

Drug Utilization Pattern of Pre-Anesthetic Medications in Surgical Procedures: An Institutional Based Study

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ABSTRACT

Background: The scarcity of trained anesthesia providers in LMICs, coupled with insufficient training and oversight, poses a considerable challenge. Nevertheless, enhancements in monitoring techniques, along with greater access to medications and screened blood products, have significantly improved the safety and efficacy of anesthesia practices. The present study was conducted for drug utilization pattern of pre-anesthetic medications in surgical procedures.

Materials and Methods: The study prospectively investigated pre-anesthetic medication use in patients of all ages and genders undergoing surgeries with general anesthesia. Over six months, prescribing practices, patient demographics, surgical reasons, and medication details were meticulously documented and analyzed using Excel and SPSS software.

Results: The study evaluated 100 patients who underwent various surgical procedures, with the most common being Carcinoma/Tumor (23%), Perforation peritonitis (18%), and Intestinal obstruction (15%). Other surgeries performed included Lower segment caesarean section (12%), Appendix perforation (10%), Chronic suppurative otitis media (8%), and Blunt trauma to abdomen (8%). In terms of pre-anesthetic medication, Ondansetron was prescribed to 97% of patients, followed by Midazolam (95%), Pentazocine (89%), Atropine/

glycopyrrolate (81%), Fentanyl (23%), and Ranitidine + Metoclopramide, which was administered to all patients (100%).

Conclusion: The primary pre-anesthetic agents used in major surgeries are ondansetron, midazolam, and pentazocine. Moreover, fentanyl is often used as a pre-anesthetic medication in cancer patients undergoing surgery.

Key words: Pre-anesthetic, Medications; Ondansetron; Midazolam; Pentazocine; Atropine.

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INTRODUCTION

Historically, the significance of safe anesthesia in influencing surgical outcomes has often been overlooked. Since the 1950s, with the evolution of surgical methodologies, there has been a growing emphasis on enhancing patient safety and surgical results; in high-income countries (HICs), anesthesia providers have been acknowledged as vital components of surgical teams. Conversely, low- and middle-income countries (LMICs), which face the most significant surgical demands, have struggled to implement the advancements in anesthesia care and monitoring that have been successfully adopted in HICs.¹⁻³ The scarcity of trained anesthesia providers in LMICs, coupled with insufficient training and oversight, poses a considerable challenge. Nevertheless, enhancements in monitoring techniques, along with greater access to medications and screened blood products, have significantly improved the safety and efficacy of anesthesia

practices. These advancements have been supported by a foundation of professional education, clinical excellence, and adherence to professional standards. However, it is important to note that innovations in safety have not consistently been developed through rigorous assessments of their efficacy and cost-effectiveness.⁴⁻⁶ Hence; present study was conducted for drug utilization pattern of pre-anesthetic medications in surgical procedures.

MATERIALS & METHODS

Over six months, the study meticulously documented prescribing practices and pre-anesthetic drug applications for patients of all genders and age ranges undergoing general anesthesia surgeries, including routine and emergency settings. Demographic information, surgical reasons, and medication specifics were

recorded and organized in an Excel spreadsheet for statistical analysis using SPSS software. The results are presented in counts and percentages for categorical variables, and means and

standard deviations for continuous variables, providing a comprehensive understanding of pre-anesthetic medication use in various surgical contexts.

Table 1: Indications of surgery

Condition	Number	Percentage
Perforation peritonitis	18	18
Chronic suppurative otitis media	8	8
Carcinoma/ Tumor	23	23
Lower (uterine) segment caesarean section	12	12
Appendix perforation	10	10
Intestinal obstruction	15	15
Blunt trauma to abdomen	8	8
Others	6	6
Total	100	100

Table 2: Pre-anesthetic medications

Pre-anesthetic medications	Number	Percentage
Ondansetron	97	97
Midazolam	95	95
Pentazocine	89	89
Atropine/glycopyrrolate	81	81
Fentanyl	23	23
Ranitidine + Metoclopramide	100	100

Table 3: Types of cancer in which fentanyl was used

Indications	Number	Percentage
Oral cancer	5	50
Malignant ovarian tumor	2	20
Esophagus cancer	2	20
Cholangiocarcinoma	1	10
Total	10	100

RESULTS

A total of 100 patients were evaluated. among them, surgeries performed were carcinoma/ tumor, perforation peritonitis, intestinal obstruction, lower (uterine) segment caesarean section, appendix perforation, chronic suppurative otitis media and blunt trauma to abdomen 23 percent, 18 percent, 15 percent, 12 percent, 10 percent, 8 percent and 8 percent of the patients respectively. Ondansetron, Midazolam, Pentazocine, Atropine/glycopyrrolate, Fentanyl and Ranitidine + Metoclopramide were prescribed in 97 percent, 95 percent, 89 percent, 81 percent, 23 percent, and 100 percent of the patients respectively.

DISCUSSION

Surgical interventions and the administration of anesthesia elicit a multifaceted stress response that correlates with the extent of tissue injury, duration of the surgical procedure, volume of blood loss during the operation, and intensity of postoperative discomfort. The detrimental metabolic and hemodynamic consequences of this stress response can lead to various complications during the perioperative phase. Mitigating the stress response associated with surgical procedures and trauma is crucial for enhancing patient outcomes, reducing the duration of hospital stays, and minimizing overall healthcare costs. It is widely

acknowledged that the provision of safe and effective surgical and anesthetic care necessitates an optimized patient condition. Numerous extensive epidemiological studies have suggested that insufficient preoperative patient preparation may significantly contribute to the leading causes of perioperative mortality.⁷⁻¹⁰ Hence; the present study was conducted for drug utilization pattern of pre-anesthetic medications in surgical procedures.

A total of 100 patients were evaluated. Among them, surgeries performed were Carcinoma/ Tumor, Perforation peritonitis, Intestinal obstruction, Lower (uterine) segment caesarean section, Appendix perforation, Chronic suppurative otitis media and Blunt trauma to abdomen 23 percent, 18 percent, 15 percent, 12 percent, 10 percent, 8 percent and 8 percent of the patients respectively.

Ondansetron, Midazolam, Pentazocine, Atropine/glycopyrrolate, Fentanyl and Ranitidine + Metoclopramide were prescribed in 97 percent, 95 percent, 89 percent, 81 percent, 23 percent, and 100 percent of the patients respectively. A study by Wong HY et al investigated the effects of preanesthetic medication using intramuscular midazolam in 100 elderly patients (aged 60-86 years). The patients received either 1, 2, or 3 mg of midazolam or a placebo in a randomized, double-blind trial. Sedation, anxiety, and recall were assessed at 15-minute intervals for one hour, with picture cards presented to evaluate recall 24 hours later. The results showed that all three midazolam doses produced rapid sedation, anxiolysis, and anterograde amnesia, which decreased in intensity by 60 minutes. The effects were comparable to those seen in younger patients with higher doses, although the 1-mg dose had shorter-lived effects. However, three patients (3%) over 70 years old became unresponsive to stimuli, highlighting the need for cautious use of intramuscular midazolam in patients aged 70 and older. The study concludes that 2 or 3 mg of intramuscular midazolam can be effective as preanesthetic medication in adults aged 60-69, but should be used with caution in older patients.¹¹ Jain R et al compared the antiemetic effects of ondansetron and glycopyrrolate during cesarean section. Sixty-six parturients (American Society of Anesthesiologist physical status I-II) scheduled for elective cesarean section were randomized to receive intravenous ondansetron 4 mg (Group O, n = 32) or glycopyrrolate 0.2 mg (Group G, n = 31) before spinal anesthesia. Outcome measures studied were emesis, episodes of hypotension and bradycardia and pain, till 10 h postoperative. Statistical software used was Epi Info 7 and Microsoft Excel. There was no significant difference in nausea and vomiting at all the study intervals between the two groups statistically. There was no difference in episodes of hypotension, but episodes of bradycardia were significantly less in glycopyrrolate group (26%) than in ondansetron group (56%) ($P = 0.027$). There was no difference in additional analgesic requirements. However, the incidence of dry mouth was significantly greater in glycopyrrolate group (21 [68%]) as compared to ondansetron group (5 [16%]) ($P = 0.00$). Effect of glycopyrrolate on nausea and vomiting during cesarean section are comparable to ondansetron, but with an increased incidence of dry mouth.¹²

CONCLUSION

Ondansetron, midazolam, and pentazocine represent the primary pre-anesthetic agents employed in the context of major surgical

procedures. Additionally, fentanyl is frequently utilized as a pre-anesthetic medication for patients diagnosed with cancer.

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