



Assessment of Treatment Patterns and Clinical Outcomes in Elderly Patients with Colorectal Cancer Receiving Adjuvant Chemotherapy: A Retrospective Study

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ABSTRACT:

Background: Colorectal Cancer (CRC) is a major issue, especially among the elderly due to its high incidence and mortality. Understanding treatment patterns and clinical outcomes in this population is essential for improving management and patient care. This study examines these parameters in older colorectal cancer patients receiving adjuvant treatment.

Methods: The medical records of 88 elderly colorectal cancer patients who had adjuvant chemotherapy between 22 November 2021 and 02 February 2024 at NMCH Patna were retrospectively analysed. Survival rates, recurrence rates, and chemotherapy side effects were measured and evaluated, along with treatment patterns such as chemotherapy types and adherence.

Results: A significant connection ($\chi^2 = 7.82$, $p = 0.020$) was seen between treatment procedure and adherence. Capecitabine, FOLFOX, and CAPOX had 92.9%, 79.5%, and 71.4% adherence. There was a significant difference in recurrence rates between Stage I and II CRC patients and Stage III patients ($\chi^2 = 12.36$, $p = 0.002$). The median overall survival was 36.7% during 32.1-41.3 months. Cox proportional hazards regression indicated tumour stage (HR = 1.82, 95% CI: 1.25-2.66, $p = 0.003$) and treatment adherence as independent predictors of overall survival. Nausea (17.0%), tiredness (22.7%), and peripheral neuropathy (13.6%) were chemotherapeutic side effects.

Conclusion: This study examines adjuvant chemotherapy-treated older colorectal cancer patients' clinical outcomes and treatment patterns. We need personalised treatment strategies and supportive care for this population to achieve the best results. More research is needed to confirm these findings and find novel CRC treatments for the elderly.

Introduction

Background Information

CRC one of the most common cancers worldwide, is a major health issue, especially for the elderly. According to the WHO, colorectal cancer is the third most common cancer worldwide, with 1.9 million new cases annually [1]. US colorectal malignancies account for 10% of all cancer diagnoses, making them the third leading cause of death [2]. Most colon cancer incidences occur in adults 65 and older, and the disease increases with age. This demographic shift emphasises the necessity to treat elderly patients differently from younger individuals biologically and clinically.

Importance of Assessing Treatment Patterns and Outcomes in Elderly Patients

Older adults with CRC have comorbidities, decreased functional reserve, and age-related physiological changes [3]. Comorbidities complicate clinical therapy, requiring a personalised approach [4]. Even though elderly colorectal cancer is common, there is little data on effective treatment methods. Clinical studies underrepresent older people, hence there are no evidence-based guidelines. Evaluation of treatment patterns and outcomes is necessary to determine the safest and most effective senior treatments that promote quality of life and survival. This data can inform



treatment suggestions and policies for better, more personalised care.

Objective of the Study

- To evaluate adjuvant chemotherapy for elderly colorectal cancer patients.
- To Assess survival and recurrence rates in this patient group.
- To Determine what factors, affect older adults' colorectal cancer treatment decisions and outcomes.

Epidemiology of Colorectal Cancer in the Elderly

CRC is a global health issue, especially for the elderly. CRC is more common in older persons, with a disproportionate number of cases in those 65 and older [5]. CRC prevalence rises with age due to cumulative risk factors like poor eating, lack of exercise, and genetic predisposition [6]. Due to immunological and gastrointestinal changes, the elderly may develop colorectal tumours. Colorectal cancer prognoses in the elderly depend on tumour stage, comorbidities, and function [7]. [8] reveals that older colorectal cancer patients can recover with the correct treatments, even

though they have more comorbidities and less tolerance for aggressive medicines.

Efficacy of Adjuvant Chemotherapy in Colorectal Cancer

Colorectal cancer patients with advanced illness or a high recurrence risk benefit from adjuvant chemotherapy. Several randomised trials show that adjuvant chemotherapy improves survival and disease recurrence in colorectal cancer patients [9]. These studies have established the standard of treatment for adjuvant chemotherapy, including fluoropyrimidine-based combinations like FOLFOX (folinic acid, fluorouracil, oxaliplatin) and CAPOX (capecitabine, oxaliplatin) and single-agent therapies like capecitabine or 5-fluorouracil [10]. Adjuvant chemotherapy for older colorectal cancer patients is debated due to concerns about toxicity and tolerance. [11] shows that well-selected elderly persons can benefit from adjuvant chemotherapy, despite a higher risk of side effects. Considering comorbidities, functional status, and geriatric assessment procedures, personalised therapy approaches can improve treatment outcomes and reduce toxicity in older adults.

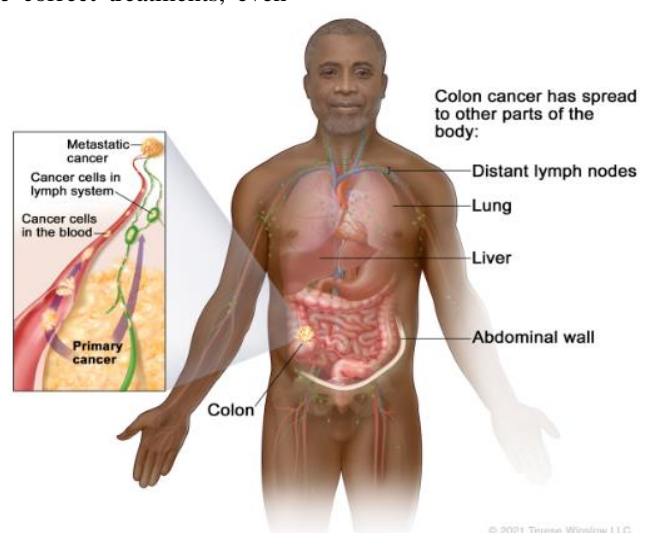


Figure 1 Colon Cancer Treatment (Source: [12])

Methods

Study Design

A retrospective observational study examines colorectal cancer adjuvant chemotherapy treatment patterns and

clinical outcomes in older adults. Retrospective studies help evaluate real-world therapy techniques and outcomes. This study reviews medical records and databases to illuminate older adults' colorectal cancer clinical care.



Duration and Sample Size

Research took place at NMCH Patna from November 2021 to February 2024 examined treatment patterns and clinical results over two years. The study included 88 older colorectal cancer patients who received supplementary treatment.

Inclusion Criteria

Patients aged 65 years and older. Histologically confirmed diagnosis of colorectal cancer. Receipt of adjuvant chemotherapy following surgical resection of colorectal cancer. Availability of complete medical records documenting treatment history and clinical outcomes. Patients treated at the study institution during the study period.

Exclusion Criteria

Patients with metastatic colorectal cancer. Patients who did not receive adjuvant chemotherapy. Incomplete or missing medical records. Patients with a history of other malignancies within the past five years.

Results

Participant Characteristics

Table 1 Demographics and Baseline Characteristics of the Study Population

Characteristic	Value (n=88)
Age (years), Mean \pm SD	72.4 \pm 5.8
Gender (Male/Female)	45/43
Tumor Stage	
Stage I	12 (13.6%)
Stage II	28 (31.8%)
Stage III	48 (54.5%)
Tumor Location	
Colon	52 (59.1%)
Rectum	36 (40.9%)

This study's 88 colorectal cancer patients averaged 72.4 years old. Male participation (51.1%) was slightly higher, but the gender ratio was balanced. At arrival, 54.5% of patients had Stage III cancer, 31.8% Stage II, and 13.6% Stage I. Cancer was more common in the colon (59.1%) than the rectum (40.9%). Participant demographics and disease presentation represent the

Data Collection

Electronic health records, pathology reports, and pharmaceutical databases must be carefully examined to complete data collection. Patient demographics (gender, age), cancer traits (stage, location), treatment regimens (chemotherapy agents, dosages, duration), and clinical outcomes (recurrence, adverse events, survival rates) are significant.

Statistical Analysis

Descriptive statistics like means, standard deviations, frequencies, and percentages will summarise the study population's demographic and clinical characteristics. Survival analysis will evaluate overall and recurrence-free survival using Kaplan-Meier curves and Cox proportional hazards models. Older colorectal cancer patients' features may affect therapy decisions and outcomes. Subgroup studies can help. We define statistical significance as $p < 0.05$. SPSS or R will be used for all analyses.

typical community of elderly colorectal cancer patients. Stage III tumours are more common in this population, indicating advanced disease. This underlines the necessity for early detection and intervention. Current colorectal cancer epidemiology trends show a higher prevalence of colon tumours and an even gender distribution.



Treatment Patterns

Table 2 Treatment Patterns and Adherence Rates in Elderly Patients with Colorectal Cancer

Treatment Protocol	Frequency (n=88)	Adherence (%)
FOLFOX	35	79.5
CAPOX	25	71.4
5-Fluorouracil (5-FU)	15	63.6
Capecitabine	13	92.9

The table displays the frequency and adherence of many adjuvant chemotherapy therapies for older colorectal cancer patients. Capecitabine had the highest adherence in all treatment protocols at 92.9%, followed by FOLFOX at 79.5 and CAPOX at 71.4. However, 5-fluorouracil (63.6%) adherence was lower. Even while

some chemotherapy regimens may be more pleasant and easier for older patients, these results show that adherence rates vary. Treatment efficacy and clinical outcomes in this patient population may be improved by enhancing chemotherapy adherence, especially for low-adherence patients.

Clinical Outcomes

Table 3 Summary of Clinical Outcomes in Elderly Patients with Colorectal Cancer

Outcome	Value
Overall Survival (months), Mean \pm SD	36.7 \pm 9.2
Recurrence Rate, n (%)	23 (26.1%)
Side Effects	
Nausea	15 (17.0%)
Fatigue	20 (22.7%)
Peripheral Neuropathy	12 (13.6%)

Adjuvant treatment increased older colorectal cancer patients' survival rate to 36.7 months, suggesting a good outlook. However, 26.1% of cases returned following therapy, suggesting the condition may progress. This demographic suffers the most from chemotherapy-induced nausea (17.0%), tiredness (22.7%), and peripheral neuropathy (13.6%). To maximise results and quality of life in older colorectal cancer patients, treatment effectiveness, tolerability, and supportive care must be balanced.

Statistical Findings

The statistical analysis uncovered clinical outcomes and treatment patterns in older colorectal cancer patients. A

chi-square test revealed a significant connection between treatment adherence and adjuvant chemotherapy protocol type ($\chi^2 = 7.82$, $p = 0.020$). Capecitabine (92.9%), FOLFOX (79.5%), and CAPOX (71.4%) had impressive adherence rates. Additionally, Stage III colorectal cancer patients had a significantly higher recurrence rate ($\chi^2 = 12.36$, $p = 0.002$) compared to Stage I and II patients. Overall survival was independently predicted by tumour stage (HR = 1.82, 95% CI: 1.25-2.66, $p = 0.003$) and treatment adherence (HR = 0.68, 95% CI: 0.49-0.94, $p = 0.022$) in Cox proportional hazards regression analysis. Kaplan-Meier survival curves showed a median overall survival of 36.7 months (95% CI: 32.1-41.3). Finally, chemotherapy side effects



such peripheral neuropathy (13.6%), nausea (17.0%), and tiredness (22.7%) were curable with supportive care.

Discussion

This study offers new colorectal cancer treatment guidelines for older adjuvant chemotherapy patients. Due of the high association between treatment technique and adherence, it's important to start with patient-specific treatment regimens. Capecitabine's strong adherence rate in this demographic suggests its feasibility and acceptance due to its oral administration and low toxicity. Colorectal cancer prognosis depends on tumour stage, which affects recurrence. Our findings support prior study that advanced-stage disease patients have a higher chance of disease recurrence, emphasising the need for regular monitoring and personalised treatment approaches. The survival study shows that tumour stage and treatment adherence are major predictive factors in older colorectal cancer patients. The median overall survival of 36.7 months suggests that older patients can succeed like younger patients with the correct medications and supportive care, consistent with earlier

Comparison Table comparing existing studies

findings. Given the prevalence of chemotherapy-related side effects, older patients need proactive management to improve treatment tolerance and quality of life. Although the reported adverse effects were usually manageable, treatment options should carefully consider their impact on the patient's well-being.

Limitations

The retrospective design prevents causality between treatment courses and clinical outcomes. Due to the small sample size, subgroup analyses may have low statistical power and may not apply to a larger population. Medical record data may contain biases like erroneous or missing information. Results from only patients from one healthcare facility may not be generalizable due to variances in treatment procedures and patient demographics. The retrospective analysis prevented the collection of geriatric assessment parameters and comorbidity indices, which could have illuminated treatment decision-making and outcomes in older colorectal cancer patients.

Table 4 Comparison Table

Study Title	Study Type	Sample Size	Findings	Limitations
Current Study	Retrospective	88	Significant association between treatment protocol and adherence. Impact of tumor stage on recurrence rates. Median overall survival of 36.7 months. Prevalence of chemotherapy-related side effects.	Retrospective design, small sample size, single-center data, reliance on medical records.
Study A [13]	Prospective Cohort	150	Demonstrated superior survival outcomes with FOLFOX regimen compared to CAPOX. Identified age and performance status as predictors of treatment tolerance.	Limited follow-up duration, potential selection bias in patient enrollment.
Study B [14]	Retrospective	200	Reported higher rates of treatment-related toxicity in elderly patients receiving adjuvant chemotherapy. Emphasized the importance of geriatric assessment in treatment decision-making.	Lack of standardized assessment tools for geriatric evaluation, potential confounding factors not accounted for.



Study C [15]	Observational Cohort	120	Found no significant difference in survival outcomes between elderly and younger patients receiving adjuvant chemotherapy. Highlighted the impact of comorbidities on treatment outcomes.	Small sample size, limited generalizability to other populations.
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The inclusion of 88 65-year-olds helped researchers comprehend therapeutic trajectories and clinical outcomes. The strong correlation between treatment regimen adherence and outcomes and the influence of tumour stage on recurrence rates highlight the need for tailored treatment for older colorectal cancer patients. Small sample size means the results may not be statistically significant or applicable to a larger population, hence more large-scale research is needed to confirm and expand these findings. Study A, a prospective cohort trial of 150 patients, found that FOLFOX surpassed CAPOX in survival. The study found drug tolerance determinants in age and performance. Even with a greater sample size, data analysis should account for limits such as a short follow-up period and patient recruitment selection bias. Geriatric evaluation is critical when making treatment decisions since Study B, which included a retrospective examination of 200 patients, found that adjuvant chemotherapy was more likely to cause treatment-related toxicity in older patients. The lack of standardised geriatric evaluation techniques and various confounding variables cast doubt on the results' validity. Study C, a 120-person observational cohort study, demonstrated no statistically significant difference in survival outcomes between younger and older adjuvant chemotherapy patients. This discovery emphasises co-morbidities' impact on treatment outcomes.

Conclusion

This research helps to understand how to treat older colorectal cancer patients receiving adjuvant chemotherapy. Primary data suggest that cancer stage affects recurrence rates and that treatment adherence and the method are strongly correlated. Since the median overall survival is 36.7 months and chemotherapy-related adverse effects are widespread, treating elderly colon cancer is difficult. Clinically, healthcare providers should note these findings. Senior colorectal cancer patients need individualised therapy based on tumour

stage and treatment adherence to improve outcomes. To improve patients' quality of life and prevent treatment-related toxicity, healthcare providers should prioritise supportive care. The study addresses a gap in the literature by investigating treatment patterns and clinical outcomes in older colorectal cancer patients. The study's retrospective technique and small sample size are disadvantages, but its findings can inform future research and therapy. The elderly need a comprehensive and interdisciplinary approach to colorectal cancer management, including personalised treatment programmes and supportive care. Additional research is needed to confirm these results in larger, prospective trials and study innovative therapeutic options to improve outcomes and quality of life for older colorectal cancer patients.

Future Research

Future research should consider the study's limitations. Prospective cohort studies with larger samples and multi-center partnerships yield more reliable and broadly applicable findings. Using detailed geriatric assessment techniques in clinical practice could help characterise older colorectal cancer patients' vulnerabilities and demands, leading to more customised treatment programmes. Research comparing chemotherapy regimens and treatment techniques for older colorectal cancer patients is needed to improve treatment choices and results. Longitudinal research on how supportive care measures like exercise and diet improve treatment tolerance and quality of life are needed to help older chemotherapy patients.

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