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Original Research

Supraclavicular brachial plexus block with or without dexamethasone

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ABSTRACT

Background: Brachial plexus block avoids unwanted complications due to administration of various drugs in general anesthesia and in the process of upper airway instrumentation. The present study assessed efficacy of supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

Materials & Methods: 70 patients with ASA physical status I or II of both genderswere divided into 2 groups of 35 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 30 ml 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:** Group I had 15 males and 20 females and group II had 18 males and 17 females. The mean duration of surgery was 72.6 minutes in group I and 85.2 minutes in group II, onset of sensory blockade was 13.4 minutes in group I and 11.1 minutes in group II, onset of motor blockade was 18.7 minutes and 16.2 minutes, duration of sensory blockade was 652.2 minutes and 924.6 minutes, duration of motor blockade was 572.6 minutes and 770.2 minutes and total analgesic requirement was 24 and 8 in group I and in group II respectively. The difference was significant ($P< 0.05$). **Conclusion:** Dexamethasone reduced the time to onset of sensory and motor blockage and prolonged the duration of analgesia.

Key words: Dexamethasone, Brachial plexus,ultrasound

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INTRODUCTION

Brachial plexus block is especially intended for the upper limb surgeries. Brachial plexus block avoids unwanted complications due to administration of various drugs in general anesthesia and in the process of upper airway instrumentation.[1] There are various approaches to brachial plexus block, but the supraclavicular approach is the most common approach to brachial plexus because of compact arrangement of the nerve trunks.[2] Use of ultrasound for the performance of supraclavicular block has become the gold standard since it enables the clinician to deposit the local anesthetic close to the nerves in real time and is usually devoid of complications.Peripheral neural blockade is now a well-accepted component of post-operative pain management.[3] Ultrasound-guided supraclavicular brachial plexus (SCBP) block provides not only intraoperative anaesthesia and post-operative analgesia but also reduce many complications like intravascular injection.[1]Steroids have nerve block prolonging effects by blocking transmission of nociceptive myelinated c-fibres and suppressing ectopic neuronal discharge.[4]

Various pharmacokinetic, animal and clinical studies not only confirm the cardiac toxicity of racemic bupivacaine but experimental studies with levobupivacaine also indicate lower cardiovascular depressant effect and central nervous system toxicity.[5]Levobupivacaine has less systemic toxicity than bupivacaine. Its limiting factors are late onset and limited duration of analgesia even when used with adjuvants like opioids that produce opioid-related side effects.[6] Studies have shown that dexamethasone can prolong the effect of regional anaesthesia. Dexamethasone as an adjuvant may avoid opioid-related side effects.[7]The present study assessed efficacy of supraclavicular brachial plexus block with

or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

MATERIALS & METHODS

The present study comprises of 70 patients with ASA physical status I or II of both genders. All patients were informed regarding the study and their consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 35 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 30 ml 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 I: Distribution of patients

Groups	Group I (35)	Group II(35)
Agent	30ml of 0.5% isobaric levobupivacaine+ 2ml of isotonic sodium chloride	8mg dexamethasone + 30ml of 0.5% isobaric levobupivacaine
M:F	15:20	18:17

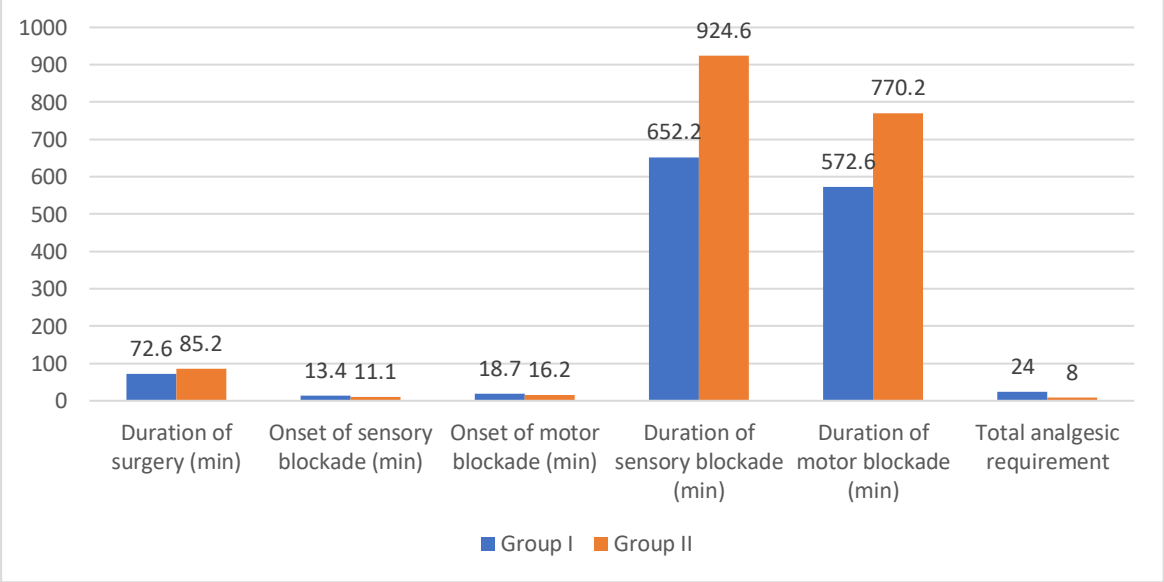
Table I shows that group I had 15 males and 20 females and group II had 18 males and 17 females.

Table II: Comparison of parameters

Parameters	Group I	Group II	P value
Duration of surgery (min)	72.6	85.2	0.04
Onset of sensory blockade (min)	13.4	11.1	0.02
Onset of motor blockade (min)	18.7	16.2	0.81
Duration of sensory blockade (min)	652.2	924.6	0.05
Duration of motor blockade (min)	572.6	770.2	0.02
Total analgesic requirement	24	8	0.01

Table II, graph I shows that mean duration of surgery was 72.6 minutes in group I and 85.2 minutes in group II, onset of sensory blockade was 13.4 minutes in group I and 11.1 minutes in group II, onset of motor blockade was 18.7 minutes and 16.2 minutes, duration of sensory blockade was 652.2 minutes and 924.6 minutes, duration of motor blockade was 572.6 minutes and 770.2 minutes and total analgesic requirement was 24 and 8 in group I and in group II respectively. The difference was significant (P< 0.05).

Graph I: Comparison of parameters



DISCUSSION

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.[8,9] 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.[1]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.[10] The present study assessed efficacy of supraclavicular brachial plexus block with or without dexamethasone as an adjuvant to 0.5% levobupivacaine.

We observed that group I had 15 males and 20 females and group II had 18 males and 17 females. Persec et al[11] had done randomized controlled study, assessed 70 patients undergoing upper-extremity surgeries using ultrasound-guided single-shot supraclavicular blockade and investigated the analgesic effect of low dose dexamethasone added to levobupivacaine. Shrestha et al[12] confirmed that addition of dexamethasone leads to significantly faster onset of action and prolonged duration of analgesia for brachial plexus block, without any unwanted side effects.

We found that mean duration of surgery was 72.6 minutes in group I and 85.2 minutes in group II, onset of sensory blockade was 13.4 minutes in group I and 11.1 minutes in group II, onset of motor blockade was 18.7 minutes and 16.2 minutes, duration of sensory blockade was 652.2 minutes and 924.6 minutes, duration of motor blockade was 572.6 minutes and 770.2 minutes and total analgesic requirement was 24 and 8 in group I and in group II respectively. Biradar et al[13] added dexamethasone to lidocaine in supraclavicular brachial plexus block and concluded that addition of dexamethasone to 1.5% Lidocaine with Adrenaline in supraclavicular brachial plexus block reduced the onset time of sensory and motor blockade and prolonged the duration of postoperative analgesia and motor blockade. Pathak RG et al[14] has compared supraclavicular brachial plexus block with and without dexamethasone using a mixture of 1.5% adrenalized xylocaine (20 ml) and 0.5% bupivacaine (16 ml) and concluded that addition of dexamethasone to mixture of local anaesthetic drugs in the brachial plexus block through supraclavicular approach has significantly prolonged motor blockade and duration of postoperative analgesia.Raghove et al[15]have shown that ultrasound-guided supraclavicular block extends the duration of analgesia in comparison to landmark-guided block as there it allows more accurate drug deposition closer to the nerve fibers.

CONCLUSION

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

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