Section: General Surgery

Original Research Article

POSTOPERATIVE COMPLICATIONS AND READMISSION RATES IN ELDERLY PATIENTS UNDERGOING COLORECTAL SURGERY: A POPULATION-BASED OBSERVATIONAL ANALYSIS

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Abstract

Background: Elderly patients undergoing colorectal surgery are at increased risk of postoperative complications and hospital readmissions. Identifying common complications and their impact on readmission rates can help improve perioperative care and patient outcomes. **Materials and Methods:** This population-based observational study included 100 elderly patients (≥65 years) who underwent colorectal surgery. Patient demographics, comorbidities, postoperative complications, 30-day readmission rates, and in-hospital mortality were analyzed. Descriptive statistics were used to summarize the data, and associations between complications and readmissions were evaluated. **Result:** The mean patient age was 72.4 ± 5.8 years, with 56% males and 44% females. Common comorbidities included hypertension (52%), diabetes (40%), and cardiovascular disease (28%). The most frequently performed surgery was colectomy (62%). Postoperative complications were observed in 47% of patients, with surgical site infections (18%), postoperative ileus (15%), anastomotic leakage (10%), and pneumonia (9%) being the most prevalent. The 30-day readmission rate was 22%, with infectious complications (40.9%) and gastrointestinal complications (36.4%) being the primary causes. The in-hospital mortality rate was 3%, and the median length of stay was 9 days (IQR: 7–13 days). **Conclusion:** Postoperative complications are common in elderly patients undergoing colorectal surgery, contributing to high readmission rates. Infectious and gastrointestinal complications are the leading causes of readmission. Improved perioperative management and early intervention strategies are essential to reducing complications and improving outcomes in this high-risk population.

INTRODUCTION

Colorectal surgery is a common procedure in elderly patients, often performed to treat colorectal cancer, diverticular disease, or inflammatory bowel conditions.[1] With an aging global population, the number of elderly individuals undergoing colorectal surgery is increasing.[2] However, advanced age is associated with multiple comorbidities, reduced physiological reserves, and increased susceptibility to postoperative complications, leading to higher morbidity, prolonged hospital stays, and increased readmission rates.[3,4]

Postoperative complications, such as surgical site infections (SSI), anastomotic leakage, ileus, pneumonia, and thromboembolic events, can significantly impact patient recovery and healthcare costs.[5] Among elderly patients, complications may be more severe due to pre-existing conditions such as diabetes, hypertension, and cardiovascular disease. The 30-day readmission rate is a critical indicator of surgical outcomes and healthcare efficiency, as unplanned readmissions often result from complications that could potentially be prevented with improved perioperative management.[6]

Several studies have examined postoperative outcomes in elderly surgical patients, but there is limited population-based data specifically evaluating postoperative complications and readmission rates following colorectal surgery in this high-risk group.[7] Identifying the most common complications and their impact on readmissions can help optimize perioperative care strategies, reduce hospital readmissions, and improve overall patient outcomes.

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This study aims to analyze postoperative complications and 30-day readmission rates in elderly patients undergoing colorectal surgery using a population-based approach. By understanding the factors contributing to adverse outcomes, we can develop targeted interventions to enhance patient recovery and reduce healthcare burdens.

MATERIALS AND METHODS

Study Design and Setting: This population-based observational study was conducted at Bhasker Medical College, Moinabad, Hyderabad, over a one-year period from January 2023 to December 2023. The study aimed to evaluate postoperative complications and 30-day readmission rates in elderly patients undergoing colorectal surgery.

Study Population: A total of 100 elderly patients (≥65 years old) who underwent elective or emergency colorectal surgery at Bhasker Medical College were included. Patients with incomplete medical records or those who underwent non-colorectal surgical procedures were excluded.

Data Collection: Patient data were collected from hospital medical records and included:

Demographic Information: Age, sex, comorbidities (diabetes, hypertension, cardiovascular disease).

Surgical Details: Type of colorectal surgery performed (colectomy, proctectomy, rectosigmoid resection).

Postoperative Complications: Surgical site infections (SSI), anastomotic leakage, postoperative ileus, pneumonia, deep vein thrombosis (DVT), pulmonary embolism (PE), and acute kidney injury (AKI).

Readmission Rates: Patients readmitted within 30 days post-surgery, along with reasons for readmission.

Mortality and Length of Hospital Stay: In-hospital mortality rate and median hospital stay duration.

Data Analysis: Descriptive statistics were used to summarize patient demographics, surgical details, complications, and readmission rates. Categorical variables were presented as percentages, and continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR). Associations between comorbidities, postoperative complications, and readmission rates were analyzed using chi-square tests and t-tests, with a p-value < 0.05 considered statistically significant.

Ethical Considerations: The study was approved by the Institutional Ethics Committee of Bhasker Medical College, Moinabad, Hyderabad. Patient confidentiality was maintained, and all data were anonymized before analysis.

RESULTS

Demographics and Baseline Characteristics: A total of 100 elderly patients (aged ≥65 years) undergoing colorectal surgery were included in the study. The mean age of the cohort was 72.4 ± 5.8 years, with 56% males and 44% females. Comorbidities were prevalent among the patients, with 40% having diabetes, 52% diagnosed with hypertension, and 28% presenting with cardiovascular disease. The most common surgical procedure was colectomy (62%), followed by proctectomy (23%) and rectosigmoid resection (15%) [Table 1].

Postoperative Complications: Postoperative complications were observed in 47% of the patients. The most frequently reported complications included surgical site infections (SSI) in 18% of cases, postoperative ileus in 15%, anastomotic leakage in 10%, and pneumonia in 9%. Additionally, 5% of patients developed deep vein thrombosis (DVT) or pulmonary embolism (PE), while 6% experienced acute kidney injury (AKI). Patients with pre-existing comorbidities, particularly diabetes and cardiovascular disease, exhibited a significantly higher incidence of complications ($p < 0.05$) [Table 2].

Readmission Rates and Causes: The 30-day readmission rate was recorded at 22%, with infectious complications (SSI and pneumonia) being the most common cause, accounting for 40.9% of readmissions. Gastrointestinal complications, including postoperative ileus, obstruction, and anastomotic leakage, contributed to 36.4% of readmissions. Thromboembolic events (DVT/PE) and acute kidney injury with electrolyte imbalances were responsible for 13.6% and 9.1% of readmissions, respectively [Table 3].

Mortality and Length of Stay: The in-hospital mortality rate was 3%, with sepsis and multiple organ failure identified as the primary causes. The median length of hospital stay was 9 days (IQR: 7–13 days), with significantly prolonged hospitalization observed in patients who developed complications ($p < 0.01$) [Table 4].

Table 1: Demographics and Baseline Characteristics.

Characteristic	Value
Total Patients	100
Mean Age (years)	72.4 ± 5.8
Male (%)	56
Female (%)	44
Diabetes (%)	40
Hypertension (%)	52
Cardiovascular Disease (%)	28
Types of Surgery	
Colectomy (%)	62

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Proctectomy (%)	23
Rectosigmoid Resection (%)	15

Table 2: Postoperative Complications

Complication	Percentage (%)
Surgical Site Infection (SSI)	18
Anastomotic Leakage	10
Postoperative Ileus	15
Pneumonia	9
Deep Vein Thrombosis (DVT) / Pulmonary Embolism (PE)	5
Acute Kidney Injury (AKI)	6
Total Patients with Complications	**47**

Table 3: Readmission Rates and Causes

Readmission Cause	Percentage (%)
Total Readmission Rate	22
Infectious Complications (SSI, Pneumonia)	40.9
Gastrointestinal Complications (Ileus, Obstruction, Leak)	36.4
Thromboembolic Events (DVT/PE)	13.6
Acute Kidney Injury & Electrolyte Imbalance	9.1

Table 4: Mortality and Length of Stay

Outcome	Value
In-Hospital Mortality Rate	3%
Median Length of Stay (days)	9 (IQR: 7–13)

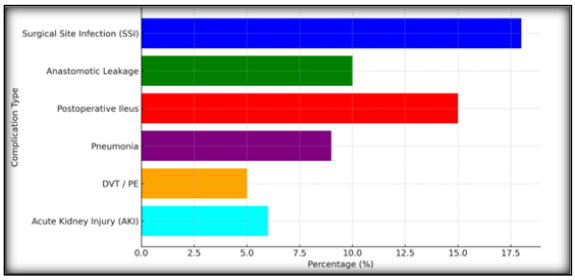

Figure 1: Postoperative Complications in Elderly Patients Undergoing Colorectal Surgery

Figure 2: Readmission Rates and Causes in Elderly Patients Undergoing Colorectal Surgery

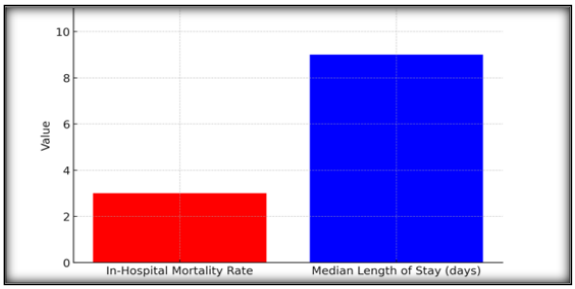

Figure 3: Mortality and Length of Stay in Elderly Patients Undergoing Colorectal Surgery

DISCUSSION

This study analyzed postoperative complications and 30-day readmission rates in elderly patients undergoing colorectal surgery. The findings highlight the significant burden of postoperative morbidity in this population, emphasizing the need for improved perioperative care strategies. Previous studies have similarly documented the challenges associated with surgical outcomes in elderly patients, particularly in colorectal procedures (González-Senac et al, Fagard et al).[8-14]

Postoperative Complications in Elderly Patients: Nearly half (47%) of the patients in this study experienced at least one postoperative complication, with surgical site infections (18%), postoperative ileus (15%), and anastomotic leakage (10%) being the most frequently observed. These findings align with prior research indicating that age-related physiological changes, immunosuppression, and multiple comorbidities contribute to an increased risk of complications (Wick et al, Andras et al).[8,10] In particular, diabetes and cardiovascular disease were identified as significant risk factors, supporting previous findings that suggest these conditions impair wound healing and increase susceptibility to infections (Tevis et al).[9]

Readmission Rates and Causes: The 30-day readmission rate was 22%, with infectious complications (40.9%) and gastrointestinal complications (36.4%) being the leading causes. These findings are consistent with previous studies reporting that surgical site infections, pneumonia, and gastrointestinal dysfunction are the primary drivers of hospital readmissions following colorectal surgery (D'Souza et al, Greenblatt et al).[11,13] Unplanned readmissions not only increase healthcare costs but also negatively impact long-term survival

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and quality of life (Normann et al).[12] Prior meta-analyses have suggested that implementing structured follow-up and early complication detection could reduce preventable readmissions (D'Souza et al).[11]

Mortality and Length of Hospital Stay: The in-hospital mortality rate was 3%, which is within the expected range for elderly patients undergoing major abdominal surgery. The median hospital stay was 9 days (IQR: 7–13 days), with longer durations observed in patients who developed complications. This aligns with findings by Normann et al,[12] who reported increased mortality and prolonged hospitalization in elderly patients with postoperative complications. Extended hospital stays not only increase the risk of nosocomial infections and thromboembolic events but also lead to higher healthcare expenditures (Tevis et al, Wick et al).[8,9]

Clinical and Healthcare Implications: The high complication and readmission rates observed in this study underscore the importance of preoperative risk assessment and perioperative optimization in elderly patients. Previous studies have recommended enhanced recovery after surgery (ERAS) protocols, prophylactic antibiotic administration, early mobilization, and nutritional support as effective strategies to reduce postoperative morbidity (González-Senac et al, Fagard et al).[8,14] Additionally, structured discharge planning, patient education on early signs of complications, and timely follow-up visits have been shown to significantly lower readmission rates (Andras et al, Greenblatt et al).[10,13]

Strengths and Limitations: A major strength of this study is its population-based approach conducted in a real-world clinical setting, providing valuable insights into postoperative outcomes in elderly patients. However, the study is limited by its small sample size (100 patients), and findings may not be generalizable to larger populations. Additionally, long-term outcomes beyond 30 days were not assessed, which could provide further understanding of recovery trajectories. Future studies with larger sample sizes and extended follow-up periods are needed to validate these findings and explore strategies for improving outcomes.

CONCLUSION

This study highlights the high prevalence of postoperative complications and 30-day readmission rates in elderly patients undergoing colorectal surgery. Nearly half of the patients experienced complications, with surgical site infections, postoperative ileus, and anastomotic leakage being the most common. The 30-day readmission rate was 22%, primarily due to infectious and gastrointestinal complications. The in-hospital mortality rate was 3%, and the median hospital stay was 9 days. These findings emphasize the need for enhanced perioperative care, early complication detection, and structured discharge planning to reduce morbidity and readmissions. Implementing strategies such as ERAS protocols, close postoperative monitoring, and patient education can improve outcomes and reduce healthcare burdens in this high-risk population.

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