

Pattern of Pre-Anesthetic Medications Used In Various Surgical Specialties in A Tertiary Care Hospital

Rosi Pradhan¹, Anil Maharjan¹, Bibena Lamichhane¹, Anisha Bhochhibhoya¹, Parichhya Bista¹, Anjan Khadka², Uttam Laudari³, Aditya Kumar Jha³, Ashmita Bhochhibhoya⁴

¹ Department of Anesthesia, Kist Medical College Teaching Hospital, Imadol, Lalitpur, Nepal.

² Department of Pharmacology, NAIHS, Sanobharyang, Kathmandu, Nepal.

³ Department of Surgery, Kathmandu University School of Medical Sciences, Nepal.

⁴ Department of Medicine, National Centre for Rheumatic Disease, Ratopul, Nepal.

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Correspondence

Rosi Pradhan

Lecturer, Department of Anesthesia,
KIST Medical College Teaching Hospital,
Imadol, Lalitpur, Nepal.

Email: rosy_pradhan5@hotmail.com

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Abstract

Introduction: Most of the surgeries done in our country under anesthesia are mostly at urban region and very low number at remote areas. Even those surgeries done under anesthesia do not receive proper premedication. Pre-anesthetic medicine has been linked to a variety of outcomes, including postoperative recovery time, the need for postoperative analgesia, and hospital stay. Yet, we have very less data regarding the patterns of use of drugs for premedication.

Methods: It is a cross-sectional descriptive study performed in the department of Anesthesiology at KIST Medical College and Teaching Hospital from 15th Feb 2022 till 14th Feb 2023, after obtaining ethical clearance from the Institutional Review Committee. The total sample size was 385 which were calculated using Cochran formula. All the patients who belonged to American Society of Anesthesiologists (ASA) I-III undergoing elective surgical procedures and administered premedication were selected for the study only after their informed written consent.

Results: Out of 496 cases, 385 (53.8%) of patients were selected and pre-medications were recorded. The premedication used were metoclopramide 375 (97.4%), pantoprazole 375 (97.4%), paracetamol 52 (13.5%), glycopyrrolate 26 (6.75%), pregabalin 21 (5.45%), alprazolam 20 (5.19%), and lorazepam 1 (0.25%). Types of surgeries categorizations were 59.22 % general surgery, 17.92% Gynecological and Obstetrics, 17.14% Orthopedic cases, 4.67% ENT and 1.04% dental cases.

Conclusion: The most commonly administered pre-anesthetic drugs were metoclopramide, pantoprazole, paracetamol, pregabalin, alprazolam and then lorazepam.

Keywords: Anesthesia, pre-anesthetic medications, surgical procedures

Introduction

Every year worldwide, approximately more than 310 million operations are performed,¹ among them more than 200 million patients underwent major surgery.² Pre-anesthetic medications are the drugs used before administration of an anesthetic agent before surgery to achieve various goals, including reducing anxiety, inducing sedation, preventing nausea and vomiting, and providing analgesia.^{3,4} The choice of pre-anesthetic medications may vary depending on the surgical specialty, patient characteristics, and the specific

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requirements of the surgery.^{3,4}

In our nation, anesthesia-assisted procedures are performed primarily in urban areas with relatively few in rural ones.⁵ Due to a shortage of anesthesia experts, even procedures performed under general anesthesia do not receive the appropriate premedication (1:100,000 population). Pre-anesthetic medication has been connected to a number of outcomes, such as length of hospital stay, postoperative analgesia requirement, and postoperative recovery time. However, our knowledge of the drug use patterns for premedication is extremely limited. Since surveys from Europe and America make up the majority of the literature, our survey sheds light on the state of premedication practices today and encourages change.⁶

The purpose of this study was to investigate the pre-anesthetic drug usage patterns in different surgical specialties within a tertiary care hospital.

Methods

After receiving institutional review committee ethical clearance, this cross-sectional descriptive study was carried out in the anesthesiology department at KIST Medical College and Teaching Hospital from February 15, 2022, to February 14, 2023. Reference Number: 078/79/61. The Cochran formula was used to determine the sample size, which came to 385 in total.

Minimum sample size (n) = $Z^2 \cdot p \cdot q / e^2$ Where n is minimum sample size, P is prevalence; q is 1-p; Z is 1.96 at 95% CI and error 5%.

$$= 3.8416 \times 0.5 \times 0.5 / 0.0025$$

$$= 384.16$$

$$= 385$$

All the patients who belonged to American Society of Anesthesiologists (ASA) I-III undergoing elective surgical procedures and administered premedication were selected for the study only after their informed written consent. The study excluded patients with ASA IV status, those under the age of five and those over 75, and those who did not receive premedication. Data on the department, diagnosis, type of preanesthetic medication, and demographic trend were gathered using the predesigned proforma. Investigators gathered the data, entered it into Microsoft Excel, and used SPSS version 23 for analysis. When needed, tables and bar graphs are used to illustrate the data, which are stated as numbers, percentages, means, and standard deviations.

Results

The total surgeries performed in the period of one year in KIST Medical College and Teaching Hospital was 1250 which ranges from minor (276), intermediate (618), major (309) to supra-major (47) surgeries done under local to general

anesthesia depending upon the severity and type. Among those intermediate to supra-major surgeries, the number of elective surgeries and emergency surgeries performed under general and regional anesthesia were 636 and 338 respectively. Among 636 elective surgeries, only 496 fulfilled our study criteria. Out of 496 selected surgeries, first 385 surgeries who gave consent for enrollment of their data in study were selected and its premedication data were recorded.

The medicines used as premedication in 385 patients were metoclopramide 375 (97.4%), pantoprazole 375 (375 (97.4%), paracetamol 52 (13.5%), glycopyrrolate 26 (6.75%), pregabalin 21 (5.45%), alprazolam 20 (5.19%), and lorazepam 1 (0.25%). The dosages of these drugs are shown in Table 1.

Table 1: Dosage of drugs

Groups	Drugs	Dose
Dopamine antagonist (Anti-emetic)	Metoclopramide	10 mg po
Proton pump inhibitor	Pantoprazole	40m g po
Antipyretic	Paracetamol	1gm po
Anticholinergic	Glycopyrrolate	0.2mg iv
GABA analog (Analgesic)	Pregabalin	150mg po
	Alprazolam	0.25mg po
Benzodiazepine	Lorazepam	2mg po

The number of surgeries performed in different surgical specialties are shown in Table 2.

Table 2: Types of Surgeries

Type	Number	Percentage (%)
General surgeries	228	59.22
Obstetric and Gynecologic surgeries	69	17.92
Orthopaedic surgeries	66	17.14
ENT surgeries	18	4.67
Dental surgeries	4	1.04

The list of anesthesia used in different surgical specialties are demonstrated in figure 1.

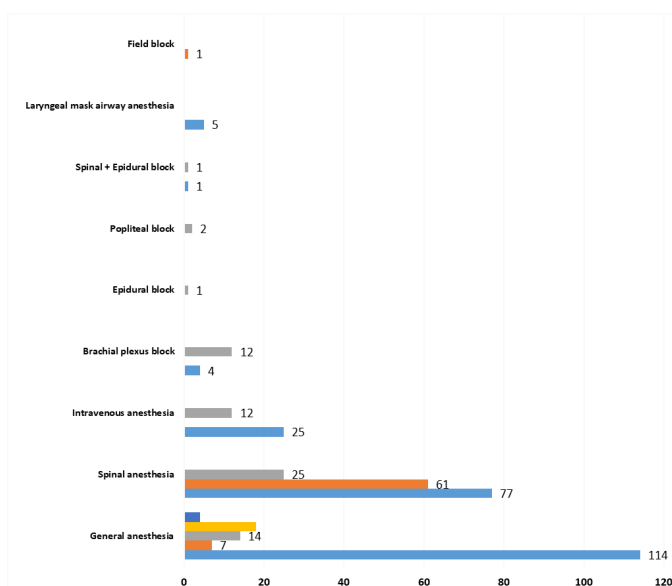


Fig 1: List of anesthesia used in different surgical specialties

Discussion

This study showed that the majority of patients that underwent surgery were female and regarding the age group mostly were of 25-39 years of age. This finding is in congruent with the findings of study by Shah et al 2020, where majority of population were of female gender (61.8%) and between the age group of 25-39 years of age (53.8%).⁷ Also similar results were found as per the retrospective study done by Gajjala et al in 2019.⁸ However, it differ from the findings reported by Kulkarni et al in 2017, where most of the patients were of male gender and mean age group was found to be 42.36 years.³ The shifting of operative procedures in young age group might be due to early diagnosis of the diseases due to recent advances in diagnostic technology. However, it also implies that the shifting of operative procedures in young population requires training of health professionals and institutions in caring younger population.

There were different surgical procedures, majority from the department of general surgery and least from the department of dental surgery. The most commonly administered anesthesia was general anesthesia (51.7%) followed by spinal anesthesia (42.3%) and regional blocks (5.7%).

The most common premedication used was antiemetic-metoclopramide 10 mg per oral and proton pump inhibitor-pantoprazole 40 mg per oral in 97% of the cases followed by paracetamol (13.5%) and glycopyrrolate (6.7%) and least used was lorazepam (0.2%). Intra- and postoperative nausea and vomiting are common in most of operations,

and varied incidences of nausea and vomiting with rates up to 60–80 % were reported in the medical literature.⁹ Metoclopramide is an economical antiemetic used in the management of anesthesia-associated nausea and vomiting. Metoclopramide raises lower esophageal sphincter tone and exhibits anti-dopaminergic and anti-serotonergic effects.^{10, 11} At a dose of 10 mg, it is safe for the patients including pregnant and is not associated with adverse fetal or neonatal effects.^{12, 13} Aspiration of gastric contents at the time of anesthesia induction is a serious complication that can lead to death in the perioperative period. Patients at increased risk of gastric aspiration include children, the elderly, those undergoing abdominal surgery and those with a history of delayed gastric emptying.¹⁴⁻¹⁶ So, use of proton pump inhibitor Pantoprazole is essential as premedication. Glycopyrrolate has been widely used as a preoperative medication to inhibit salivary gland secretions. The most frequent reasons for administering anticholinergics include producing an antisialagogue effect, creating a sedative and amnesic effect, and preventing reflex bradycardia.¹⁷ Since patients may be anxious in the perioperative period, the anxiolytic effects of pregabalin may be beneficial. In a study of Park et al, 2016, a single dose of 150 mg pregabalin 2 hours before spinal anesthesia showed sufficient efficacy during the first postoperative 24 hours.¹⁸ High levels of preoperative fear and anxiety correlate with various unfavorable outcomes, including increases in postoperative analgesic requirements, prolonged post anesthesia care unit or hospital stays, and delayed negative psychological effects.⁶ Choi et al, 2017, reported that oral alprazolam attenuated the anxiety and preoperative stress responses.¹⁹

The study conducted by Shah R et al (2020) reported that all patients except children received midazolam and pethidine followed by glycopyrrolate (88%), ondansetron (69%) and others (ketorolac and buscopan, 14.2%).⁷ But Oral premedication with 0.5 mg of alprazolam decreases anxiety to the same extent as 7.5 mg of oral midazolam. In majority of patients, alprazolam was found to be as effective as midazolam for anxiety reduction.²⁰ The findings are similar to study done by Patil and Kulkarni in 2017 where Metoclopramide was used in 98% of cases.³ In other studies, Ondansetron was the most commonly used anti-emetics like study done by Venkitachalam et al in 2018.²¹ Anti-emetics are very important for preventing post-operative nausea and vomiting especially in cases where general anesthesia is administered.²² In most of the other studies, anti anxiety drugs were most commonly used, like study done by Venkitachalam et al in 2018, where midazolam was used in 100% of cases.²¹ However, as per study done by Kulkarni et al in 2017, only 10.9% received anti-anxiety drugs and that too midazolam was most commonly used similar to our study.³ Previously diazepam used to be commonly used benzodiazepines. But now a days midazolam is commonly used, which may be due to faster onset of action, shorter duration and higher

potency compared to diazepam. Among the analgesics, paracetamol (13.5%) and pregabalin (5.4%) were used as premedication to decrease the pain and intraoperative opioid requirement. In contrast, as per study done by Bishwas et al in 2014, fentanyl were commonly used as premedication to decrease the pain, while in a study done by Shah et al in 2020, ketorolac was commonly used as a premedication analgesics.²³ The change in opioid premedication to non-opioid group may be to prevent opioid related post-operative side effects.

Most of the literature supported the rationale of using the premedication that was used in our setting.

Conclusion

The study provides a comprehensive overview of the pattern of pre-anesthetic medications used in various surgical specialties in a tertiary care hospital, emphasizing the need for individualized approaches to patients undergoing different surgical procedures. In our hospital setting the most commonly administered pre-anesthetic drugs were metoclopramide, pantoprazole, paracetamol, pregabalin, alprazolam and then lorazepam. Rationale of use for all the drugs were justified.

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