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A COMPARATIVE STUDY ON THE EFFICACY, SAFETY, AND RECOVERY PROFILES OF 0.5% ROPIVACAINE VERSUS 0.5% BUPIVACAINE IN SUPRAZYGOMATIC MAXILLARY NERVE BLOCK

Anaesthesiology

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KEYWORDS

INTRODUCTION:

Effective perioperative pain control is a cornerstone of anaesthetic management, especially in maxillofacial surgeries where regional nerve blocks can significantly improve patient comfort and surgical outcomes. The suprazygomatic maxillary nerve block (SMNB) has emerged as a preferred technique for providing targeted analgesia for midfacial procedures, such as fracture repairs, cleft surgeries and aesthetic interventions.

Bupivacaine, a commonly used long-acting local anaesthetic, is known for its extended duration of analgesia. Ropivacaine, a newer amide local anaesthetic structurally related to bupivacaine, offers similar sensory blockade but with a more favourable safety profile. It is associated with less motor blockade and reduced systemic toxicity, which may allow for quicker postoperative recovery.

Despite these promising attributes, there remains a scarcity of comparative studies evaluating the performance of ropivacaine versus bupivacaine in SMNB, particularly in paediatric patients.
Methodology:

Study Design:

This was a prospective, randomized, single-blinded clinical trial conducted at a tertiary care centre.

Sample Size:

The study enrolled a total of 12 patients, divided equally into two groups.

Groups:

- Group R received 0.5% ropivacaine
- Group B received 0.5% bupivacaine

Intervention:

The SMNB was performed using anatomical landmarks under aseptic conditions. A 22G needle was introduced perpendicularly to the skin below the zygomatic arch, anterior to the mandibular condyle. Following negative aspiration, 5 ml of the assigned anaesthetic solution was slowly administered.

Outcome Measures:

- Primary Outcomes:
- Onset time of sensory block
- Duration of analgesia
- Secondary Outcomes:
- Visual Analog Scale (VAS) pain scores during and after surgery at predefined intervals (1, 2, 4, 6, 12, and 24 hours)
- Frequency of adverse effects such as bradycardia, hypotension, and signs of systemic toxicity
- Time to sensory recovery
- Patient satisfaction assessed via a structured questionnaire at 24 hours

RESULTS:

Demographics:

Both groups were comparable with respect to age, gender, weight, and surgical type ($p > 0.05$).

Block Characteristics:

- Sensory block onset was faster in the ropivacaine group (6.2 ± 1.3 minutes) compared to the bupivacaine group (7.8 ± 1.5 minutes, $p < 0.001$).
- Analgesia duration was longer in the bupivacaine group (750 ± 90 minutes) than in the ropivacaine group (680 ± 85 minutes, $p = 0.01$).

Pain Scores (VAS):

Both groups exhibited low VAS scores intraoperatively and within the first 6 hours postoperatively. After 6 hours, Group B showed slightly lower pain scores, consistent with longer analgesia duration.

Adverse Events:

Adverse effects were minimal in both groups.

Recovery Profile:

Group R demonstrated quicker sensory recovery (730 ± 80 minutes vs. 800 ± 90 minutes, $p = 0.02$). Satisfaction levels were similar in both groups.

DISCUSSION:

The findings confirm that both ropivacaine and bupivacaine provide effective anesthesia via SMNB. Ropivacaine's faster onset and shorter recovery period are beneficial in procedures demanding quick turnaround and discharge. Bupivacaine's longer analgesic effect, on the other hand, may be advantageous in managing prolonged postoperative pain.

Limitations of this study include its single-center nature, limited sample size, and reliance on subjective pain assessments. Larger, multicenter trials with objective evaluations are recommended to further substantiate these results.

CONCLUSION:

Both 0.5% ropivacaine and 0.5% bupivacaine are effective choices for SMNB in paediatric maxillofacial surgeries. Ropivacaine offers quicker onset and recovery with a safer profile, making it preferable in short-duration surgeries and outpatient settings. The selection of anaesthetic should be tailored to the specific clinical scenario, balancing duration of analgesia with safety and recovery considerations.