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Safety/QA/QI Projects

Multidisciplinary use of intravenous lidocaine in the perioperative setting at a tertiary pediatric hospital

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Introduction

Lidocaine is an amide local anesthetic that binds fast voltage gated sodium channels non-competitively. It exerts an analgesic, anti-inflammatory and anti-hyperalgesic effect. Studies have shown that lidocaine may play a role in neuromodulation, multimodal pain management, and Enhanced Recovery after Surgery (ERAS) protocols. Studies in adult patients showed decrease pain scores, intensity, and opioid consumption for abdominal surgeries and spine surgeries. It has also been shown to reduce the incidences of post-operative nausea and vomiting as well as facilitate earlier return of bowel function. Studies of intravenous lidocaine are limited in pediatric patients, but it has been employed in certain perioperative conditions with significant outcomes. At our institution, we have incorporated intravenous lidocaine infusions (IVLI) as an off label use in the perioperative management of multiple surgical disciplines with promising results. Of note, the off label use of IVLI in pediatric patients undergoing sleeve gastrectomies and for supracondylar fractures have shown a reduction in pain scores, opioid use, and antiemetic use at our institution with no known side effects or complications. Thus far, we have incorporated the use of IVLI in protocols for patients undergoing laparoscopic sleeve gastrectomies, repair of supracondylar fractures, posterior spinal fusion, and breast reduction surgeries.

Materials and Methods

The use of IVLI at our institution in perioperative protocols began in 2020. We first incorporated IVLI in patients who were undergoing sleeve gastrectomies for weight loss management. IV lidocaine is used in conjunction with quadratus lumborum blocks in this patient population to reduce pain scores and mitigate opioid use and associated side effects such as nausea and vomiting. After obtaining IRB approval (#1839350), a retrospective study was performed on patients who underwent laparoscopic sleeve gastrectomies between 9/2020-8/2023. Postoperative narcotic and rescue anti-emetic use, pain scores, time to oral intake, post-anesthesia care unit LOS, and HLOS were obtained and analyzed.

The incorporation of IVLI in patients undergoing supracondylar fractures began in 2023. After obtaining IRB approval (2116987) a restrospective study was performed on patients who underwent surgery for supracondylar fracture from August 2023 to May 2024. Data points collected and analyzed included procedural length, demographics, perioperative opioid use and pain scores.

To date, we have added IVLI to our posterior spinal fusion protocol as well as breast reduction protocol as a part of our multimodal pain management regimen. A retrospective study and data analysis are pending IRB approval for this

cohort.

Results/Case Report

The initial retrospective data for patients who underwent laparoscopic sleeve gastrectomies showed a significant decrease in post-operative antiemetic use and subsequent data showed a decrease in post-operative pain scores, and narcotic requirements.

Preliminary results for patients who underwent surgery for supracondylar fracturs have also shown a significant reduction in intraoperative and total opioid requirements in patients who received IVLI.

Discussion

IVLI have been shown to be an effective and safe adjunct to a multimodal pain regimen during the perioperative period. Given the opioid epidemic, the importance of multimodal pain management and attempts to decrease opioid use is a significant factor when it comes to providing a safe anesthetic care and pain management to our patients. The incorporation of IVLI in perioperative guidelines at our institution have shown promising results of safety and efficacy in pediatric patients undergoing specific surgeries. Further studies with larger cohorts are needed to assess the true efficacy of these infusions at decreasing perioperative opioid requirements but the preliminary results are promising.

References

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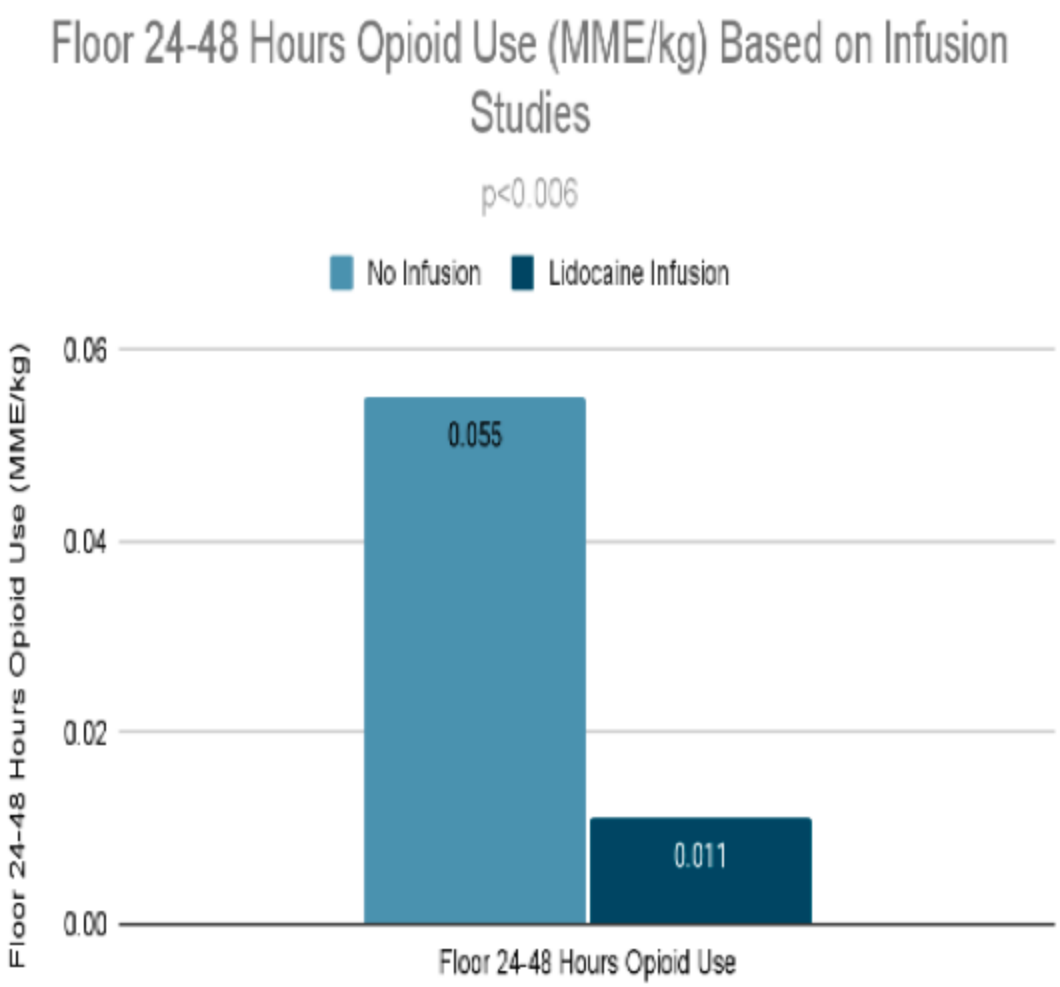
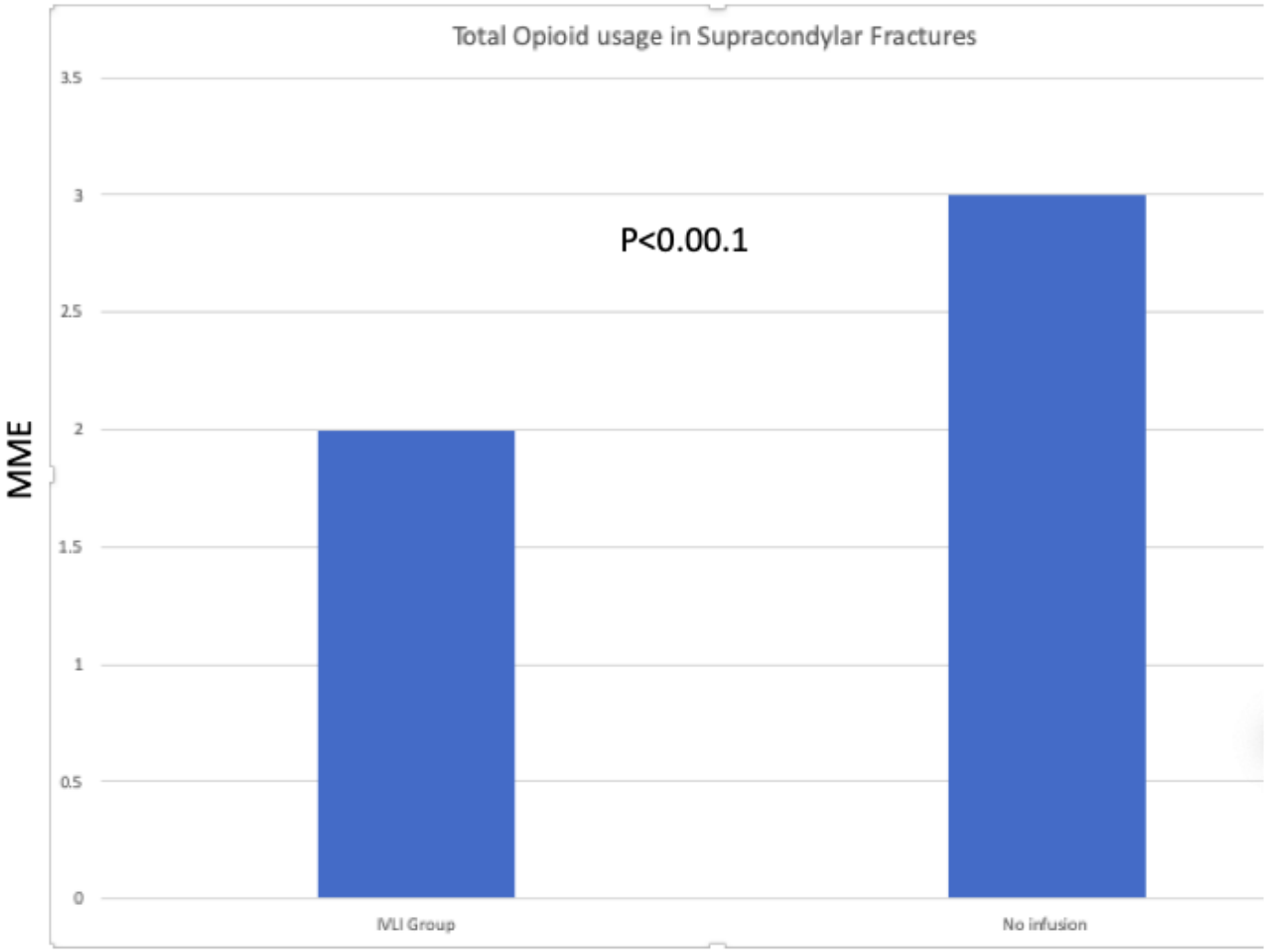
Disclosures

No

Tables / Images


Floor 24-48 Hours Opioid Use (MME/kg) Based on Infusion Studies
p<0.006
No Infusion
Lidocaine Infusion
Floor 24-48 Hours Opioid Use (MME/kg)
0.06
0.04
0.02
0.00
0.055
0.011
Floor 24-48 Hours Opioid Use


Total Opioid usage in Supracondylar Fractures
MME
3.5
3
2.5
2
1.5
1
0.5
0
P<0.00.1
IVLI Group
No infusion