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Original Research Article.

Role of Dexamethasone in Supraclavicular Brachial Plexus Block: A Clinical Study

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ABSTRACT

Background: The present study was conducted to assess the effect of dexamethasone on the onset and duration of anesthesia in low volume supraclavicular brachial plexus block.

Materials & Methods: The present study was conducted on 40 patients of American Society of Anaesthesiologists (ASA) grade I and II of age group 18 - 60 years of either sex. Patients were randomly divided into 2 groups. Group I received 20 ml of 0.5% bupivacaine and 2 ml of normal saline and Group II received 20 ml of 0.5% bupivacaine with 2 ml of dexamethasone 8 mg. In all patients, the duration of analgesia was assessed postoperatively at hourly intervals using visual analog scale (VAS) at 1 hour, 5 hour, 7 hour and 12 hour.

Results: Mean age in group I was 35.27± 12.45 years and in group II was 36.14± 11.05. Mean weight in group I was 58.30± 8.22 years and in group II was 59.20± 10.26 years. Duration of surgery was 86± 8.18 minutes and 88± 8.10 minutes in group I and II respectively. Length of incision was 3.12±1.2 cm in group I and 3.16±1.4 cm in group II. The difference was non-significant (P> 0.05). Mean VAS score was 2.5, 3.8, 4.6 and 6.4 at 1 hour, 5 hour, 7 hour and 12 hours in group I respectively. It was 2.1, 3, 3.2 and 4.5 at 1 hour, 5 hour, 7 hour and 12 hours in group II respectively. The difference was significant (P< 0.05).

Conclusion: Dexamethasone is a beneficial in producing early onset and prolonged duration of analgesia to supraclavicular brachia plexus.

Key words: Brachial Plexus, Dexamethasone, Visual Analog Scale.

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INTRODUCTION

Various modes of anaesthesia have developed till now like general anaesthesia, local anaesthesia, spinal anaesthesia, epidural anaesthesia, intravenous anaesthesia and peripheral nerve blocks. Anaesthetic agents are available in the form of gases, injections and jellies. Supraclavicular block is one of the most effective anaesthetic procedures in an operation of upper extremity. The supraclavicular block is often called as spinal anaesthesia of upper extremities because of ubiquitous application for upper extremity surgeries.[1]

An ideal local agent should have a fast sensory onset, differential offset, early offset of motor than sensory enabling early ambulation with prolonged analgesia.

Various local anaesthetic agents are used for supraclavicular block such as lignocaine, mepevacaine, bupivacaine, ropivacaine and levobupivacaine.[2] In contrast to other local anaesthetics, other central nervous system effects are drowsiness, mental clouding, altered taste and tinnitus. Levobupivacaine and Ropivacaine for is used for interscalene and femoral nerve blocks and demonstrated that levobupivacaine and ropivacaine produce comparable postoperative analgesia when used for interscalene and femoral nerve blocks.[3] Dexamethasone, a long-acting glucocorticoid has potent anti-inflammatory and analgesic effects. It was proved to be beneficial in peripheral nerve blocks. The effect of dexamethasone as an adjuvant has been explored by previous studies, but its role in the context of a lower volume of a local anesthetic agent under ultrasound guided blocks is still unclear.[4] The present study was conducted to assess the effect of dexamethasone on the onset and duration of anesthesia in low volume supraclavicular brachial plexus block.

MATERIALS & METHODS

The prospective, randomised, double blind study was conducted in the Department of Anaesthesiology, PGIMER, Chandigarh, India. It comprised of 4o patients of American Society of Anaesthesiologists (ASA) grade I and II of age group 18 - 60 years of either sex. All were informed regarding the study and written consent was obtained. Ethical approval was obtained prior to the study.

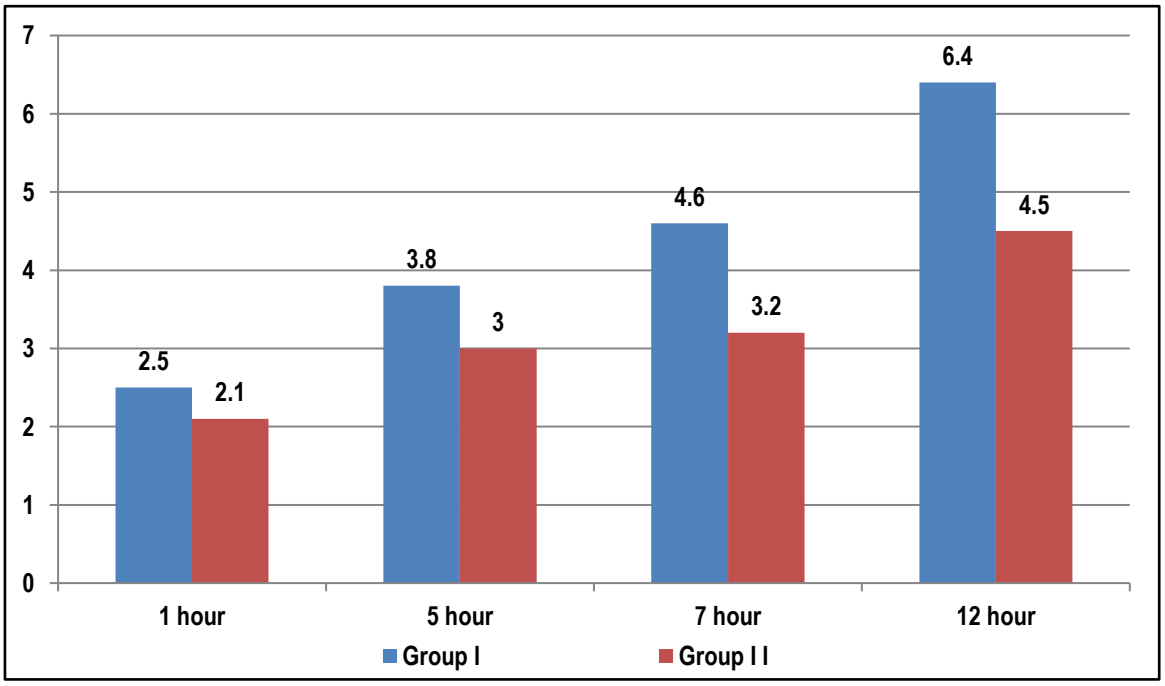
Patients with allergy to study medications, history of significant neurological, psychiatric, neuromuscular, cardiovascular, pulmonary, renal, or hepatic disease, history of alcohol or drug abuse, pregnant or lactating women, patients on psychotropic or adrenergic drugs and patients receiving chronic analgesic therapy were excluded from the study.

Patients were randomly divided into 2 groups. Group I received 20 ml of 0.5% bupivacaine and 2 ml of normal saline and Group II received 20 ml of 0.5% bupivacaine with 2 ml of dexamethasone 8 mg. In all patients, the duration of analgesia was assessed postoperatively at hourly intervals using visual analog scale (VAS). Hemodynamic variables such as pulse rate, systolic blood pressure, diastolic blood pressure, and respiratory rate was assessed at 1 hour, 5 hour, 7 hour and 12 hour. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Table I: Parameters in patients

Parameters	Group I	Group I I	P value
Age (years)	35.27± 12.45	36.14± 11.05	0.1
Weight (Kgs)	58.30± 8.22	59.20± 10.26	0.5
Duration of surgery (mins)	86± 8.18	88± 8.10	0.2
Length of incision (cm)	3.12±1.2	3.16±1.4	0.1

Graph I: Comparison of VAS score in both groups



RESULTS

Table I shows that mean age in group I was 35.27± 12.45 years and in group II was 36.14± 11.05. Mean weight in group I was 58.30± 8.22 years and in group II was 59.20± 10.26 years. Duration of surgery was 86± 8.18 minutes and 88± 8.10 minutes in group I and II respectively. Length of incision was 3.12±1.2 cm in group I and 3.16±1.4 cm in group II. The difference was non-significant (P> 0.05).

Graph I shows that mean VAS score was 2.5, 3.8, 4.6 and 6.4 at 1 hour, 5 hour, 7 hour and 12 hours in group I respectively. It was 2.1, 3, 3.2 and 4.5 at 1 hour, 5 hour, 7 hour and 12 hours in group II respectively. The difference was significant (P< 0.05).

DISCUSSION

Bupivacaine is a local anaesthetic drug with long duration, having similar pharmacology to bupivacaine, however, it has wider safety margin and was shown to possess less cardiotoxicity in comparison with bupivacaine. Shrestha al[5] studied that same concentration of epidural levobupivacaine and bupivacaine with fentanyl provide stable postoperative analgesia and both were found safe for the patients undergoing major abdominal surgery. In present study we assessed the effect of dexamethasone on the onset and duration of anesthesia in low volume supraclavicular brachial plexus block.

We observed that mean age in group I was 35.27± 12.45 years and in group II was 36.14± 11.05. Mean weight in group I was 58.30± 8.22 years and in group II was 59.20± 10.26 years. Duration of surgery was 86± 8.18 minutes and 88± 8.10 minutes in group I and II respectively. Length of incision was 3.12±1.2 cm in group I and 3.16±1.4 cm in group II. This is in agreement with Chakarworty et al.[6]

Parveen et al.[7] found 934 ± 68 min vs 342 ± 48.7 minutes of duration of analgesia when dexamethasone was given IV as compared to control group in supraclavicular brachial plexus block with long-acting local anesthetic agent.

In present study, VAS score was 2.5, 3.8, 4.6 and 6.4 at 1 hour, 5 hour, 7 hour and 12 hours in group I respectively. It was 2.1, 3, 3.2 and 4.5 at 1 hour, 5 hour, 7 hour and 12 hours in group II

respectively. The difference was significant (P< 0.05). Our results are in agreement with Estebe et al.[8]

Deepraj et al[9] conducted a study on 50 ASA I or II patients undergoing upper limb surgeries under supraclavicular brachial plexus block. Patients in group I were administered 30 ml of 0.5% Ropivacaine and 2 ml of normal saline and group II were given 30 ml of 0.5% Ropivacaine and 8 mg (2 ml) Dexamethasone. The onset time and duration of sensory and motor blockade were recorded. It was observed that the addition of Dexamethasone as adjunct to Ropivacaine significantly prolonged the duration of sensory block which was 9.44±0.8 hours in group R and 19.52±1.5 hours in group RD, in postoperative period without much change in onset and duration of motor block.

Alarasan et al[10] in their study evaluated the usefulness of dexamethasone in supraclavicular nerve block. The onset of sensory and motor block was 10.36 ± 1.99 and 12 ± 1.64 respectively in dexamethasone group as compared to 12.9 ± 2.23 and 18.03 ± 2.41 minutes in control group. The duration of sensory and motor block was 366 ± 28.11 and 337.33 ± 28.75 respectively in dexamethasone group as compared to 242.66 ± 26.38 and 213 ± 26.80 minutes respectively in control group. The VAS score was significantly lower in dexamethasone group after 210 min. "Halo" was present around the brachial plexus in all patients in both the groups. Trabelsi et al.[11] in their study found a significant prolongation of duration of analgesia with dexamethasone group (1110 min) compared to tramadol group (240 min). The limitation of the study is that small sample size was selected. We did not exclude the systemic effect of steroids. The VAS score was assessed only till 12 hours.

CONCLUSION

Dexamethasone is a beneficial in producing early onset and prolonged duration of analgesia to supraclavicular brachia plexus.

REFERENCES

1. Fletcher D, Kuhlman G, Samii K. Addition of fentanyl to 1.5% lidocaine does not increase the success of axillary plexus block. Reg Anesth 1994; 19(3):183–8.

2. Kardash K, Schools A, Concepcion M. Effects of brachial plexus fentanyl on supraclavicular block. A randomized, double-blind study. Reg Anesth 1995; 20(4):311-5.

3. Magistris L, Casati A, Albertin A, Deni F, Danelli G, Borghi B, et al. Combined sciatic-femoral nerve block with 0.75% ropivacaine: effects of adding a systemically inactive dose of fentanyl. Eur J Anaesthesiol 2000; 17(6):348-53.

4. Moharari R, Sadeghi J, Khajavi M, Davari M, Mojtahedzadeh M. Fentanyl supplement expedites the onset time of sensory and motor blocking in interscalene lidocaine anesthesia. Eur J Anaesthesiol 2010; 18(4):298–302.

5. Shrestha BR, Maharjan SK, Shrestha S, Gautam B, Thapa C, Thapa PB, Joshi MR. Comparative study between tramadol and dexamethasone as an admixture to bupivacaine in supraclavicular brachial plexus block. J Nepal Med Assoc. 2007; 46(168):158-64.

6. Chakraborty S, Chakrabarti J, Mandal MC, Hazra A, Das S. Effect of clonidine as adjuvant in bupivacaine-induced supraclavicular brachial plexus block: A randomized controlled trial. Indian J Pharmacol 2010; 42:74-7.

7. Parveen S, Athaluri VV, Lakshmi BS. Effect of intravenous dexamethasone in prolonging the duration of supraclavicular brachial plexus block with 0.5% ropivacaine: A prospective, randomized, placebo controlled study.IntJSci Study 2015; 2:56-60.

8. Estebe JP, Le Corre P, Clément R, Du Plessis L, Chevanne F, Le Verge R, et al. Effect of dexamethasone on motor brachial plexus block with bupivacaine and with bupivacaine-loaded microspheres in a sheep model.EurJAnaesthesiol2003;20:305-10.

9. Deepraj Singh Bais, Geetha C, Amisha Kawale. "Effectiveness of Addition of Dexamethasone to 0.5% Ropivacaine in Providing Perioperative Analgesia for Supra Clavicular Brachial Plexus Block". Journal of Evolution of Medical and Dental Sciences 2014;10: 2456-2464.

10. Alarasan AK, Agrawal J, Choudhary B, Melhotra A, Uike S, Mukherji A. Effect of dexamethasone in low volume supraclavicular brachial plexus block: A double-blinded randomized clinical study. J Anaesthesiol Clin Pharmacol 2016; 32:234-9.

11. Trabelsi W, Lebbi A, Romdhani C, Naas I, Sammoud W, Elaskri H, et al. Dexamethasone provides longer analgesia than Tramadol when added to Lidocaine after ultrasound guided supraclavicular brachial plexus block. A randomized, controlled, double blinded study. Analg Resusc 2013; 2:2.

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