

assessment of Morphological Prognostic Factor in Colorectal Cancer and Survival Analysis

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Abstract

Background: To assess morphological prognostic factor in colorectal cancer and survival analysis. **Materials and Methods:** Eighty- six resected specimens of CRC received in the department of general pathology were selected for the study. Parameters such as different histology subtype, common presenting symptoms, site, size, vascular and perineural invasion, stage, and survival analysis was done. **Result:** Age group <40 years comprised of 42, 40-60 years 5 and >60 years 39 cases. Subtypes were mucinous carcinoma in 4, signet ring cell carcinoma in 4, Adenocarcinoma NOS in 64, neuroendocrine carcinoma in 2 and Adenocarcinoma+ Mucin secretion in 12 cases. The difference was significant ($P < 0.05$). Symptoms were bleeding per rectum (PR) in 52, altered bowel habit in 34, abdominal pain in 46, mass in the abdomen in 13, fatigue in 10 and weakness in 7 cases. Site was rectum in 50 and left colon in 36. Size was <5 cm in 25 and gross configuration in 61. Invasion was vascular in 3 and perineural in 1. Disease free survival (%) on 12 months was 98%, 24 months was 93%, 36 months was 89%, 48 months was 85% and on 60 months was 83%. The difference was observed ($P < 0.05$). **Conclusion:** Common symptoms observed were bleeding per rectum, altered bowel habit, abdominal pain, mass in the abdomen, fatigue and weakness. There was high disease-free survival rate observed. Common symptoms observed were bleeding per rectum, altered bowel habit, abdominal pain, mass in the abdomen, fatigue and weakness. There was high disease-free survival rate observed. Most important prognostic factors found were site, size and perineural invasion.

INTRODUCTION

The global burden of colorectal cancer (CRC) has been rising rapidly with population growth, changes in demographics and Westernization of lifestyle habits. It was estimated to have 18.1 million new cancer cases, and 9.6 million deaths caused by cancer in year 2018.^[1] CRC is the third commonest diagnosed cancer and the second leading cause of cancer-related mortality. Many Asian countries including Japan and Singapore have experienced 2–4 times increase in incidence of CRC during the past few decades.^[2] This could be attributed to changes in dietary habits and lifestyle. World Cancer Research Fund (WCRF) report (2007), obesity, lack of exercise, and high meat consumption were considered as convincing environmental factors to affect CRC risk.^[3] Until now, standardized pathological staging systems consider only parameters regarding mural depth and lymph node involvement to predict the likelihood of long-term survival.^[4]

Factors such as serosal penetration, resected margin assessment, tumor grade, histological type, venous invasion, perineural invasion, tumor budding, host-immune response, molecular markers, and so on may reflect the biological behavior of individual cancer tissue and may correlate with tumor aggressiveness and risk of recurrence.^[5] Considering this, we planned present study to assess morphological prognostic factors in colorectal cancer and survival analysis.

MATERIALS AND METHODS

Eighty- six resected specimens of CRC received in the department of general pathology were selected for the study. The institutional ethical approval was obtained before starting the study. Parameters such as different histology subtype, common presenting symptoms, site, size, vascular and perineural invasion, stage, and survival analysis was done. The tumors were categorized into well differentiated (>95% gland formation), moderately

differentiated (50%–95% gland formation), and poorly differentiated (<50% gland formation). Results of the study were compiled and subjected to statistical analysis using Mann Whitney U test. The level of significance was set below 0.05.

RESULTS

Age group <40 years comprised of 42, 40-60 years 5 and >60 years 39 cases [Table 1].

Subtypes were mucinous carcinoma in 4, signet ring cell carcinoma in 4, Adenocarcinoma NOS in 64, neuroendocrine carcinoma in 2 and Adenocarcinoma+ Mucin secretion in 12 cases. The difference was significant (P< 0.05) [Table 2].

Symptoms were bleeding per rectum (PR) in 52, altered bowel habit in 34, abdominal pain in 46, mass in the abdomen in 13, fatigue in 10 and weakness in 7 cases. Site was rectum in 50 and left

colon in 36. Size was <5 cm in 25 and gross configuration in 61. Invasion was vascular in 3 and perineural in 1. Disease-free survival (%) on 12 months was 98%, 24 months was 93%, 36 months was 89%, 48 months was 85% and on 60 months was 83%. The difference was observed (P< 0.05) [Table 3].

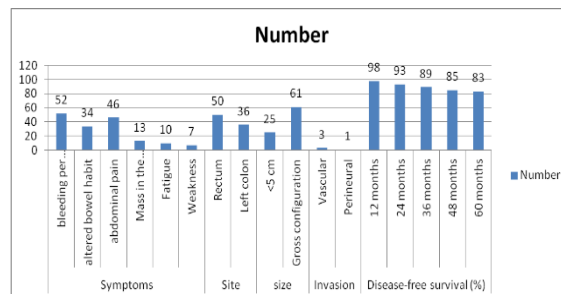


Figure 1: Assessment of parameters

Table 1: Distribution of specimens

Age group (years)	Number	P value
<40 years	42	0.17
40-60 years	5	
>60 years	39	

Table 2: Different histology subtype

Subtype	Number	P value
Mucinous carcinoma	4	0.01
Signet ring cell carcinoma	4	
Adenocarcinoma NOS	64	
Neuroendocrine carcinoma	2	
Adenocarcinoma+ Mucin secretion	12	

Table 3: Assessment of parameters

Parameters	Variables	Number	P value
Symptoms	bleeding per rectum (PR)	52	0.82
	altered bowel habit	34	
	abdominal pain	46	
	Mass in the abdomen	13	
	Fatigue	10	
	Weakness	7	
Site	Rectum	50	0.04
	Left colon	36	
size	<5 cm	25	0.01
	Gross configuration	61	
Invasion	Vascular	3	0.04
	Perineural	1	
Disease-free survival (%)	12 months	98	0.21
	24 months	93	
	36 months	89	
	48 months	85	
	60 months	83	

DISCUSSION

Advances in the management of colon cancer over the past decades have resulted in an improvement of the prognosis of the disease.^[6] The proportion of stage I and II has increased from 39.6% to 56.6% leading to a raise of five year relative survival from 33% in 1970s to 55.3% in 1990s.^[7] The five-year survival rate of colon cancer has not improved dramatically in the last decade, remaining at approximately 60%, and colon cancer is still one of

the leading causes of mortality in the Western countries.^[8] Despite curative resection, many patients develop recurrence at the primary site or distant organs. These high risk patients could be candidates for more aggressive treatments (neoadjuvant chemotherapy) in order to improve the prognosis.^[9] This target requires not only the development of new therapeutic modalities but also a reliable preoperative stratification of high and low risk patients.^[10,11] We planned present study to

assess morphological prognostic factors in colorectal cancer and survival analysis.

Our results showed that age group <40 years comprised of 42, 40-60 years 5 and >60 years 39 cases. Poornakala et al,^[12] evaluated various morphological prognostic factors of colorectal cancer, the correlation of the prognostic factors with survival, and the prognostic factors with independent prognostic significance. Five hundred and eighty-seven resected specimens of CRC were studied for various morphological prognostic factors. CRC incidence was higher in the age group 40–60 years and males were dominant. Rectum was the common site with bleeding per rectum as a common symptom. Predominant tumors had ulcerative gross configuration, size ≤ 5 cm and were free of transverse, radial margin involvement. Majority of tumors were well-differentiated adenocarcinoma with invasion beyond muscularis propria, without vascular, perineural invasion, and lymph node involvement and were in Stage II. The overall and disease-free 3-year survival rates were 89.1% and 88%, respectively. Among the eight significant factors in univariate analysis, tumor histology, depth of invasion, and perineural invasion were found to have independent prognostic significance in multivariate analysis.

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Symptoms were bleeding per rectum (PR) in 52, altered bowel habit in 34, abdominal pain in 46, mass in the abdomen in 13, fatigue in 10 and weakness in 7 cases. Site was rectum in 50 and left colon in 36. Size was <5 cm in 25 and gross configuration in 61. Invasion was vascular in 3 and perineural in 1. Disease-free survival (%) on 12 months was 98%, 24 months was 93%, 36 months was 89%, 48 months was 85% and on 60 months was 83%. Grande et al,^[13] in their study ninety-two patients with colon cancer, who underwent surgical resection were analyzed. On survival analysis we found that depth of tumour invasion ($P < 0.001$; F-ratio 2.11), type of operation ($P < 0.001$; F-ratio 3.51) and CT scanning ($P < 0.001$; F-ratio 5.21) were predictors of survival. Considering the degree of mural invasion as independent variable, on univariate analysis, we observed that mucorrhea, anismus, hematocrit, WBC count, fibrinogen value and CT scanning were significantly related to the degree of mural invasion of the cancer. On the multivariate analysis, fibrinogen value was the most statistically significant variable ($P < 0.001$) with the highest F-ratio (F ratio 5.86). Finally, in the present study, the tumour site was significantly related neither to the survival nor to the mural invasion of the tumour.

Shahid et al,^[14] in their study a total of 869 patients were diagnosed. Out of 869, 454 (52.24 %) were male and the rest were from the female group. Mostly the patients were from the 57 to 75 years of age group with a median age of 64 years. A total of 63.75 % of patients was diagnosed with colon cancer and one-third of them belong to stage III with a high percentage of adenocarcinoma (91.71 %).

CONCLUSION

Common symptoms observed were bleeding per rectum, altered bowel habit, abdominal pain, mass in the abdomen, fatigue and weakness. There was high disease-free survival rate observed. Most important prognostic factors found were site, size and perineural invasion.

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