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DETERMINANTS OF PERIOPERATIVE OUTCOMES IN COLORECTAL SURGERY: THE ROLE OF COMORBIDITY AND CONGESTIVE HEART FAILURE

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ABSTRACT

Purpose of study: to assess how aging and comorbidities affect outcomes in patients who underwent surgery for colorectal cancer (CRC) treatment, specifically looking at the impact of age, sex, and comorbidities on length of stay, readmission rates, reoperation rates, and overall survival. The study aimed to identify risk factors for adverse outcomes in older patients with CRC and provide insights into appropriate perioperative management strategies to improve surgical outcomes in this population. Methods of study: The incidence of surgical interventions in elderly patients with concomitant chronic conditions has been increasing. As such, this study aimed to assess how aging and comorbidities affect outcomes in patients who underwent surgery for colorectal cancer (CRC) treatment in the Samarkand State Medical University, multidisciplinary clinic-1. This retrospective cohort study involved patients aged 40 and above who underwent elective or urgent CRC surgical resection between January 2021 and December 2022. The study analyzed independent variables such as age, sex, and comorbidities, as well as variables associated with the surgical procedure, such as stoma creation, hospitalization history, surgical approach, American Society of Anesthesiologists (ASA) score, and Charlson Comorbidity Index score. A total of 96 patients with CRC underwent surgical resection. The patient's age had a significant impact on both pre- and post-resection length of stay (LOS) as well as overall survival (OS), but not on 30-day readmission and reoperation rates. Multivariate analysis revealed that age was a risk factor for longer preoperative and postoperative LOS, as well as

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for 30-day and 365-day mortality, but it was not associated with an increased risk of 30-day reoperation and readmission.

Results: The study also found that Chronic Heart Failure increased the 30-day mortality risk by four times, preoperative LOS by 51%, and postoperative LOS by 33%, while Chronic renal failure was associated with a 74% higher 30-day readmission rate.

Conclusion: The findings suggest that advanced age and comorbidities require a careful preoperative evaluation and appropriate perioperative management to improve surgical outcomes in older patients undergoing elective or urgent CRC resection. These results have significant implications for clinicians and healthcare providers involved in the management of elderly patients with CRC.

Keywords: Aging, Comorbidities, Colorectal surgery, Surgical resection, Length of stay, Mortality, Perioperative management

The Relevance of Research

Colorectal cancer (CRC) is a major health concern worldwide, with incidence rates expected to rise due to an aging population and longer life expectancies [1,3,5]. Despite a decline in CRC-related mortality rates, patients in older age groups exhibit an irregular pattern of mortality, potentially influenced by factors such as comorbidities, physiological reserves, social/cognitive status, and cancer stage at diagnosis [2,4]. By 2030, the majority of patients with cancer will be over 65 years old, and older patients tend to have poorer surgical outcomes than their younger counterparts. Thus, an individualized, comprehensive preoperative assessment that considers all comorbidities and a multidisciplinary approach is necessary to ensure appropriate care for older CRC patients [5,6]. This study aims to evaluate the impact of age and multimorbidity on peri- and postoperative outcomes in patients who underwent surgical resection for CRC, with the ultimate goal of improving patient care and surgical outcomes. By understanding the epidemiology of multimorbidity, more effective healthcare models can be designed to treat patients with multiple morbidities based on a benefit/risk assessment [7-10].

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The Purpose of Study

The study aimed to identify risk factors for adverse outcomes in older patients with CRC and provide insights into appropriate perioperative management strategies to improve surgical outcomes in this population.

Methods and Sources

This study was conducted in the Samarkand State Medical University, multidisciplinary clinic-1, which has a population of approximately 200 and provides universal healthcare. The primary source of information was the discharge dataset from regional hospitals, which included patient demographic data, admission and discharge dates, diagnosis codes, surgical procedure codes, American Society of Anesthesiologists score, Barthel index for activities of daily living, and information from death certificates. The study also utilized the Johns Hopkins ACG® System, a tool for population health management that converts patient data into actionable information. The study included patients aged 40 or older who were admitted to any hospital in Veneto with a diagnosis of primary colon or rectal cancer and underwent urgent or elective surgery between January 2021 and December 2022. Exclusion criteria included cancer of the anus, prior surgical resection before January 1, 2021, and ostomy surgery before the index hospitalization. The study used ICD-9-CM codes for disease and surgical procedure classification and record-linkage was performed on anonymized records to protect patient privacy.

Results of Research

The study's primary outcomes were the length of hospital stay (LOS) before and after surgery, 30-day readmission rate, 30-day reoperation rate, and overall survival (OS). The preoperative LOS was defined as the time between admission and surgery, while the postoperative LOS was the time between surgery and discharge. Any unplanned hospitalization within 30 days of discharge was considered a 30-day readmission, and any unplanned procedure within 30 days of the surgery was considered a 30-day reoperation. OS was defined as death from any cause within 365 days after surgery. The pre- and post-hospitalization periods were defined as ≤4 and ≤8 days, respectively (see Table 1 for details).

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Table 1

Outcome measures by age class						
	Total (%)	Age class				P value
		40–64 years (%)	65–74 years (%)	75–84 years (%)	85+ years (%)	
Preoperative LOS ≥ 4 days*	15.9	9.4	12.3	19.6	30.9	< 0.001
Postoperative LOS ≥ 8 days*	49.5	37.6	47.5	55.7	65.9	< 0.001
30-day reoperation	7.1	7.2	6.6	6.8	5.4	0.681
30-day readmission	5.5	4.6	5.9	5.9	5.6	0.045
365-day mortality	11.7	5.1	8.5	15.0	27.1	< 0.001

These outcomes are frequently utilized as indicators to evaluate the quality of perioperative care as they can be readily obtained from administrative databases.

In this analysis, patient age at the time of surgery was recorded and divided into four age categories (40-64, 65-74, 75-84, and 85+ years). To evaluate and predict the outcomes of interest, we also considered several additional covariates, including the approach used for surgery (open or laparoscopic), gender (male or female), Barthel Index Code (0-50 indicating dependence, 55-100 indicating independence), surgical complexity, and comorbidity indexes. Surgical complexity was assessed based on non-colorectal surgical procedure-related hospitalizations in the year preceding the index hospitalization, hospitalizations for non-colorectal abdominal surgery in the three years preceding the index hospitalization, and stoma creation during the index hospitalization. Comorbidities were evaluated using two indexes: the Charlson Index, calculated for the three years preceding the index hospitalization, and several ACG metrics used to quantify the burden of morbidity (i.e., the number of comorbidities) and identify the primary chronic conditions affecting each patient (including hypertension, lipid metabolism disorders, diabetes, osteoporosis, asthma, depression, glaucoma, congestive heart failure,

hypothyroidism, chronic renal failure, chronic obstructive pulmonary disease, dementia, Parkinson's disease, degenerative maculopathy, and rheumatoid arthritis). The number of comorbidities was calculated based on the Expanded Diagnosis Clusters (EDCs) assigned to the patient by the ACG system, which are diagnostic groupings describing a pathology or related pathologies based on the involved organ or apparatus.

A significance level of $P < 0.05$ was used to determine statistical significance. The statistical analyses were conducted using Stata software (Stata Corporation, Stata Statistical Software: Release 13.0, College Station, TX) [11].

Result and Discussion

Within the study timeframe, a total of 96 individuals aged 40 years and above and residing in SamSMU underwent elective or urgent primary resection for CRC.

The patient characteristics are summarized in Table 1. Our analysis revealed that elective surgery was performed in 87.6% and 59.3% of patients in the 40–64 year and 85+ year age groups, respectively, which was statistically significant ($P < 0.01$).

Table 2

Main characteristics of study patients by age class

	Total 96 n	**Age class**			
		40– 64 year (%)	**65- 74 year(%)**	**75– 84 year(%)**	**85+ year(%)**
Gender					
Male	60	(55.4)	(61.3)	(55.8)	(41.8)
Female	36	(40.6)	(38.7)	(44.2)	(58.2)
Admission modality					
Emergent/urgent	52	(12.4)	(14.4)	(23.3)	(40.7)
Elective	44	(87.6)	(85.6)	(76.7)	(59.3)
Hospitalization in the year before the index surgery					

In a study, it was found that 22.7% of patients between the ages of 40 and 64 had three or more comorbidities, while 67.5% of patients aged 85 and above had the same. The Barthel Index at hospital admission showed that younger patients were more independent in carrying out ADL, while higher (worse)

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values were associated with increasing age. The laparoscopic approach was used more frequently in younger patients, with 55.3% of patients aged 40-64 undergoing the procedure compared to 24.4% of patients aged 85 and above. Most patients were discharged directly to their homes, but there was an age-related correlation with the highest proportion of patients being discharged to non-home settings in the oldest age groups (10.6% in 85+ years class compared to 0.9% in 40-64 years class).

Discussions

Several studies have found that advanced age and pre-existing cardiac issues increase the risk of postoperative complications in older patients with CRC [1-5]. However, our study found that age did not affect 30-day reoperation and 30-day postoperative readmission rates in our cohort. Instead, we found a significant association between comorbidities such as Diabetes, Dementia, Hypothyroidism, and CRF, and 30-day postoperative readmission. It is important to identify comorbidities in cancer patients requiring surgical resection as surgical and systemic oncological treatments can stress the physiological reserves of older patients. Additionally, older patients with CRC have lower cancer-related survival rates, which may be due to less aggressive treatment. Pre-habilitation programs, fast track protocols, or ERAS bundles can have positive effects on outcomes for older patients undergoing surgical tumor resection. However, our study has limitations such as a lack of information on cancer stage, chemotherapy/radiotherapy treatments, comorbidity severity, and risk factor management.

Conclusion

The analysis of the data confirmed that advanced age had an impact on both short- and long-term outcomes for older patients who underwent surgical treatment for CRC. To improve prognostic analysis and determine the risk-benefit ratio, it is important to conduct a thorough pre-surgical assessment of the patient's comorbidities. This approach will aid in the selection of the most appropriate therapeutic option for CRC patients with multiple medical conditions. Future studies should consider the patient's cancer stage, severity of comorbidities, and other risk factors to gain a more comprehensive understanding of disease complexity.

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REFERENCES

1. Матлубов М. М., Нематуллоев Т. К., Хамдамова Э. Г. КОРРЕКЦИЯ ГИПОТЕНЗИИ, ВЫЗВАННОЙ СПИНАЛЬНОЙ АНЕСТЕЗИЕЙ //Интернаука. – 2021. – Т. 18. – №. 194 часть 1. – С. 75.
2. МАТЛУБОВ М. М., НЕМАТУЛЛОЕВ Т. К. Состояние гемодинамики во время спинальной и эпидуральной анестезии у пациентов с повышенным индексом массы тела при колопроктологических операциях //журнал биомедицины и практики. – 2022. – Т. 7. – №. 2.
3. Матлубов М. М., Гойибов С. С. ОПТИМИЗАЦИЯ ПРЕДОПЕРАЦИОННОЙ ПОДГОТОВКИ У БОЛЬНЫХ С САХАРНЫМ ДИАБЕТОМ ПРИ ПРОКТОЛОГИЧЕСКИХ ОПЕРАЦИЯХ //International scientific review. – 2020. – №. LXXV. – С. 66-70.
4. Гойибов С. С. УСОВЕРШЕНСТВОВАНИЕ АНЕСТЕЗИИ У ПОЖИЛЫХ БОЛЬНЫХ С САХАРНЫМ ДИАБЕТОМ ПРИ ОПЕРАЦИЯХ МАЛОГО ТАЗА //Вестник науки и образования. – 2022. – №. 10-2 (130). – С. 65-69.
5. Гойибов С. С. ОПТИМИЗАЦИЯ АНЕСТЕЗИИ У БОЛЬНЫХ ПОЖИЛОГО ВОЗРАСТА С САХАРНЫМ ДИАБЕТОМ ПРИ ОПЕРАЦИЯХ ПАХОВЫХ ГРЫЖ //Проблемы науки. – 2022. – №. 5 (73). – С. 99-103.
6. Жониев С. Ш. и др. Использование модифицированного метода предоперационной подготовки и анестезии в хирургии щитовидной железы //International scientific review of the problems of natural sciences and medicine. – 2019. – С. 175-186.
7. Sharma A. et al. Tobacco smoking and postoperative outcomes after colorectal surgery //Annals of surgery. – 2013. – Т. 258. – №. 2. – С. 296-300.
8. Poon R. T. et al. Improving perioperative outcome expands the role of hepatectomy in management of benign and malignant hepatobiliary diseases: analysis of 1222 consecutive patients from a prospective database //Annals of surgery. – 2004. – Т. 240. – №. 4. – С. 698.
9. Poelemeijer Y. Q. M. et al. Obesity as a determinant of perioperative and postoperative outcome in patients following colorectal cancer surgery: a population-based study (2009–2016) //European Journal of Surgical Oncology. – 2018. – Т. 44. – №. 12. – С. 1849-1857.
10. Matlubov M., Nematulloev T. MAIN HEMODYNAMIC PATTERNS IN OVERWEIGHT PATIENTS DURING PROCTOLOGICAL SURGERY //Science and Innovation. – 2022. – Т. 1. – №. 6. – С. 263-270.

ResearchJet Journal of Analysis and Inventions
https://reserchjet.academiascience.org

11. Matlubov M. M. et al. Optimization of the anesthetic approach in coloproctological operations in patients with concomitant cardiovascular disease //Dostizheniya nauki i obrazovaniya. – 2019. – T. 12. – C. 53.
12. Marusch F. et al. The impact of the risk factor "age" on the early postoperative results of surgery for colorectal carcinoma and its significance for perioperative management //World journal of surgery. – 2005. – T. 29. – C. 1013-1021.
13. Leeds I. L. et al. Increased healthcare utilization for medical comorbidities prior to surgery improves postoperative outcomes //Annals of surgery. – 2020. – T. 271. – №. 1. – C. 114.
14. Lee Y. H. et al. Use of a comprehensive geriatric assessment to predict short-term postoperative outcome in elderly patients with colorectal cancer //Annals of coloproctology. – 2016. – T. 32. – №. 5. – C. 161.