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Original Research Paper

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EFFECTIVENESS OF LEVOBUPIVACAINE IN SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Supraclavicular brachial plexus block is a well-established regional anesthetic technique for upper limb surgeries. Levobupivacaine, the S-enantiomer of bupivacaine, has shown reduced cardiotoxicity with effective anesthetic properties. **Aim:** To evaluate the clinical profile of 0.5% levobupivacaine in supraclavicular brachial plexus block in terms of block characteristics, analgesic duration, and safety profile. **Methods:** This prospective observational study included 25 ASA Grade I and II patients undergoing upper limb surgery. Patients received 0.4 ml/kg of 0.5% levobupivacaine via supraclavicular approach. Onset and duration of sensory and motor block, postoperative analgesia, and hemodynamic parameters were observed. Data were analyzed using descriptive statistics. **Results:** The mean onset of sensory and motor blocks was 7.16 ± 0.75 minutes and 8.92 ± 0.81 minutes, respectively. The mean duration of sensory block was 384.04 ± 4.26 minutes, and motor block was 413.88 ± 9.33 minutes. Mean duration of postoperative analgesia was 402.44 ± 10.31 minutes. Hemodynamic parameters remained stable, and no adverse events or complications were observed. **Conclusion:** Levobupivacaine offers effective anesthesia and prolonged analgesia with minimal side effects for upper limb surgeries using supraclavicular brachial plexus block. It is a safe alternative to racemic bupivacaine.

KEYWORDS : Levobupivacaine, Supraclavicular Block, Brachial Plexus, Regional Anesthesia, Analgesia

INTRODUCTION

Regional anesthesia techniques have revolutionized perioperative pain management. The supraclavicular brachial plexus block is favored for upper limb surgeries due to its rapid onset and consistent success.

Levobupivacaine is the S-enantiomer of bupivacaine, introduced to reduce the cardiovascular and neurotoxic side effects associated with the racemic mixture. It retains the anesthetic potency of bupivacaine while enhancing safety. This study aims to investigate the block characteristics, analgesic profile, and safety of levobupivacaine in the supraclavicular approach.

MATERIALS AND METHODS

Study Design: Prospective observational study
Sample Size: 25 patients
Study Site: Department of Anaesthesiology, C.R. Gardi Hospital, Ujjain

Inclusion Criteria:

- Age 20–60 years
- ASA Grade I or II
- Elective upper limb surgery

Exclusion Criteria:

- Patient refusal
- Allergy to study drugs
- Local infection at injection site
- Coagulopathy or anticoagulant therapy
- Systemic illness (cardiac, renal, hepatic)
- Pregnancy/lactation
- Neurological or psychiatric conditions

Procedure:

Patients underwent pre-anesthetic evaluation. After confirming fasting status, intravenous access was established, and baseline monitoring initiated. Using the supraclavicular approach, 0.4 ml/kg of 0.5% levobupivacaine was administered after eliciting paraesthesia.

Sensory block was assessed by pinprick using the Hollmen scale, and motor block by the Modified Bromage scale. VAS scores were used to assess postoperative pain. Rescue analgesia was administered at VAS ≥ 4.

Data Analysis:

All data were recorded in a predesigned proforma and analyzed using descriptive statistics. Mean and standard deviation were calculated for continuous variables.

RESULTS

Patient Demographics:

- Mean Age: 32.64 ± 12.59 years
- Mean Weight: 61.32 ± 7.03 kg
- Gender: 13 males (52%), 12 females (48%)
- ASA Grade I: 84%, Grade II: 16%

Block Characteristics:

Parameter	Mean ± SD
Onset of Sensory Block (min)	7.16 ± 0.75
Onset of Motor Block (min)	8.92 ± 0.81
Duration of Sensory Block (min)	384.04 ± 4.26
Duration of Motor Block (min)	413.88 ± 9.33
Duration of Analgesia (min)	402.44 ± 10.31

Hemodynamic Observations:

- Pulse and blood pressure showed transient elevation post-induction, returning to baseline without intervention.
- SpO2 and respiratory rate remained within normal limits.

Adverse Effects:

- No incidence of block failure, toxicity, or other complications was observed.

DISCUSSION

Levobupivacaine is increasingly recognized for its efficacy and safety in regional anesthesia. The observed onset and duration of sensory and motor blockade in our study align well with existing literature. It demonstrated satisfactory intraoperative anesthesia and extended postoperative analgesia.

Compared to racemic bupivacaine, levobupivacaine reduced the risk of systemic toxicity while offering equivalent anesthetic quality. Hemodynamic parameters remained stable, and the absence of complications highlights its favorable profile.

Our findings are consistent with studies by Deshpande et al., Jewalikar et al., and Dash et al., all of whom reported similar

efficacy and safety outcomes.

CONCLUSION

Levobupivacaine (0.5%, 0.4 ml/kg) administered via supraclavicular approach provides rapid onset and prolonged duration of both sensory and motor block, with effective postoperative analgesia and minimal side effects. It is a safe and efficient alternative to racemic bupivacaine for upper limb surgeries.

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