

Comparing Pain Management Techniques In Children Undergoing Primary Palatoplasty: A Prospective Study

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Introduction

Administering opioids to infants raises concerns about postoperative sedation, respiratory depression, and airway compromise, especially for children undergoing a primary palatoplasty.

There remains no clear consensus on the most effective method compared to the traditional practice of infiltrating the surgical site with local anesthetic.

This study evaluates whether local palatal infiltration is as effective as suprazygomatic maxillary nerve block (SMB) in minimizing postoperative pain, optimizing postoperative feeding, and expediting hospital discharge in patients undergoing primary palatoplasty.

Methods

Participants were recruited from Ann & Robert H. Lurie Children's Hospital, and our cohort included all patients between the ages of 2 months and 36 months undergoing primary cleft palate repair.

Eligible participants were randomly assigned to receive one of the following interventions: local infiltration of the palate or an ultrasound-guided bilateral suprazygomatic maxillary nerve block (SMB) (Figure 1).

Hospital staff monitored pain levels every 4 hours using the Face, Legs, Activity, Cry, Consolability (FLACC) score and retrospective review was done.

Intraoperative and postoperative opioid medication administration were calculated and converted to total milligrams of oral morphine equivalent (OME) for standardized comparison (Table 1).

Table 1. Opioid Equivalence Factors ¹

Opioids	Route	Unit	Conversion Factor	OME
Fentanyl	IV	mcg	300	300 mcg / 0.3 mg
Hydromorphone	IV	mg	18	18 mg
Hydrocodone	PO	mg	1	1 mg
Oxycodone	PO	mg	1.5	1.5 mg
Codeine	PO	mg	0.15	0.15 mg

Pearson's chi-squared tests and Two-tailed t-tests were used to assess study outcomes

Results

Figure 1. Distribution of Veau classification among randomized patients who received local palatal infiltration versus suprazygomatic maxillary nerve block (SMB).

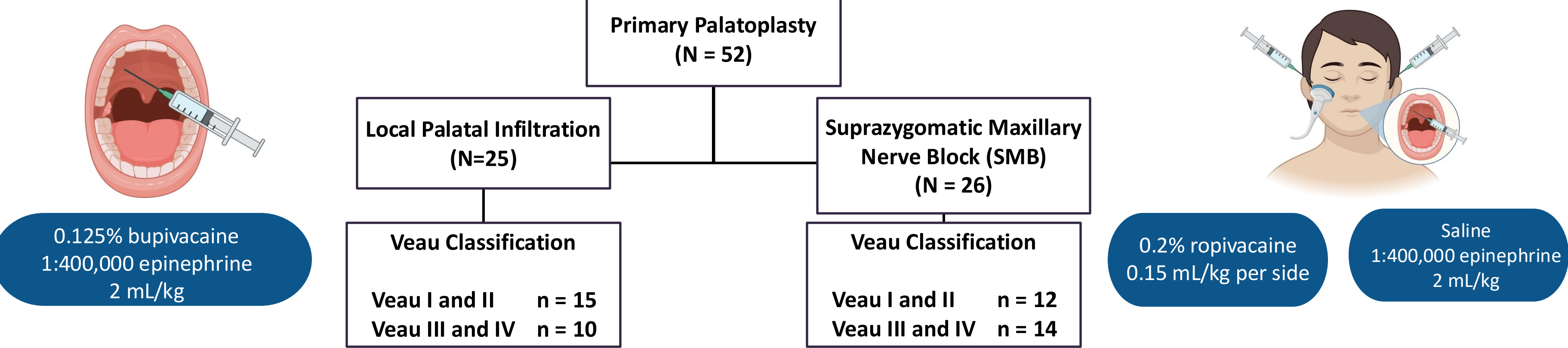


Figure 2. Total and weight-based opioid administration in overall cohort (N=51) in local palatal infiltration versus SMB. Significant findings are highlighted with p*<0.05 and p**<0.005.

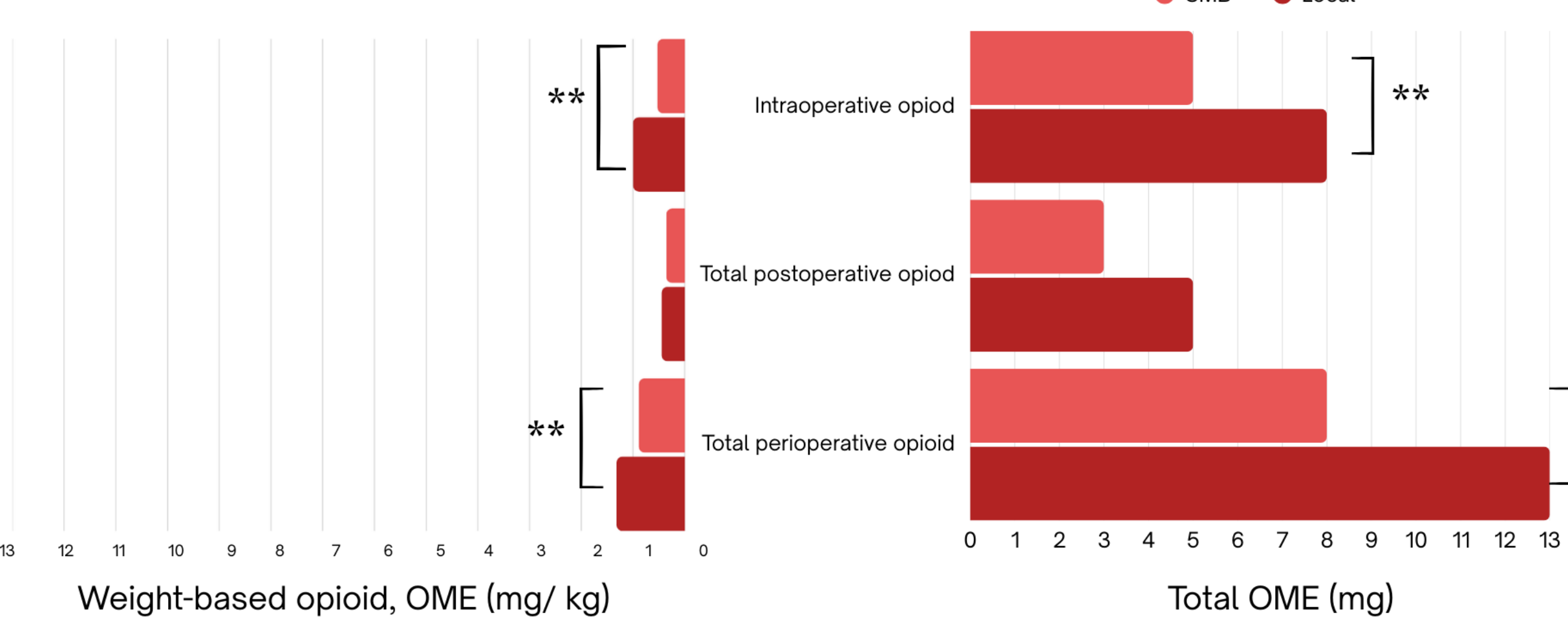


Table 2. Clinical variables and study outcomes in local palatal infiltration cohort and suprazygomatic maxillary nerve block (SMB) cohort.

Variable	Overall (N=51)	Local (N=25)	SMB (N=26)	P-value
Age (months)	12.6	12.9	12.3	0.48
Weight (kg)	10.4	12.0	8.9	0.22
BMI (kg/m ²)	17.1	17.5	16.8	0.15
Anesthesia time (minutes)	269.3	247.8	270.4	0.13
Length of stay (hours)	32.24	31.0	33.4	0.51
Estimated blood loss (mL)	19.7	18.4	21.0	0.36
Intraoperative acetaminophen (mg)	113.4	124.0	103.2	0.04
Total perioperative acetaminophen (mg)	419.7	442.4	397.8	0.59
Total postoperative hydrocodone/acetaminophen OME (mg)	2.3	2.6	2.0	0.39
Total postoperative ibuprofen (mg)	226.8	199.2	253.3	0.29
Time to first PO intake (min)	370.67	355.36	386.71	0.82
Total inpatient PO intake (mL)	250.13	226.77	272.48	0.45

Figure 3. Total and weight-based opioid administration in Veau III and IV patients (N=24) in the local palatal infiltration (N=10) cohort versus SMB cohort (N=14). Significant findings are highlighted with p*<0.05 and p**<0.005. ²

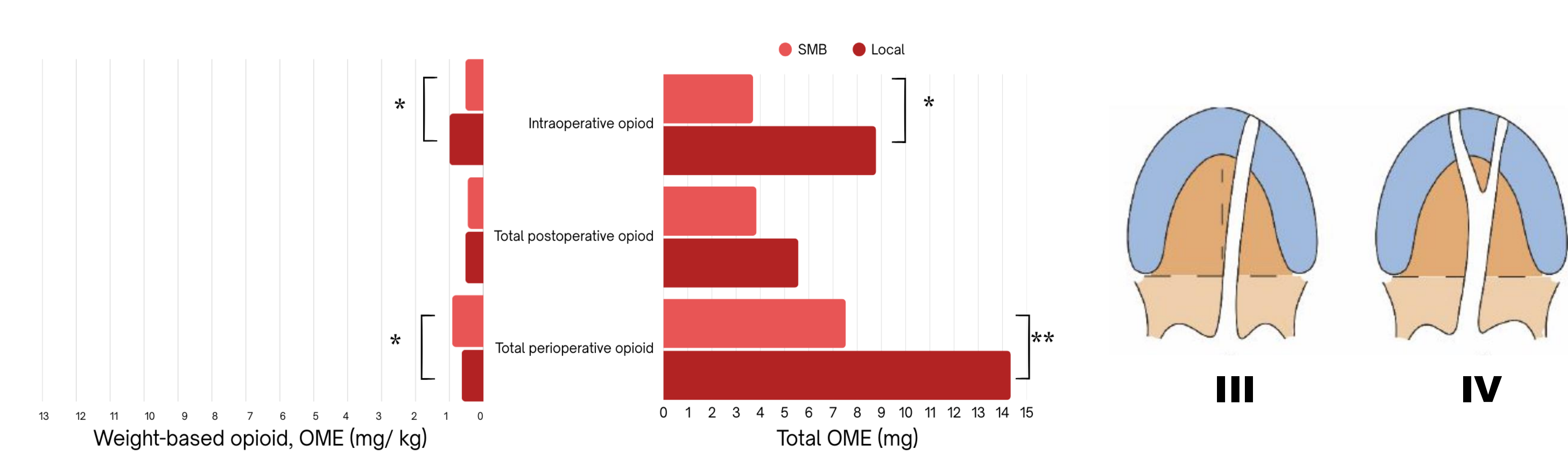
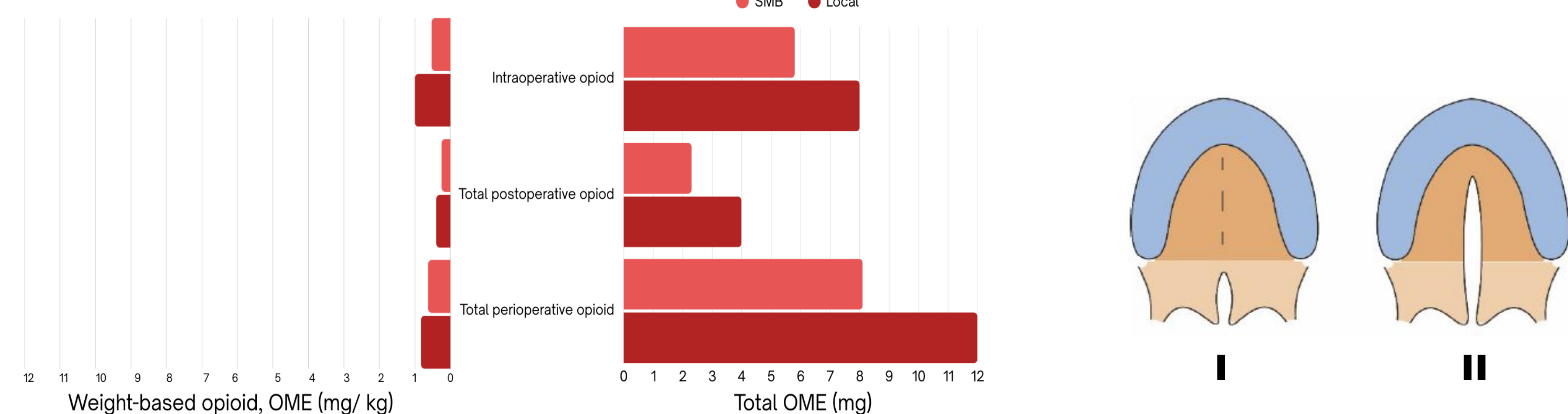


Figure 4. Total and weight-based opioid administration in Veau I and II patients (N=27) in local palatal infiltration (N=15) versus SMB (N=12). There were no significant findings between the cohorts. ²



Conclusions

The SMB was notably associated with reduced perioperative opioid requirements compared to local palatal infiltration, even when accounting for weight.

Utilization of SMB block may be especially beneficial for patients with more severe cleft palate (i.e., Veau III and IV), as targeting the nerve supplying the hard palate is more effective than using an analgesic that only targets the soft tissue of the cleft palate.

Based on our findings, we recommend that SMB be prioritized in hospitals with the appropriate resources to administer this modality, especially for patients with cleft palate classified as Veau III and IV.

References

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