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Research paper

Does aging influence clinical presentation and pathological staging in colorectal cancer?

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ABSTRACT

Objective: To evaluate the influence of age on clinical presentation and pathological staging in colorectal cancer.
Design: Retrospective chart review.
Setting: University hospital.
Methods: The medical records of 216 patients aged ≥ 50 years with colorectal cancer treated between 2006 and 2012 were reviewed. Patients were stratified by age into two groups: 50–64 years and ≥ 65 years. Clinical presentation and pathological staging were compared between the two groups.
Results: The older group comprised 116 patients with a mean age of 71.13 ± 4.72 years, and the younger group, 100 patients with a mean age of 56.97 ± 4.55. Older and younger adults had similar rates of lower gastrointestinal bleeding (72 vs. 67%, $P = 0.4389$), changes in bowel habit (72 vs. 68%, $P = 0.5375$), and weight loss (55 vs. 53%, $P = 0.6979$). Abdominal pain was less common in the older group (53 vs. 68%, $P = 0.0028$). On multivariate analysis, age did not influence the time elapsed since symptom onset, pathological stage T3/T4, or final pathological stage III/IV.
Conclusion: Older patients reported a lower frequency of abdominal pain, but time from symptom onset to diagnosis and pathological staging were similar to those of younger patients.

1. Introduction

Colorectal cancer is the third most common malignancy in men and women alike. More than 1.2 million new cases are diagnosed and 600,000 deaths occur due to colorectal cancer each year. In developed countries, the median age at diagnosis is 70 years. Although the incidence of colorectal cancer is decreasing in the U.S. population, it is rising in Asian countries and developing nations [1].

Currently, 13.3% of the U.S. population is over 65 years old; this proportion will reach 53.2% in 2020. In the United Kingdom, 1.1 million people are aged 85 and over [2].

Some studies have reported that clinical presentation and time from symptom onset to diagnosis are similar in the elderly and in younger adults. However, younger patients may have a longer symptom duration than older adults. In patients over the age of 75, abdominal pain may be more insidious in onset, and is sometimes less frequent [3].

Advancing age may interfere with diagnosis of colorectal cancer, as adults over age 80 are not screened and thus tend to be diagnosed at more advanced stages [2]. In addition to the predictive effect of age, elderly patients undergo surgery less often, are treated less and have lower rates of resection than young patients with colorectal cancer. Due to delayed diagnosis, elderly patients often present with complications requiring urgent surgery, which is reflected by a lower rate of elective surgery than in younger patients [2].

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In view of this later diagnosis and worse disease stage at diagnosis, survival is compromised in elderly patients. The 5-year survival rate is >90% with early diagnosis, versus 11.3% in advanced-stage disease [3,4].

The present study sought to assess the influence of aging on clinical presentation and pathological staging of colorectal cancer.

2. Methods

The medical records of 309 consecutive patients with a histopathological diagnosis of adenocarcinoma with a primary site in the colon or rectum, who were treated at a single institution, between January 2006 and December 2012, were reviewed. The study was approved by the Research Ethics Committee of Universidade de Brasília (UnB) Medical School, and was conducted in accordance with the provisions of the Declaration of Helsinki.

Of the 309 patients, 93 (30.1%) were excluded due to the following factors: age <50 years, operative urgency, asymptomatic disease diagnosed on screening, or synchronous cancer.

The following data were obtained from the medical records of the 216 remaining patients: epidemiological variables, demographic data, risk factors for colorectal cancer (personal history of previous cancer, family history of colon cancer, smoking, alcohol consumption, and body mass index [BMI]) and clinical symptoms (lower gastrointestinal [GI] bleeding, change in bowel habits, abdominal pain, and weight loss). Symptom duration in months from onset of first clinical manifestation to definitive diagnosis of colorectal cancer was also obtained. The histopathological findings reported by pathologists in each case were reviewed.

We used the pathological tumor-node-metastasis (pTNM) staging system to classify patients as having stage I, II, III, or IV disease. Tumors were classified by pathological T stage (pT stage), pathological N stage (pN stage), and final pathological stage (p stage I, II, III, and IV).

Tumor site was stratified into three groups: rectum, left colon (if located in the sigmoid, descending colon, or splenic flexure), and right colon (if located in the transverse colon or hepatic flexure).

The pre-treatment assessment and staging strategy included clinical evaluation, digital rectal examination, colonoscopy with biopsy, and computed tomography (CT) scans of the chest and abdomen. Patients with rectal lesions also underwent magnetic resonance imaging (MRI) of the pelvis, and in those with evidence of metastasis, the diagnosis was confirmed by CT-guided biopsy.

Symptom duration in months was calculated from the first day of symptom onset to the day of pathological diagnosis.

The study population was categorized into two groups by age at diagnosis: 50–64 years and ≥65 years. These two groups were compared in terms of clinical presentation and histopathological staging.

Quantitative variables were compared by Student's *t*-test if normally distributed in both groups or by the nonparametric Mann–Whitney *U* test otherwise. Qualitative variables were summarized as absolute and relative frequencies and compared by the Chi^2 test or Fisher's exact test.

Multivariate modeling and prevalence ratios with 95% confidence intervals were used to analyze the strength of association between each independent variable and pathological stages T3 and T4 or final pathological stages III and IV. In the model employed, variables associated with pathological stages T3 and T4 or final pathological stages III and IV with $P < 0.25$ on an initial crude analysis were included in the multivariate model with age as a covariate and then adjusted [5]. Multivariate analysis was conducted using Poisson regression with robust variance (log-linear). Poisson regression was used to provide a better estimate of prevalence ratios, which, in turn, provide a more significant representation of effect measures in cross-sectional studies. The significance level was set at $P < 0.05$.

3. Results

Between January 2006 and December 2012, 216 patients were eligible for the study. Demographic and epidemiological characteristics and frequency of symptoms in older (≥65 years) and younger (50–64 years) patients are described in Table 1. Apart from age, the epidemiological and demographic characteristics of both groups were similar. The older group (age ≥ 65 years) comprised 116 patients, with a mean age of 71.13 ± 4.72 years, whereas the younger group (50–64 years) comprised 100 patients, with a mean age of 56.97 ± 4.55 years. The gender distribution was similar in both groups ($P = 0.3446$).

Older and younger patients had similar rates of lower GI bleeding (72 vs. 67%, $P = 0.4389$), change in bowel habits (72 vs. 68%, $P = 0.5375$), and weight loss (55 vs. 53%, $P = 0.6979$). Abdominal pain was less prevalent in the older group (53 vs. 68%, $P = 0.0028$). The time elapsed between symptom onset and diagnosis was similar in the two groups: 9.3 ± 2.8 months in the older group vs. 10.5 ± 3.1 months in the younger group ($P > 0.05$). After multivariate analysis, neither age nor any of the other variables (sex, family history of cancer, personal history of cancer, alcohol intake, BMI, smoking, and clinical symptoms) were associated with symptom duration > 7 months.

The distribution of primary tumor sites was similar in the older and younger groups: rectum, 61 (56%) vs. 45 (45%) ($P = 0.1133$); left colon, 31 (29%) vs. 40 (40%) ($P = 0.0663$); right colon, 24 (22%) vs. 22 (22%) ($P = 0.9689$). Table 2 shows the distribution of pTNM stages. The frequency of final pathological stage III/IV was 54% in the older group and 55% in the younger group. (Table 2). On multivariate analysis, the crude and adjusted (for age and other

Table 1
Demographic and epidemiological characteristics and frequency of symptoms in older (≥65 years) and younger (50–64 years) patients.

Variable	≥65 years (n = 116)	50–64 years (n = 100)	P
Sex			0.3446
Male	54 (47)	53 (53)	
Female	62 (53)	47 (47)	
BMI (kg/m²)[a]	21.9 ± 7.1	23.42 ± 6.02	0.7881
Personal history of cancer			0.9915
No	109 (94)	94 (94)	
Yes	7 (6)	6 (6)	
Family history of colon cancer			0.8210
No	99 (86)	85 (85)	
Yes	17 (14)	15 (15)	
Smoking			0.7661
No	76 (65)	68 (68)	
Yes	40 (35)	32 (32)	
Alcohol consumption			0.2476
No	81 (70)	63 (63)	
Yes	35 (30)	37 (37)	
Bleeding			0.4389
No	33 (28)	33 (33)	
Yes	83 (72)	66 (67)	
Change in bowel habits			0.5375
No	33 (28)	32 (32)	
Yes	83 (72)	67 (68)	
Abdominal pain			0.0028
No	61 (53)	32 (32)	
Yes	55 (47)	67 (68)	
Weight loss			0.6979
No	52 (45)	47 (47)	
Yes	64 (55)	52 (53)	

All variables expressed as n (%) unless otherwise noted.
[a] Mean ± standard deviation.