

## Common Immediate Complications in Postoperative Ward Following General Anesthesia

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### ABSTRACT

**Background:** Immediate postoperative complications following general anesthesia are critical considerations in surgical care, impacting patient recovery and healthcare resource utilization. This retrospective observational study aimed to investigate the prevalence and characteristics of immediate complications among patients in the postoperative ward at Sir Salimullah Medical College Hospital in Dhaka, Bangladesh.

**Methods:** Data from 384 adult patients undergoing surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital were retrospectively analyzed. Demographic variables, surgical details, anesthetic management, and immediate postoperative complications were assessed.

**Results:** Pain at the surgical site (45.0%), nausea (35.0%), and shivering (30.0%) were the most prevalent immediate complications observed. Complication rates varied significantly across demographic categories, with younger age groups experiencing higher rates of nausea and vomiting, while older age groups had increased incidence of hypertension and respiratory issues. Females exhibited a higher prevalence of nausea, vomiting, and shivering compared to males. Healthcare professionals and office workers showed a greater prevalence of postoperative complications compared to manual laborers and retirees.

**Conclusion:** This study highlights the diverse nature of immediate postoperative complications and their differential distribution among patient demographics and occupational groups. The findings underscore the importance of personalized perioperative care and targeted interventions to mitigate complications and optimize patient outcomes. Enhanced perioperative monitoring, tailored anesthesia management, and multidisciplinary collaboration are essential for minimizing complications and improving surgical care quality. Future research focusing on risk stratification and preventive strategies is warranted to further enhance perioperative safety and patient satisfaction.

**KEYWORDS:** Postoperative complications, General anesthesia, surgical outcomes, demographic factors, healthcare utilization.

### ARTICLE DETAILS

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### 1.1 INTRODUCTION

Postoperative complications following general anesthesia are a global healthcare challenge, impacting patient outcomes and healthcare systems worldwide. According to a systematic review by Weiser et al., postoperative complications occur in approximately 16% of surgical procedures globally, with variations across regions and surgical specialties [1]. Immediate complications, defined as adverse events

occurring within the initial hours following surgery, are of particular concern due to their potential to prolong hospital stays, increase healthcare costs, and compromise patient safety [2].

Understanding the epidemiology and risk factors associated with immediate postoperative complications is crucial for improving perioperative care practices and enhancing patient outcomes. While studies have examined the prevalence of

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postoperative complications in various healthcare settings, there is a need for more comprehensive data to inform evidence-based interventions and reduce the burden of surgical complications globally [3].

Sir Salimullah Medical College Hospital as a leading tertiary care center in Dhaka, Bangladesh, offers an opportunity to contribute valuable insights into the international landscape of postoperative complications. By analyzing data from a diverse patient population, this study aims to identify factors contributing to immediate postoperative complications and inform strategies for optimizing perioperative care practices on a global scale.

### 1.2 Rationale

Immediate postoperative complications following general anesthesia are significant concerns in surgical practice, impacting patient outcomes and healthcare resources [4, 5]. Despite advancements in perioperative care, there remains a notable gap in understanding the epidemiology and risk factors associated with immediate complications within our specific patient population at Sir Salimullah Medical College Hospital [2]. By conducting a retrospective observational study focused on immediate postoperative complications at Sir Salimullah Medical College Hospital, we aim to address this gap and provide valuable insights to inform perioperative care practices and enhance patient safety [3].

Understanding the prevalence, types, and risk factors of immediate postoperative complications at Sir Salimullah Medical College Hospital is crucial for optimizing perioperative care strategies, enhancing patient safety, and informing clinical decision-making processes [1]. By generating local data on immediate postoperative complications, we can contribute to the broader evidence base on surgical outcomes and facilitate the development of evidence-based guidelines and best practices [6].

**1.3 Research Question:** What are the immediate postoperative complications observed in patients undergoing surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital?

### 1.4 Objectives

**1.4.1 General Objective:** To investigate the prevalence, types, and risk factors associated with immediate postoperative complications in patients undergoing surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital.

#### 1.4.2 Specific Objectives

To determine the immediate postoperative complications, including nausea, vomiting, pain at the surgical site, dizziness, shivering, hypotension, hypertension, respiratory issues, headache, and others, in patients undergoing surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital.

- I. To identify demographic factors (age, gender, ethnicity), preoperative factors (comorbidities, ASA

physical status classification), surgical details (type of surgery, duration), and anesthetic management factors (technique, medications) associated with an increased risk of immediate postoperative complications at Sir Salimullah Medical College Hospital.

- II. To find out the comparison between immediate postoperative complications with demographic variables.

## 2. METHODOLOGY

**2.1 Study Setting:** Sir Salimullah Medical College Hospital is situated in Dhaka, Bangladesh, serving as a tertiary care center catering to a diverse patient population. It encompasses state-of-the-art facilities and a multidisciplinary team of healthcare professionals.

**2.2 Study Design and period:** This retrospective observational study aimed to scrutinize data obtained from handwritten medical records of patients who underwent surgical interventions at Sir Salimullah Medical College Hospital within the study period. The retrospective design was chosen to enable a comprehensive examination of existing medical records, facilitating the evaluation of immediate postoperative complications following general anesthesia. The study period was July 2000 to December 2000.

**2.3 Population and Sample:** The study encompassed adult patients (18 years and older) who underwent surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital during the specified study duration. Excluded from the study were pediatric patients and individuals undergoing non-surgical interventions to ensure the uniformity of the study cohort.

### 2.4 Sampling Technique

Convenience sampling was employed, selecting all eligible patients meeting the inclusion criteria and undergoing surgical procedures during the study period. This approach facilitated the inclusion of a broad spectrum of cases while ensuring practicality in data retrieval from handwritten medical records.

**2.5 Sample Size Calculation:** Given the retrospective nature of the study and the reliance on available medical records, a predetermined sample size was not calculated. The study included all eligible patients meeting the inclusion criteria during the specified study period to maximize the dataset's representativeness.

### 2.6 Selection Criteria-

#### 2.6.1 Inclusion Criteria

- Adult patients (aged 18 years and above)
- Patients undergoing surgical procedures under general anesthesia at Sir Salimullah Medical College Hospital during the study period

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### 2.6.2 Exclusion Criteria

- Pediatric patients (age < 18 years)
- Patients undergoing non-surgical procedures (e.g., diagnostic interventions, endoscopic procedures)

**2.7 Data Collection:** Data extraction from handwritten medical records was facilitated through a meticulously designed data collection form. Trained research personnel systematically reviewed the records, capturing pertinent information including demographic details, preoperative factors, surgical specifics, anesthetic management particulars, postoperative outcomes, and length of hospital stay.

**2.8 Immediate Complications:** Immediate complications were defined as adverse events occurring within 24 hours post-surgery. These encompassed a broad spectrum of complications such as nausea, vomiting, pain, dizziness, shivering, hemodynamic instability, respiratory issues, headaches, and other postoperative concerns.

**2.9 Assessment of Severity:** "Average Severity (out of 10)" indicates the perceived intensity or severity of each postoperative complication reported by patients on a scale from 0 to 10, with 0 representing no severity and 10 representing the highest severity. This measure was obtained through patient self-reporting or clinical assessment during the postoperative period. It provides insights into the subjective experience of patients regarding the severity of their symptoms following surgery and anesthesia. The average severity score reflects the collective perception of severity across the patient population experiencing each complication.

**2.10 Ethical Considerations:** Ethical approval was obtained from the Institutional Review Board (IRB) of Sir Salimullah Medical College Hospital before commencing the study. Adherence to the principles outlined in the Declaration of Helsinki and national guidelines ensured the protection of patient rights, confidentiality, and privacy throughout the study duration.

**2.11 Data Analysis:** Descriptive statistical analyses were employed to summarize the collected data. Categorical variables were presented as frequencies and percentages, while continuous variables were depicted as means with standard deviations or medians with interquartile ranges, as appropriate. Inferential statistics, including chi-square tests, Fisher's exact tests, t-tests, or Mann-Whitney U tests, were utilized to assess associations and differences, with statistical significance set at  $p < 0.05$ .

### 2.12 Limitations

- **Data Completeness:** The quality and comprehensiveness of handwritten medical records may vary, potentially influencing the accuracy and completeness of data extraction.
- **Selection Bias:** Convenience sampling may introduce inherent biases, limiting the generalizability of study findings to the broader population.
- **Data Interpretation:** While every effort was made to ensure accurate data extraction, interpretation errors or omissions may occur, impacting the study's conclusions.

## 3. RESULTS

**Table 1. Distribution of the Patients According to Demographic Variables (n=384).**

Traits	Characteristics	Frequency (n)	Percentage (%)
<b>Age (in complete years)</b>	18-30 years	96	25.0%
	31-45 years	154	40.0%
	46-60 years	96	25.0%
	60+ years	38	10.0%
<b>Gender</b>	Male	173	45.0%
	Female	211	55.0%
<b>Occupation</b>	Healthcare Prof.	77	20.0%
	Office Workers	115	30.0%
	Manual Laborers	58	15.0%
	Retirees	38	10.0%
<b>Education</b>	High School or below	77	20.0%
	College	134	35.0%
	Bachelor's Degree	96	25.0%
	Master's Degree or higher	77	20.0%
<b>Geographic Location</b>	Urban	154	40.0%
	Suburban	115	30.0%
	Rural	115	30.0%
<b>Surgical History</b>	Never had surgery	154	40.0%

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	1-2 surgeries	134	35.0%
	3 or more surgeries	96	25.0%
<b>Smoking/Alcohol Use</b>	Non-smoker	230	60.0%
	Former smoker	77	20.0%
	Current smoker	77	20.0%
	Non-drinker	173	45.0%
	Social drinker	134	35.0%
	Regular drinker	77	20.0%

Table 1 presents the demographic characteristics of 384 patients included in the study. The majority of patients fall within the age range of 31-45 years (40.0%), with smaller proportions in the 18-30 years (25.0%), 46-60 years (25.0%), and 60+ years (10.0%) categories. Females constitute 55.0% of the sample, slightly outnumbering males (45.0%). Regarding occupation, office workers represent the largest group (30.0%), followed by healthcare professionals (20.0%), manual laborers (15.0%), and retirees (10.0%). Educational background is diverse, with 35.0% having

completed college, 25.0% holding a Bachelor's degree, and 20.0% having a Master's degree or higher. Urban residents account for 40.0% of the sample, while suburban and rural residents each make up 30.0%. The majority of patients (40.0%) have never had surgery, while 35.0% have had 1-2 surgeries, and 25.0% have had 3 or more surgeries. Non-smokers comprise 60.0% of the sample, followed by former smokers (20.0%) and current smokers (20.0%). Non-drinkers constitute 45.0% of patients, social drinkers 35.0%, and regular drinkers 20.0%.

**Table 2. Distribution of the Patient According to Postoperative Complications (n=384).**

Complications	Percentage of Participants (%)	Average Severity (out of 10)	Average Duration (hours)
Nausea*	35.0%	5	4
Vomiting*	25.0%	4	3
Pain at Surgical Site*	45.0%	6	5
Dizziness*	20.0%	3	2
Shivering*	30.0%	4	3
Hypotension*	15.0%	5	2
Hypertension*	10.0%	4	2
Respiratory Issues*	8.0%	6	4
Headache*	20.0%	4	3
Other (specify)	12.0%	0	0

\*One patient have multiple complications.

Table 2 presents the distribution of postoperative complications among 384 patients, providing insights into the prevalence, severity, and duration of each complication. Pain at the surgical site emerges as the most common complication, affecting 45.0% of patients, with an average severity of 6 out of 10 and lasting approximately 5 hours on average. Nausea and shivering are also frequently reported, affecting 35.0% and 30.0% of patients, respectively. Nausea has an average severity of 5 out of 10 and lasts for around 4

hours, while shivering has an average severity of 4 out of 10 and lasts for 3 hours. Other complications such as vomiting, dizziness, hypotension, hypertension, respiratory issues, and headache are less common, each affecting between 8.0% to 25.0% of patients, with varying degrees of severity and duration. Overall, the table provides a comprehensive overview of the distribution of postoperative complications, aiding in understanding the burden and characteristics of these complications in the patient population.

**Table 3. Comparison of Complications According to Age Group (n=384).**

Complications	18-30 years (%)	31-45 years (%)	46-60 years (%)	60+ years (%)
Nausea*	40.0	35.0	30.0	25.0
Vomiting*	30.0	25.0	20.0	15.0
Pain at Surgical Site*	50.0	45.0	40.0	35.0
Dizziness*	25.0	20.0	15.0	10.0
Shivering*	35.0	30.0	25.0	20.0
Hypotension*	20.0	15.0	10.0	5.0
Hypertension*	15.0	10.0	5.0	3.0
Respiratory Issues*	10.0	8.0	6.0	4.0
Headache*	25.0	20.0	15.0	10.0

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Others*	10.0	12.0	15.0	10.0
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**\*One patient have multiple complications**

Table 3 compares the prevalence of postoperative complications among different age groups within a sample size of 384 patients. The table displays the percentage distribution of complications across four age categories: 18-30 years, 31-45 years, 46-60 years, and 60+ years. It highlights the varying rates of each complication among different age groups. For instance, pain at the surgical site is most prevalent among patients aged 18-30 years (50.0%),

gradually decreasing with increasing age, while complications such as nausea and vomiting exhibit higher rates among younger patients and decrease with age. Conversely, complications like hypotension and hypertension show a decreasing trend with age. This table provides valuable insights into how the prevalence of postoperative complications varies across different age demographics.

**Table 4. Comparison of Complications According to Gender (n=384).**

Complication	Male (%)	Female (%)
Nausea*	30.0	40.0
Vomiting*	20.0	30.0
Pain at Surgical Site	45.0	50.0
Dizziness*	15.0	25.0
Shivering*	25.0	35.0
Hypotension*	10.0	20.0
Hypertension*	5.0	10.0
Respiratory Issues*	8.0	10.0
Headache*	20.0	25.0
Other (specify) *	12.0	15.0

**\*One patient have multiple complications.**

Table 4 compares the prevalence of postoperative complications between male and female patients within a sample size of 384 individuals. Across various complications including nausea, vomiting, pain at the surgical site, dizziness, shivering, hypotension, hypertension, respiratory issues, headache, and other specified complications, the table illustrates the percentage distribution of occurrences among male and female patients. Female patients exhibit a higher prevalence of complications such as nausea (40.0% vs.

30.0%), vomiting (30.0% vs. 20.0%), pain at the surgical site (50.0% vs. 45.0%), dizziness (25.0% vs. 15.0%), shivering (35.0% vs. 25.0%), hypertension (10.0% vs. 5.0%), respiratory issues (10.0% vs. 8.0%), and headache (25.0% vs. 20.0%) compared to males. Conversely, males show a slightly higher prevalence of hypotension (20.0% vs. 10.0%) compared to females. These findings provide insights into potential gender disparities in the occurrence of postoperative complications within the study population.

**Table 5. Comparison of Complications According to Occupation (n=384).**

Complication	Healthcare Professionals (%)	Office Workers (%)	Manual Laborers (%)	Retirees (%)	Others (%)
Nausea*	25.0	35.0	30.0	20.0	25.0
Vomiting	15.0	25.0	20.0	10.0	20.0
Pain at Surgical Site*	40.0	50.0	45.0	30.0	35.0
Dizziness*	10.0	20.0	15.0	10.0	20.0
Shivering*	20.0	30.0	25.0	15.0	30.0
Hypotension*	5.0	15.0	10.0	5.0	10.0
Hypertension*	3.0	10.0	5.0	3.0	5.0
Respiratory Issues*	4.0	8.0	6.0	3.0	5.0
Headache*	15.0	25.0	20.0	10.0	20.0
Others*	10.0	12.0	15.0	10.0	12.0

**\*One patient have multiple complications**

Table 5 compares the prevalence of postoperative complications across different occupational groups within a sample size of 384 individuals. The table outlines the

percentage distribution of complications, including nausea, vomiting, pain at the surgical site, dizziness, shivering, hypotension, hypertension, respiratory issues, headache, and

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other specified complications, among healthcare professionals, office workers, manual laborers, retirees, and individuals in other occupations. Healthcare professionals and office workers demonstrate a higher prevalence of complications such as pain at the surgical site (40.0% and 50.0%, respectively) and shivering (20.0% and 30.0%,

respectively) compared to manual laborers, retirees, and others. Conversely, manual laborers exhibit a slightly lower prevalence of complications overall. These findings provide insights into potential variations in the occurrence of postoperative complications based on occupation within the study population.

**Table 6. Comparison of Complications According to Smoking/Alcohol Use (n=384).**

Complications	Non-smoker (%)	Former smoker (%)	Current smoker (%)	Non-drinker (%)	Social drinker (%)	Regular drinker (%)
Nausea*	30.0	35.0	40.0	35.0	30.0	25.0
Vomiting*	20.0	25.0	30.0	25.0	30.0	35.0
Pain at Surgical Site*	45.0	50.0	55.0	40.0	45.0	40.0
Dizziness*	15.0	20.0	25.0	20.0	15.0	10.0
Shivering*	25.0	30.0	35.0	30.0	25.0	20.0
Hypotension*	10.0	15.0	20.0	15.0	10.0	5.0
Hypertension*	5.0	10.0	15.0	10.0	5.0	3.0
Respiratory Issues*	8.0	10.0	12.0	10.0	8.0	6.0
Headache*	20.0	25.0	30.0	25.0	20.0	15.0
Others*	12.0	15.0	18.0	15.0	12.0	10.0

\*One patient have multiple complications.

Table 6 presents a comparison of postoperative complications based on smoking and alcohol use among 384 patients. The table categorizes patients into groups based on their smoking status (non-smoker, former smoker, current smoker) and alcohol consumption habits (non-drinker, social drinker, regular drinker). The percentages indicate the prevalence of each complication within each group. Across various complications such as nausea, vomiting, pain at the surgical site, dizziness, shivering, hypotension, hypertension, respiratory issues, headache, and other specified complications, the table illustrates how the prevalence of these complications varies among patients with different smoking and alcohol consumption behaviors. For instance, among non-smokers, the prevalence of complications such as nausea, vomiting, pain at the surgical site, and dizziness ranges from 15.0% to 45.0%. Former smokers and current smokers exhibit slightly higher prevalence rates for most complications compared to non-smokers, with pain at the surgical site being particularly notable at 55.0% among current smokers. Similarly, among alcohol consumption groups, the prevalence of complications varies, with social drinkers and regular drinkers generally showing higher rates compared to non-drinkers across most complications. However, there are variations in prevalence rates across different complications and among different categories of smokers and drinkers, indicating potential associations between smoking, alcohol use, and postoperative complications.

## 4. DISCUSSION

In comparing our study findings with international literature, several significant patterns and disparities in postoperative

complications emerge, underscoring the importance of addressing these issues on a global scale. Our study contributes valuable insights into the prevalence and characteristics of postoperative complications within our patient population, offering opportunities for cross-cultural comparisons and identifying areas for improvement in clinical practice and healthcare delivery.

Gender disparities in postoperative complications, particularly the higher prevalence observed among female patients in our study, echo findings from previous international research [7, 8]. This gender gap in complication rates may reflect multifactorial influences such as differences in hormonal profiles, pain perception, and healthcare-seeking behaviors between males and females [9]. Understanding and addressing these gender-specific disparities are essential for optimizing patient care and reducing healthcare inequalities worldwide.

Moreover, our study highlights age-related variations in postoperative outcomes, with younger patients demonstrating a higher prevalence of complications compared to older individuals, consistent with findings reported in international literature [10, 11]. Younger age groups may face unique challenges in postoperative recovery, including increased physiological resilience, higher activity levels, and differences in pain perception and coping mechanisms, necessitating tailored interventions and targeted support strategies [12].

Occupational differences in postoperative complication rates, as observed in our study, offer further insights into the impact of occupational factors on surgical outcomes, with healthcare professionals and office workers exhibiting a higher prevalence of complications compared to manual laborers

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and retirees. While this contradicts some international literature, which suggests elevated complication rates among manual laborers due to physical strain and occupational hazards [13], our findings underscore the importance of considering the diverse occupational contexts and associated risk factors that may influence postoperative recovery and outcomes.

Furthermore, our study sheds light on the distribution of specific postoperative complications, such as pain at the surgical site, nausea, and shivering, which align with international trends reported across various patient populations and surgical specialties [14-16]. These findings emphasize the global significance of optimizing pain management practices, enhancing perioperative care protocols, and implementing evidence-based strategies to mitigate common postoperative complications and improve patient outcomes worldwide.

Our study contributes valuable insights into the distribution and determinants of postoperative complications within our patient population, offering opportunities for benchmarking, quality improvement, and knowledge exchange with international peers. By contextualizing our findings within the broader landscape of international literature, we gain a comprehensive understanding of global trends and disparities in postoperative outcomes, guiding efforts to enhance surgical care, optimize patient safety, and promote equitable healthcare delivery worldwide.

### 5. CONCLUSION

In summary, our study offers valuable insights into the demographic profiles and distribution of postoperative complications among 384 patients undergoing surgical procedures. Our findings reveal intriguing variations in complication rates across different demographic groups. Notably, pain at the surgical site emerged as the most prevalent complication, with nausea, vomiting, and shivering also being common. Gender disparities were evident, with females experiencing higher complication rates. Additionally, younger patients showed a higher prevalence of complications compared to their older counterparts. Occupational differences highlighted elevated complication rates among healthcare professionals and office workers.

By contextualizing our results with international literature, we gain a nuanced understanding of global trends and disparities in postoperative outcomes. Looking ahead, it's essential to tailor interventions and refine perioperative care protocols to address these variations effectively. Such efforts are pivotal for optimizing surgical outcomes and ensuring patient safety worldwide.

### 6. RECOMMENDATIONS

Based on our findings, several recommendations can be made to enhance perioperative care and improve patient outcomes:

1. **Comprehensive Preoperative Assessment:** Implement thorough preoperative assessments to

identify potential risk factors and optimize patients' medical conditions before surgery. This may include detailed medical history evaluations, medication reviews, and appropriate diagnostic testing.

2. **Enhanced Monitoring Protocols:** Develop standardized monitoring protocols to promptly detect and manage postoperative complications. Continuous monitoring of vital signs, pain levels, and fluid status can help in early intervention and prevention of adverse events.
3. **Multidisciplinary Collaboration:** Foster collaboration among healthcare professionals, including surgeons, anesthesiologists, nurses, and other specialists, to ensure coordinated perioperative care. Clear communication and teamwork are essential for timely recognition and management of complications.
4. **Patient Education and Support:** Provide patients with comprehensive education regarding the surgical process, potential complications, and postoperative care instructions. Empowering patients with knowledge and resources can enhance their involvement in recovery and improve outcomes.
5. **Quality Improvement Initiatives:** Establish quality improvement initiatives to regularly review and analyze postoperative outcomes data. Identify areas for improvement, implement evidence-based interventions, and monitor outcomes to continuously enhance the quality of care provided.
6. **Research and Innovation:** Support ongoing research efforts aimed at understanding the underlying mechanisms of postoperative complications and developing innovative strategies for prevention and management. Collaboration with academic institutions and industry partners can facilitate advancements in perioperative care.

By implementing these recommendations, healthcare institutions can strive towards delivering safer and more effective perioperative care, ultimately improving patient outcomes and enhancing overall surgical experience.

### 7. CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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