

IMPORTANCE

- Opioid-sparing or multimodal analgesia (MMA) has been a topic of interest due to the opioid epidemic in the United States. Efforts are being made to clinically test multimodal pain regimens in complex head and neck (H&N) procedures with hopes to reduce the need for narcotic pain medication in the perioperative period.

OBJECTIVE

- To determine if the use of a novel MMA regimen that include acetaminophen, gabapentin, ketorolac, and a donor-site regional nerve block in otolaryngologic H&N free tissue reconstructive procedures will significantly reduce (>25% difference) in morphine milligram equivalents (MMEs), or obviate the need for opioid usage.

DESIGN, SETTING, AND PARTICIPANTS

- Prospective cohort study assessing a sample of 20 patients undergoing a H&N free tissue reconstructive surgery at a single tertiary academic referral center from December 2019-July 2020.
- Three cohorts were observed:
 - Control Group (n=7)
 - MMA Group (n=7)
 - Block Group (n=6)

Characteristics	Participants (n=20)
Age, years (mean±SD)	66.6 ± 12.7
Male sex, n (%)	12 (60)
Opioid naïve, n (%)	18 (90)

Table 1. Baseline demographics.

INTERVENTIONS

Analgesia Regimen	Control Group (n=7)	MMA Group (n=7)	Block Group (n=6)
Scheduled	▪ Acetaminophen 650 mg	▪ Acetaminophen 650 mg ▪ Gabapentin ▪ Ketorolac 15 mg Q6H x 5 days (starting POD #1) ▪ Bupivacaine regional nerve block x 3 days	▪ Acetaminophen 650 mg ▪ Bupivacaine regional nerve block x 3 days
As needed	▪ Oxycodone 5 mg ▪ IV Morphine 2 mg	▪ Oxycodone 5 mg ▪ IV Morphine 2 mg	▪ Oxycodone 5 mg ▪ IV Morphine 2 mg

Table 2. Analgesia regimen for three cohorts—Control, MMA, and Block Groups. Listed are both scheduled and as needed medications available postoperatively. MMA = multimodal analgesia, POD = postoperative day, Q6H = every 6 hours, IV=intravenous

MAIN OUTCOMES AND MEASURES

- The primary outcome was morphine milligram equivalents (MMEs) in the first 72 hours postoperatively. A difference of >30% of MMEs was determined to be clinically significant.
- Secondary outcomes include length of stay (LOS) and postoperative complications.

RESULTS

Outcome	Control Group (n=7)	Block Group (n=6)	MMA Group (n=7)
Primary outcomes			
MMEs, (mean ±SD) 0-72 hrs	103.6 ± 62.9	157.8 ± 75	63.4 ± 44.8
MMEs, median, 0-72 hrs	93	158.5	70
IQR	28.5-141	52.5-175	7.5-111
Secondary outcomes			
LOS, days (mean±SD)	8.3 ± 1.2	11.8 ± 4.2	7.7 ± 0.6
Median	8	12	8

Table 3. Primary and secondary outcome measures.

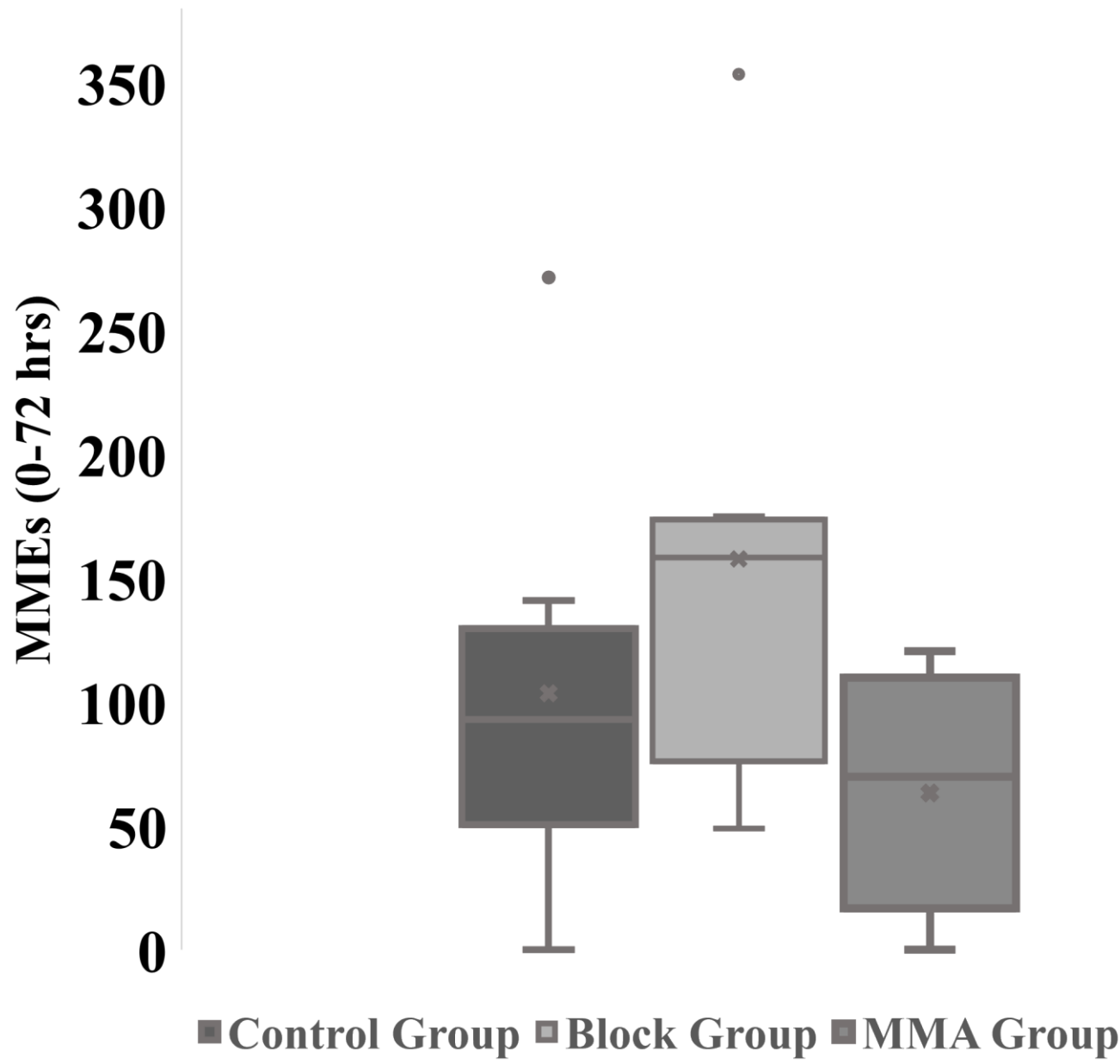


Figure 1. Morphine milligram equivalents (MMEs) in the first 72 hours postoperatively for each of the three groups. Box plots: the box marks out the 25th to 75th percentiles; the line within the box marks the median; ‘x’ denotes the mean; and outliers are represented as dots.

RESULTS (CONT.)

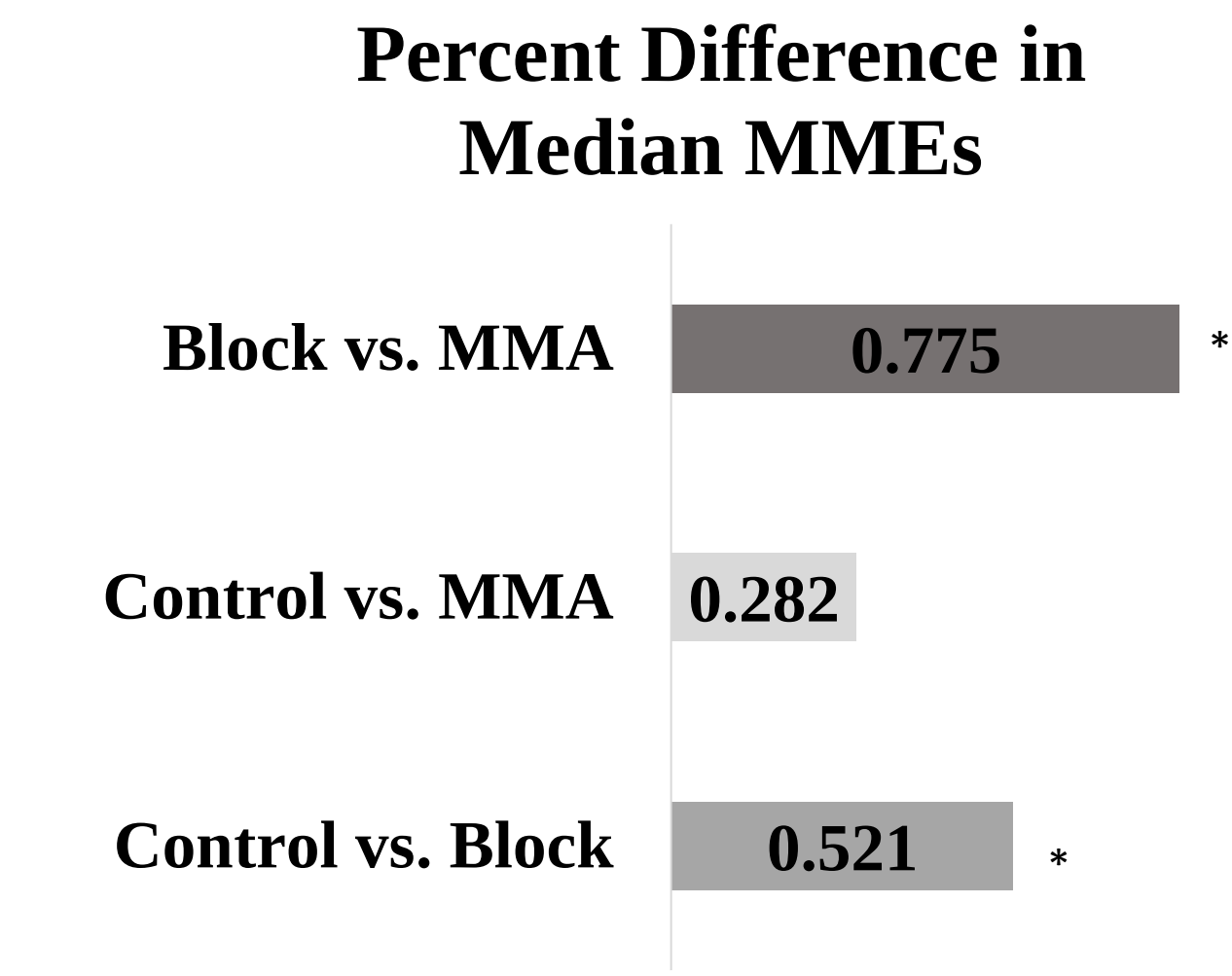


Figure 2. Percent difference in median MMEs when comparing different groups. *=indicates clinically significant (>30%)

- There were lower MMEs (28.2%), though not significantly, in the first 72 hours postoperatively when comparing the MMA group (median 70 mg, IQR 7.5-111 mg) to the control (median 93 mg, IQR 28.5-141 mg).
- There was a significantly lower MMEs (77.5%) when comparing the MMA group to the regional block only group (median 158.5 mg, IQR: 52.5-175 mg).
- Using the Mann-Whitney U-test, there was no difference in median LOS between the MMA and control cohorts (8 days, p=0.569).
- There was an increase, though not statistically significant, in median LOS between the MMA and regional block only cohort (8 days vs. 12 days, p=0.197). The increased LOS in the regional block cohort was unrelated to pain.
- There were no adverse events related to the regional block or gabapentin.
- Further there were no cases of bleeding or hematoma seen in ketorolac administration in our MMA cohort, though one patient (5%) experienced acute kidney failure which resolved without complication.

CONCLUSION AND RELEVANCE

- The findings are suggestive that this novel multimodal analgesia regimen may be clinically effective in reducing opioid usage in the perioperative period for head and neck free tissue reconstructive surgeries. Though further studies are needed, regional blocks alone appear to be a safe addition to a MMA regimen, but may not be as effective without the addition of gabapentin and ketorolac.

REFERENCES

1. Zhang X, Changfu S, Xiofeng B, Qian Z. Efficacy and safety of lower extremity nerve blocks for postoperative analgesia at free fibular donor sites *Head and Neck*. 2018; (40) 2670-2676. 2. Dort JC, Farwell DG, Findlay M, et al. Optimal Perioperative Care in Major Head and Neck Cancer Surgery With Free Flap Reconstruction: A Consensus Review and Recommendations From the Enhanced Recovery After Surgery Society. *JAMA otolaryngology-- head & neck surgery*. 2017;143(3):292-303. 3. Kelly MA. Current Postoperative Pain Management Protocols Contribute to the Opioid Epidemic in the United States. *American journal of orthopedics (Belle Mead, NJ)*. 2015;44(10 Suppl):S5-8. 4. Wick EC, Grant MC, Wu CL. Postoperative Multimodal Analgesia Pain Management With Nonopioid Analgesics and Techniques: A Review. *JAMA surgery*. 2017;152(7):691-697. 5. Townsend M, Liou T, Kallogjeri D, et al. Effect of Perioperative Gabapentin Use on Postsurgical Pain in Patients Undergoing Head and Neck Mucosal Surgery: A Randomized Clinical Trial. *JAMA otolaryngology-- head & neck surgery*. 2018. 6. Moeller C, Pawlowski J, Pappas AL, Fargo K, Welch K. The safety and efficacy of intravenous ketorolac in patients undergoing primary endoscopic sinus surgery: a randomized, double-blinded clinical trial. *International forum of allergy & rhinology*. 2012;2(4):342-347. 7. De Oliveira GS, Jr., Agarwal D, Benzon HT. Perioperative single dose ketorolac to prevent postoperative pain: a meta-analysis of randomized trials. *Anesthesia and analgesia*. 2012;114(2):424-433. 8. Gobble RM, Hoang HL, Kachniarz B, Orgill DP. Ketorolac does not increase perioperative bleeding: a meta-analysis of randomized controlled trials. *Plastic and reconstructive surgery*. 2014;133(3):741-755.

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