessed analgesic efficacy of dexamethasone as adjuvant to levobupivacaine in SCBP block. Ultrasound-guided SCBP block was given to sixty patients, randomly assigned into two groups. Group S (thirty patients) received 2 mL normal saline with 25 mL levobupivacaine (0.5%) and Group D (thirty patients) received 2 mL of dexamethasone (8 mg) with 25 mL of levobupivacaine (0.5%), respectively. Time for the first rescue analgesia, number of rescue analgesics required in 24 h and different block characteristics was assessed. Time for request of the first rescue analgesia was  $396.13 \pm 109.42$  min in Group S and  $705.80 \pm 121.46$  min in Group D ( $P < 0.001$ ). The requirement for rescue analgesics was more in Group S when compared to Group D. The onset of sensory and motor block was faster in Group D when compared to Group S. The mean duration of sensory and motor block was significantly longer in Group D than Group S.

We found that mean duration of surgery was 62.4 minutes in group I and 63.2 minutes in group II, onset of sensory blockade was 10.4 minutes in group I and 8.1 minutes in group II, onset of motor blockade was 15.4 minutes and 13.2 minutes, duration of sensory blockade was 658.2 minutes and 925.6 minutes, duration of motor blockade was 572.4 minutes and 764.2 minutes and total analgesic requirement was 22 and 1 in in group I and in group II respectively.

Baloda *et al.* [11] observed 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 30ml of 0.5% isobaric levobupivacaine with 2ml of isotonic sodium chloride. In group 2 patients received 8mg (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.

## Conclusion

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

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