Weight-Based Lidocaine Dosing Decreases Propofol Dose Required for Esophagogastroduodenoscopy Procedures

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Abstract

Propofol is the most used agent to provide anesthesia for esophagoduodenoscopy (EGD) procedures. Side effects of propofol include pain on injection, hypotension, and apnea/upper airway obstruction (Hu et al., 2022). A small dose of lidocaine is commonly administered to prevent pain on propofol injection. However, lidocaine has sedative and analgesic properties of its own, and administering a 1.5 mg/kg dose of lidocaine reduces the induction dose and total dose of propofol required for EGDs.

The following PICO question was used: (P) Do adult patients undergoing propofol-based sedation EGD procedures, (I) that receive a 1.5mg/kg lidocaine bolus, (C) compared to those that receive less than 1.5mg/kg of lidocaine, (O) require less propofol?

Introduction

In clinical experience at a community hospital in northeast Texas, for an EGD procedure, the dosing of lidocaine prior to propofol administration was observed to be 1mg/kg or less. Administering 1.5 mg/kg of lidocaine with propofol sedation has been demonstrated to reduce adverse events associated with propofol sedation, including apnea and hemodynamic instability, by reducing the required dose of propofol needed to achieve an adequate level of sedation (Liu et al., 2021).

Therefore, at this clinical site there is an opportunity to increase lidocaine dosing for EGD procedures and decrease the incidence of adverse events related to propofol sedation. This project intends to investigate if adult patients undergoing propofol-based sedation EGD procedures who receive 1.5mg/kg of lidocaine compared to those who receive less than 1.5mg/kg of lidocaine will require less propofol.

Methods

- Educational flyers were used to communicate to anesthesia providers the benefits of administering an intravenous lidocaine bolus of 1.5 mg/kg to reduce the induction dose and total dose of propofol required for EGDs.
- Flyers were posted on or near medication storage devices and in the anesthesia lounge room on 16 October 2024.
- On 30 October 2024, a survey was distributed to anesthesia practitioners after the educational material had been posted for four weeks.
- The survey assessed the effectiveness of the educational material at encouraging anesthesia personnel to institute the lidocaine dosing recommendations

Participants

12 full-time CRNAs

Results

Out of twelve full-time CRNAs at a community hospital in northeast Texas, seven responses to the post-intervention survey were received, representing a 58% completion rate. Six of these seven responses (85.71%) reported trying the weight-based lidocaine dosing for EGDs after reading the educational flyer. Survey results revealed:

- 85.71% of participants agreed their anesthetic practice was improved with this practice change
- 85.71% of participants agreed they were able to use less propofol than expected with this lidocaine dose
- 100% of participants agreed they will adapt this change into their future practice
- One respondent did not participate due to practice change adopted prior to this project

Discussion

The experiences of the CRNAs that adopted this practice change agreed with the findings in the literature. The majority of CRNAs (85.71%) that used this practice change agreed that they were able to use less propofol than anticipated. This mirrors the findings of Arun et al. 2022, Liu et al. 2021, Qi et al. 2022, and Tang et al. 2024.

Most respondents (85.71%) also indicated that with the practice change, the anesthetic was improved in terms of "fewer episodes of apnea, greater hemodynamic stability, less gagging on probe insertion, etc." This matches the decreased number of adverse events found in the literature (Arun et al. 2022, Qi et al. 2022, and Tang et al. 2024).

The fact that respondents saw an improved anesthetic with less propofol used when increasing their lidocaine dose from their previously dosing to a 1.5 mg/kg dose shows the clinical relevancy of this practice change.

Conclusions

- All survey respondents indicated that they would be continue to use the 1.5 mg/kg lidocaine dosing for EGDs, indicating this intervention was successful
- Using less propofol and experiencing fewer adverse events will increase patient safety and provide anesthesia providers and EGD proceduralists with smoother cases

References

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