

Early Postoperative Complications and Mortality in Patients Undergoing Colorectal Cancer Surgery and its Relation with Nutritional Status

Muhammad Azim Khan¹, Muzaffar Aziz², Ghulam Murtaza² and Khalid Hussain Qureshi²

ABSTRACT

Objective: The objective of this study was to determine the frequency of early postoperative complications and mortality in patients undergoing colorectal cancer surgery and its relation with nutritional status.

Study Design: Observational / descriptive study.

Place and Duration of study: This study was conducted at the Indoor Department of General Surgery, Nishtar Hospital Multan from 02-01-2016 to 01-12-2016

Materials and Methods: In this study, Sixty patients of either gender with 30-60 year of age admitted for major colorectal cancer surgery with cancer stage of \leq IIA were included in this study. We utilized hypoalbuminemia to recognize dietary status. All patients having resection of their rectum underwent mesorectal extraction, and patients with colorectal or coloanal anastomosis had a twofold stapled anastomosis. A SSI case was recognized utilizing CDC, USA definition, which expresses that "Wound would be viewed as surgical site infection if it happens inside 30 days of procedure and has any one of the accompanying: purulent discharge from the injury, agony or delicacy, restricted swelling, redness, malodor, fever".

Results: Age range in this study was 30-60 years with mean age 48.500 ± 5.37 years, mean BMI 28.116 ± 1.84 Kg/m² and mean duration of procedure was 3.066 ± 0.60 hours. Majority of patients according to age groups were belongs to 46-60 years and there was more males than females. Majority of patients were belongs to stage I of cancer 39(65%) and hypoalbuminemia was seen in 58.3% patients. Twenty-one (35%) patients developed surgical site infection. Mortality was seen in 7 (11.7%) patients. SSI and mortality was significantly seen in patients of IIA cancer stage ($p < 0.05$). Patients with hypoalbuminemia showed more frequency of SSI and mortality ($p < 0.05$).

Conclusion: Malnutrition is a more noticeable issue in colorectal cancer than other most basic cancer. Postoperative 30-day mortality and SSI were fundamentally connected with under nutrition in colorectal tumor.

Key Words: Colorectal cancer, Malnutrition, Surgical site infection, Mortality

Citation of article: Khan MA, Aziz M, Murtaza G, Qureshi KH. Early Postoperative Complications and Mortality in Patients Undergoing Colorectal Cancer Surgery and its Relation with Nutritional Status. Med Forum 2017;28(1):31-34.

INTRODUCTION

Absence of appropriate nourishment is a critical issue in cancer patients because of the joined impacts of malignant disease advance, the host reaction to the tumor, and related anticancer treatments.¹ The occurrence of lack of healthy sustenance among cancer patients contrasts essentially in various disease sorts and when measured by various screening tools.² Therefore, malnutrition has been related in all cancer sorts with poor anticipation and quality of life.³

¹. Department of Surgery, Ghazi Khan Medical College DG Khan

². Department of Surgery, Nishtar Medical College Multan.

Correspondence: Dr. Muhammad Azim Khan, Associate Professor of Surgery, Ghazi Khan Medical College DG Khan
Contact No: 0300-7331709
Email: azimkhan874@hotmail.com

Received: November 15, 2016; Accepted: December 10, 2016

Past studies had demonstrated that cancer has a significant physical and physiological effect in patients, particularly in what concerns to their nutritious status.⁴ Cancer related under nutrition had been considered frequently, influencing up to 85% of the patients and different causes had been viewed as like systemic impact of tumor, host reaction or auxiliary impacts of anticancer therapies.⁵

Gastrointestinal cancer had indicated higher malnutrition predominance; 30 to 60% of colorectal patients had been considered under nutrition.⁶ This can bring about longer hospital stay, diminished reaction to treatments, expanded complication to treatment and surgery procedures, reduced survival and higher expenses.

Particular cancer treatments and surgery strategies could be a vital component influencing wholesome status of hospitalized patients. A few changes had been done incorporating into what refers to negligibly intrusive surgery systems like the alleged fast track. Current information on this strategy for colonic surgery

had demonstrated enhanced body composition and additionally oral energy and protein consumption, when contrasted with conventional methods.

Moreover quick track surgery had been connected with less surgical stretch, bring down complication rate and decrease medical center stays which could add to prior rehabilitation.⁸

Research propose that ailing health is connected with antagonistic clinical results in patients with upper GI and colorectal cancer.⁹ Malnourished patients with GI growth, as with all malnourished surgical patients, have expanded rates of complications and mortality and longer medical facility admissions than well nourished patients.¹⁰ Apart from the clinical ramifications for the patient, these results eventually add to expanded healthcare costs.¹¹

Since ailing health and its related complications are a significant issue for surgical patients with colorectal tumor, more research is required to figure out if particular perioperative dietary practices and protocol can enhance results. In this manner, the present study is planned to determine the frequency of early postoperative complications and mortality in patients undergoing colorectal cancer surgery and its relation with nutritional status.

MATERIALS AND METHODS

Sixty patients of either gender and 30-60 year of age admitted for major colorectal cancer surgery with cancer stage of \leq IIA were included in this study. Pregnant women, patients with edema or ascites, amputees, and those with neurological and/or ostomized before the evaluated surgical procedure were excluded.

Colorectal tumor was analyzed by ICD-9 codes (V76.51).¹² We utilized hypoalbuminemia to recognize dietary status. Hypoalbuminemia was characterized as serum albumin levels under 3.5 g/dl. The essential result measures were postoperative complication in term of SSI and mortality in the 30-day after surgery.

The prophylactic anti-microbial regimen included cefoxitin 2 g IV 30-60 min preceding the procedure, and a second dosage of 1 g in the surgery room when the surgery was 4 hour or more. All patients having resection of their rectum underwent mesorectal extraction, and patients with colorectal or coloanal anastomosis had a twofold stapled anastomosis. The skin was shut with clips, which stayed for 7-10 days. Pain was controlled with an intravenous morphine sulfate, which was titrated by pain levels utilizing the Wong-Baker Faces torment scale. Patients were given feed when gas was passed, and routinely discharged on the ninth to eleventh post-surgery day. Wounds were covered in the operation room with a non-adherent spongy dressing.

A SSI case was recognized utilizing CDC, USA definition, which expresses that "Wound would be

viewed as surgical site infection if it happens inside 30 days of procedure and has any one of the accompanying: purulent discharge from the injury, agony or delicacy, restricted swelling, redness, malodor, fever". Information with respect to SSI and mortality was recorded.

Data was analyzed with statistical analysis program (IBM-SPSS version 20). Frequency and percentage was computed for qualitative variables like age groups, gender, stages of cancer, SSI and mortality. Mean \pm SD was presented for quantitative variables like age and duration of procedure. Stratification was done with regard to hypoalbuminemia and stages of cancer to see the effect of these variables on SSI and mortality. Post stratification using the chi-square test for both groups, $p \leq 0.05$ was considered statistically significant.

RESULTS

Age range in this study was 30-60 years with mean age 48.500 \pm 5.37 years, mean BMI 28.116 \pm 1.84 Kg/m² and mean duration of procedure was 3.066 \pm 0.60 hours. Majority of patients according to age groups were belongs to 46-60 years and there was more males than females. Majority of patients were belongs to stage-I of cancer 39(65%) and hypoalbuminemia was seen in 58.3% patients as shown in Table 1.

Twenty-one (35%) patients developed surgical site infection. Mortality was seen in 7 (11.7%) patients as shown in Table-I

SSI was significantly developed in patients of IIA cancer stage ($p=0.000$) as shown in Table-3.

Table-I Demographics of patients n=60

Demographics	
Mean Age (years)	48.500 \pm 5.37
Mean BMI (Kg/m ²)	28.116 \pm 1.84
Age groups	
30-45	15(25%)
46-60	45(75%)
Gender	
Male	44(73.3%)
Female	16(26.7%)
Stages of Cancer	
0	8(13.3%)
I	39(65%)
IIA	13(21.7%)
Hypoalbuminemia	
Yes	35(58.3%)
No	25(41.7%)
Mean Duration of procedure (hours)	3.066 \pm 0.60

Patients with hypoalbuminemia showed more frequency of SSI ($p=0.000$) as shown in Table-4

Mortality was significantly seen in patients of IIA cancer stage ($p=0.000$) as shown in Table-4.

Patients with hypoalbuminemia showed more frequency of mortality (p=0.017) as shown in Table-4.

Table No.2: Surgical Site Infection and Mortality n=60

Out Comes	Yes	No	Total
SSI	21(35%)	39(65%)	60(100%)
Mortality	7(11.7%)	53(88.3%)	60(100%)

Table No.3: Stratification of SSI with respect to stages of cancer

Stages of Cancer	Surgical Site Infection		p-value
	Yes	NO	
0	2(25%)	6(75%)	0.000
I	8(20.5%)	31(79.5%)	
IIA	11(84.6%)	2(15.4%)	
Total	21(35%)	39(65%)	

Table No4: Stratification of SSI with respect to Hypoalbuminemia

Hypo-albuminemia	Surgical Site Infection		p-value
	Yes	NO	
Yes	19(54.3%)	16(45.7%)	0.000
No	2(8%)	23(92%)	
Total	21(35%)	39(65%)	

Table No.5: Stratification of Mortality with respect to stages of cancer

Stages of Cancer	Mortality		p-value
	Yes	NO	
0	0(0%)	8(100%)	0.000
I	0(0%)	39(100%)	
IIA	7(53.8%)	6(46.2%)	
Total	7(11.7%)	53(88.3%)	

Table No.6: Stratification of Mortality with respect to Hypoalbuminemia

Hypo-albuminemia	Mortality		p-value
	Yes	NO	
Yes	7(20%)	28(80%)	0.017
No	0(0%)	25(100%)	
Total	7(11.7%)	53(88.3%)	

DISCUSSION

In this study, the mean age was 48.500±5.37 years and the most occurrence of colorectal cancer was in males were similar to those reported in the literature.^{13,14} But, different studies have demonstrated a higher rate of colorectal tumor in females.¹⁴⁻¹⁶

Physical idleness, overweight/corpulence and additionally insufficient eating methodologies are identified with the onset of colorectal cancer,^{17,18} as in study by Arafa et al.¹⁷ for a investigation of 220 patients with colorectal cancer who found that 81.8% of patients were inactive.

One of the reported difficulty is wound infection. Research suggest a rate of up to 26% in patients

experiencing colorectal surgery. In the present study, we found a 35% rate of wound infection, exhibiting the impact of the few components required in the advancement of this issue—among them, the patient himself and his present pathologies, surgical method, and perioperative variables. Aguiar-Nascimento et al.¹⁹ found a 7.1% rate of disease at the surgical site in 24 patients experiencing colorectal operations.

In our study, the malnutrition rate rate in colorectal tumor as characterized by hypoalbuminemia was same as the reports of other countries.²⁰⁻²³ A uniform, easily measured and very much qualified screening metric is expected to decide nutritional status in disease patients, hence making the potential for cross examination of data. Past studies concentrating on the relationship amongst hypoalbuminemia and postoperative result concentrated on long term survival and critical contrasts were occasionally noted in their multivariate analyses.²⁰⁻²³ In our study hypoalbuminemia was fundamentally connected with postoperative 30-day mortality and general morbidity including sepsis, renal failure, and cardiovascular events that had not been demonstrated before.²⁴ Smith, et al. reported that underweight status was fundamentally connected with 30-day mortality and the event of postoperative sepsis.²⁵

CONCLUSION

Malnutrition is a more noticeable issue in colorectal cancer than other most basic cancer. Postoperative 30-day mortality and SSI were fundamentally connected with under nutrition in colorectal tumor

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Gupta D, Vashi PG, Lammersfeld CA, Braun DP. Role of nutritional status in predicting the length of stay in cancer: a systematic review of the epidemiological literature. *Ann Nutr Metab* 2011; 59:96–106.
- Zhang L, Lu Y, Fang Y. Nutritional status and related factors of patients with advanced gastrointestinal cancer. *Br J Nutr* 2014;111: 1239–44.
- Huhmann MB, Cunningham RS. Importance of nutritional screening in treatment of cancer-related weight loss. *Lancet Oncol* 2005; 6:334–43.
- Varadhan KK, Neal KR, Dejong CHC, Fearon KCH, Ljungqvist O, et al. The enhanced recovery after surgery (ERAS) pathway for patients undergoing major elective open colorectal surgery: a meta-analysis of randomized controlled trials. *Clin Nutr* 2010; 29:434-40.

5. Cutsem E, Arends J. The causes and consequences of cancer-associated malnutrition. *Eur J Oncol Nurs* 2005;9 (Suppl 2):S51-63.
6. Burgos R, Sarto B, Elío I, Planas M, Forga M, Cantón A, et al. Prevalence of malnutrition and its etiological factors in hospitals. *Nutr Hosp* 2012; 27:469-76.
7. Sánchez MBG, Espín NVG, Álvarez CS, Ros AIZ, Hernández MN, Ramos MJG, et al. Apoyo nutricional perioperatorio en pacientes con neoplasia colorrectal support in patients with colorectal. *Nutr Hosp* 2010; 25:797-805.
8. Kehlet H. Fast-track colonic surgery: status and perspectives. recent results in cancer research. *fortschritte der krebsforschung. Progrès dans les recherches sur le cancer* 2005; 165:8-13.
9. Rey-Ferro M, Castano R, Orozco O, Serna A, Moreno A. Nutritional and immunologic evaluation of patients with gastric cancer before and after surgery. *Nutrition* 1997; 13:878-81.
10. Isabel M, Correia TD, Waitzberg DL. The impact of malnutrition on morbidity, mortality, length of hospital stay and costs evaluated through a multivariate model analysis. *Clin Nutr* 2003; 22:235-9.
11. Middleton MH, Nazarenko G, Nivison-Smith I, Smerdely P. Prevalence of malnutrition and 12-month incidence of mortality in two Sydney teaching hospitals. *Int Med J* 2001; 31:455-61.
12. Special screening for malignant neoplasms of colon. 2012 ICD-9-CM diagnosis code V76.51[internet]. CM Diagnosis Codes; [cited 2016 Oct 02]. Available from URL: <http://www.icd9data.com/2012/Volume1/V01-V91/V70-V82/V76/V76.51.htm>.
13. Telem DA, Chin EH, Nguyen SQ, Divino CD. Risk factors for anastomotic leak following colorectal surgery. a case control study. *Arch Surg* 2010; 145(4):371-76.
14. Valadao M, Leal RA, Barbosa LC, Carneiro M, Muharre RJ. Perfil dos pacientes portadores de cancer colorretal operados em um hospital geral: necessitamos de um programa de rastreamento acessível e efetivo. *Rev Bras Coloproct* 2010; 30(2):160-6.
15. Bozzetti F. Nutritional status, cachexia and survival in patients with advanced colorectal carcinoma. Different assessment criteria for nutritional status provide unequal results. *Clin Nutr* 2013; 32(5):876.
16. Zandona B, Carvalho LP, Schimmedt J, Koppe DC, Koshimizu RT, Mallmann AM. Prevalencia de adenomas colorretais em pacientes com historia familiar para cancer colorretal. *Rev bras Coloproct* 2011; 31(2):145-9.
17. Arafa MA, Waly M, Jriesat S, Khafajei A, Sallam S. Dietary and lifestyle characteristics of colorectal cancer in Jordan: a case control study. *Asian Pacific J Cancer Prev* 2011; 12:1931-6.
18. Casimiro C. Factores etiopatogenicos en el cancer colorrectal. Aspectos nutricionales y de estilo de vida (segunda de dos partes). *Nutr Hosp* 2002; XVII (3): 128-38.
19. Aguilar-Nascimento JE, Caporossi C, Bicudo AS. Abordagem multimodal em cirurgia colorretal sem preparo mecanico de colon. *Rev Col Bras Cir* 2009; 36(3):204-9.
20. Elahi MM, McMillan DC, McArdle CS, Angerson WJ, Sattar N. Score based on hypoalbuminemia and elevated C-reactive protein predicts survival in patients with advanced gastrointestinal cancer. *Nutr Cancer* 2004; 48:171-3.
21. Ishizuka M, Nagata H, Takagi K, Horie T, Kubota K. Inflammation-based prognostic score is a novel predictor of postoperative outcome in patients with colorectal cancer. *Ann Surg* 2007; 246:1047-51.
22. Lohsiriwat V, Lohsiriwat D, Boonnuch W, Chinswangwatanakul V, Akaraviputh T, Lertkayamanee N. Pre-operative hypoalbuminemia is a major risk factor for postoperative complications following rectal cancer surgery. *World J Gastroenterol* 2008; 14:1248-51.
23. Sun LC, Chu KS, Cheng SC, Lu CY, Kuo CH, Hsieh JS, et al. Preoperative serum carcinoembryonic antigen, albumin and age are supplementary to UICC staging systems in predicting survival for colorectal cancer patients undergoing surgical treatment. *BMC Cancer* 2009; 9:288.
24. Lai CC, You JF, Yeh CY, Chen JS, Tang R, Wang JY, et al. Low preoperative serum albumin in colon cancer: a risk factor for poor outcome. *Int J Colorectal Dis* 2011; 26:473-81.
25. Smith RK, Broach RB, Hedrick TL, Mahmoud NN, Paulson EC. Impact of BMI on postoperative outcomes in patients undergoing proctectomy for rectal cancer: a national surgical quality improvement program analysis. *Dis Colon Rectum* 2014; 57:687-93.