



## USE OF DEXMEDETOMIDINE AS ADJUVANT TO BUPIVACAINE FOR SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK

**Dr. Anand Yadav**

Senior Resident, Department Of Anaesthesiology, R.D. Gardi Medical College, Ujjain, M.P., India

**Dr. Pranjalee Verma**

Jaiprakash District Hospital, Bhopal, M.P., India

### ABSTRACT

**Background:** Brachial plexus block is a widely used technique for upper limb surgeries. Bupivacaine, a long-acting local anesthetic, is commonly used for such blocks. Dexmedetomidine, an  $\alpha$ -2 adrenergic agonist, has been studied as an adjuvant to local anesthetics to enhance block characteristics. **Objectives:** To evaluate the effect of adding dexmedetomidine to 0.5% bupivacaine on onset, duration, and quality of supraclavicular brachial plexus block, and on hemodynamic stability and complications. **Methods:** A randomized, double-blind study was conducted on 50 ASA I and II patients scheduled for upper limb surgeries. Group A received 38 ml of 0.5% bupivacaine and Group B received the same with 30  $\mu$ g dexmedetomidine. Sensory and motor block onset, duration, postoperative analgesia, hemodynamic changes and complications were recorded. **Results:** Group B showed significantly faster onset of sensory ( $17.0 \pm 0.9$  min) and motor block ( $19.8 \pm 0.9$  min), longer duration of sensory ( $875.2 \pm 144.8$  min) and motor block ( $939.2 \pm 151.2$  min), and prolonged analgesia ( $938 \pm 141.6$  min) compared to Group A. Heart rate and systolic blood pressure were lower in Group B but remained within acceptable clinical limits. **Conclusion:** Dexmedetomidine as an adjuvant to bupivacaine enhances the efficacy of supraclavicular brachial plexus block with better analgesia and hemodynamic stability without major side effects.

**KEYWORDS :** Dexmedetomidine, Bupivacaine, Supraclavicular Brachial Plexus Block, Regional Anesthesia, Postoperative Analgesia

### INTRODUCTION

The supraclavicular brachial plexus block is a frequently employed technique in upper limb surgeries, providing effective surgical anesthesia and postoperative analgesia. Bupivacaine, a long-acting local anesthetic, is widely used in this block due to its favorable sensory and motor blocking characteristics. Recent advancements suggest that combining local anesthetics with adjuvants like  $\alpha$ -2 agonists can significantly enhance the block's efficacy and duration. Dexmedetomidine, a potent and highly selective  $\alpha$ -2 adrenoceptor agonist, has demonstrated sedative, analgesic, and sympatholytic properties. This study explores the impact of adding dexmedetomidine to bupivacaine in supraclavicular blocks, specifically focusing on onset, duration, hemodynamic changes, and side effects.

### MATERIALS AND METHODS

This randomized, double-blind observational study was conducted at R.D. Gardi Medical College and associated hospitals. Fifty ASA I and II patients aged 18-60 years undergoing upper limb surgery were enrolled. Patients were divided into two groups: Group A (bupivacaine 0.5%, 38 ml) and Group B (bupivacaine 0.5%, 38 ml + 30  $\mu$ g dexmedetomidine). Exclusion criteria included refusal, allergy, systemic diseases, pregnancy, and coagulation disorders.

Supraclavicular brachial plexus block was performed under aseptic precautions, using classical Kulenkampff's technique. Block success was assessed by onset and duration of sensory and motor block, using modified Bromage scale and VAS. Hemodynamic parameters (HR, SBP, DBP, SpO<sub>2</sub>) were recorded at multiple intervals. Postoperative analgesia was measured as the time to first rescue analgesic requirement.

### RESULTS

The mean onset of sensory block was faster in Group B ( $17.0 \pm 0.9$  min) compared to Group A ( $19.5 \pm 1.4$  min). Motor block onset was also faster in Group B ( $19.8 \pm 0.9$  min vs  $22.4 \pm 1.0$  min in Group A). The duration of sensory block ( $875.2 \pm 144.8$  min) and motor block ( $939.2 \pm 151.2$  min) was significantly longer in Group B compared to Group A ( $427.6 \pm 42.6$  min and  $342.0 \pm 37.1$  min, respectively). Postoperative analgesia lasted significantly longer in Group B

( $938.0 \pm 141.6$  min) than in Group A ( $490.0 \pm 47.9$  min). Group B also showed lower pulse rate and systolic blood pressure but remained within acceptable clinical limits.

### DISCUSSION

Dexmedetomidine, when used as an adjuvant to bupivacaine, enhances the onset and prolongs the duration of both sensory and motor block. The results are consistent with previous literature indicating the  $\alpha$ -2 agonist's ability to augment local anesthetic effects via peripheral and central mechanisms. The hemodynamic profile observed in this study was acceptable, with expected bradycardia and hypotension occurring without the need for significant intervention. Sedation scores indicated a comfortable and cooperative patient profile postoperatively.

### CONCLUSION

Addition of dexmedetomidine (30  $\mu$ g) to 0.5% bupivacaine for supraclavicular brachial plexus block significantly reduces the onset time, prolongs duration of sensory and motor block, and enhances postoperative analgesia with acceptable hemodynamic stability. Dexmedetomidine proves to be an effective and safe adjuvant to local anesthetics in regional anesthesia techniques.

### REFERENCES

- Swami SS, Keniya VM, Ladi SD, Rao R. Comparison of dexmedetomidine and clonidine ( $\alpha$ 2 agonist drugs) as an adjuvant to local anesthesia in supraclavicular brachial plexus block. Indian J Anaesth. 2012.
- Manohar P et al. A comparative study of bupivacaine with fentanyl and bupivacaine with dexmedetomidine in supraclavicular block. Int J Health Sci Res. 2015.
- Vorobeichik L, Brull R, Abdallah FW. Evidence basis for the use of perineural dexmedetomidine. Anesth Analg. 2017.