Abstract

Introduction: The aim of this study was to compare Ropivacaine 0.2% to Bupivacaine 0.25% for parascalene brachial plexus block (PBPB) in children.

Material and Methods: The study protocol was approved by the local committee of ethics and all parents gave written informed consent before enrolment. We performed a prospective, randomized, double-blind trial including children aged between 2 and 13 years, scheduled for a shoulder, arm or elbow surgery. General anaesthesia was standardized: sevoflurane inhalation induction, maintenance with isoflurane 1 MAC. The PBPB was performed after randomization in two groups: RG (Ropivacaine 0.2 %; 0.5 ml.kg\(^{-1}\)) and BG (Bupivacaine 0.25 %; 0.5 ml.kg\(^{-1}\)). In case of failure of the block, the child was excluded from the study. CHEOPS score was noted on the recovery then 1, 2, 3, 4, 6, 9, 12 and 24 hours after surgery. If CHEOPS score ≥ 7, the child received 15 mg.kg\(^{-1}\) of paracetamol and if insufficient, a second dose of paracetamol was administrated by intravenous route. The time to first requirement and the total doses of analgesic given were recorded. Heart rate (HR) and mean arterial blood pressure (MABP) were collected at baseline, after performing PBPB, at skin incision, and then every 10 minutes until the end of surgery. Chi-square and Students t-test were used in statistical analysis; p ≤ 0.05 was considered significant.

Results: Sixty patients were included (RG=30, BG=30). Three children were excluded. Data of 57 patients were analyzed (RG=27; BG=30). The two groups were comparable as regards demographic data, kind and duration of surgery. CHEOPS score was similar between the two groups during the first 24 postoperative hours. 8 children in RG versus 9 in BG required complementary analgesics during the first 24 hours. There was no significant difference between the groups concerning time to first analgesic requirement. Intraoperative HR and MABP were comparable between the two groups and there was no significant difference concerning motor block duration.

Conclusion: Ropivacaine 0.2% seems to be as effective as bupivacaine 0.25% for PBPB in children undergoing shoulder, arm and elbow surgery.

Background

- Ropivacaine is an aminoamide local anesthetic which in adults appears to cause less motor block and less cardiotoxicity than bupivacaine but produces a similar duration of analgesia.
- The use of ropivacaine has been studied in children for caudal (1), epidural and some peripheral nerve blocks (2), but not for parascalene brachial plexus block.

Objective

The aim of this study was to compare Ropivacaine 0.2% to Bupivacaine 0.25% for parascalene brachial plexus block (PBPB) in children.

Material and Methods

- Study design: a prospective, randomized, double-blind trial.
- Inclusion criteria: children aged between 2 and 13 years, scheduled for a shoulder, arm or elbow surgery.
- Protocol management:
  - Standardized general anesthesia: sevoflurane inhalation induction, maintenance with isoflurane 1 MAC.
  - The PBPB was performed using the approach described by Dalens (3).
  - Randomization in two groups: RG (Ropivacaine 0.2 %; 0.5 ml.kg\(^{-1}\)) and BG (Bupivacaine 0.25 %; 0.5 ml.kg\(^{-1}\)).
- An increase in heart rate greater than 20% on skin incision or during the surgery was interpreted as block failure, fentanyl was administered and the child was excluded from the study.
- Post-operative period: CHEOPS score was noted on the recovery then 1, 2, 3, 4, 6, 9, 12 and 24 hours after surgery. If CHEOPS score ≥ 7, the child received 15 mg.kg\(^{-1}\) of paracetamol and if insufficient, a second dose of paracetamol was administrated by intravenous route.

- Primary outcome measure:
  - Postoperative analgesia: assessed by The time to first requirement and the total doses of analgesic given
  - Secondary outcome measures:
    - Intraoperative analgesia: evaluated by Heart rate (HR) and mean arterial blood pressure (MABP), collected at baseline, after performing PBPB, at skin incision, and then every 10 minutes until the end of surgery.
    - Motor block duration

- Statistical analysis: Chi-square and Students t-test were used; p ≤ 0.05 was considered significant.

Results

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<thead>
<tr>
<th>Table 1: Demographic data</th>
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<tr>
<td>Age (months)</td>
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<tr>
<td>Sex-ratio</td>
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<td>Weight (kg)</td>
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<td>Duration of surgery (min)</td>
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References