

Colorectal cancer in an Eastern Caribbean nation: are we missing an opportunity for secondary prevention?

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ABSTRACT

Objective. To establish whether there was any difference in disease stage in patients with screening-detected colorectal cancer (CRC) in a Caribbean country.

Methods. The mode of presentation (elective vs. emergent), method of diagnosis (screening vs. symptomatic), and disease stage were retrospectively compared in all consecutive patients who had resections for CRC over a five-year period. Early CRC was defined as disease that could be completely resected with no involvement of adjacent organs, lymph nodes, or distant sites. Locally advanced CRC was disease that involved contiguous organs without distant metastases that was still amenable to curative resection.

Results. There were 97 patients at a mean age of 64.9 ± 12.2 years treated for CRC, and only 21 (21.6%) had their diagnoses made through screening. Significantly more screening-detected lesions were early-stage CRCs (21.7% vs. 9.3%; $p < 0.001$). At the time of diagnosis, patients who did not have screening-detected lesions had a greater proportion of locally advanced (42.3% vs. 0) and metastatic (26.8% vs. 0) CRC. Those who did not have screening-detected lesions had a greater incidence of emergency presentations at diagnosis (26.8% vs. 0).

Conclusions. The incidence of screening-detected CRC in this Caribbean nation was low. Consequently, most patients presented with locally advanced or metastatic CRC, for which there is less opportunity to achieve a cure. Significantly more screening-detected lesions were early-stage CRCs. It is time for policymakers to develop a national CRC screening program.

Keywords

Colorectal neoplasms; Barbados; Caribbean region.

Barbados is a Small Island Developing State in the Eastern Caribbean with a population of 287 371 inhabitants (1). Barbados has one of the highest age-standardized colorectal cancer (CRC) incidence rates in the world (2). Recent Globocan data published by the International Agency for Research on Cancer/World Health Organization identified CRC as the second commonest cause of cancer-related mortality on the island (1).

The principle of secondary prevention is to identify a disease before symptoms appear, when patients can be treated with curative intent. With such a high burden of CRC in Barbados (1, 2), secondary prevention should be a priority for this nation.

Nevertheless, up to the year 2021, there were no national screening programs in Barbados.

We carried out this study in an attempt to increase awareness of CRC screening. The aim was to determine the proportion of patients with CRC diagnoses who were detected through screening and to determine whether there was any difference in disease stage at diagnosis.

MATERIALS AND METHODS

The Government of Barbados provides free health care to all legal residents through a government-administered taxation

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scheme. In this subsidized health care system, there is no national screening program for CRC. Persons are generally sent for fecal occult blood testing and/or colonoscopy when they develop gastrointestinal symptoms and occasionally when health care providers recommend ad hoc (opportunistic) screening for high-risk persons. Patients diagnosed with CRC are referred to the Queen Elizabeth Hospital, the island’s sole government-subsidized tertiary referral center, for colectomy and adjuvant systemic therapy.

Ethical approval was secured from the institutional review board to retrospectively audit records of patients who had resections for CRC between 1 January 2014 and 1 January 2019. The patient records were retrieved and the following data were extracted: patient demographics, mode of presentation (elective vs. emergent), method of diagnosis (screening vs. symptomatic), and American Joint Committee on Cancer (AJCC) stage.

Early CRC was defined as disease that could be completely resected with no involvement of adjacent organs, lymph nodes, or distant sites (AJCC stages 0, I, and IIa). Locally advanced CRC was defined as disease that involved contiguous organs and without distant metastases, that was still amenable to curative resection (AJCC stage IIb, IIc, and III). Metastatic disease indicated the presence of distant spread.

Disease stage was compared based on mode of presentation and method of diagnosis. Descriptive statistical analysis was generated using SPSS version 21.0. A descriptive analysis for the data set was performed using the Chi square test of independence to investigate correlations. A *p*-value of 0.05 was considered significant.

RESULTS

There were 97 patients with a mean age of 64.9 years (standard deviation [SD] 12.2) treated for CRC over the study period. There was a higher proportion of males (1.3:1), with 54 males at a mean age of 64.5 years (median 64; mode 64; SD 11.3) and 43 females at a mean age of 65.4 years (median 63; mode 58; SD 13.5).

There were 21 (21.6%) patients who had diagnoses made through screening and 76 (78.4%) who had investigations after developing symptoms. Significantly more screening-detected lesions were early-stage CRCs (21.7% vs. 9.3%; *p* < 0.001). Table 1 compares the AJCC stages in both patient groups.

We evaluated all patients according to their mode of presentation. There were 26 (26.8%) patients who had CRC diagnoses made after presenting as an emergency with malignant bowel obstruction (19), perforation (5), or bleeding (2). At the time of diagnosis, patients who did not have screening-detected lesions had a greater proportion of locally advanced (42.3% vs. 0) and metastatic (26.8% vs. 0) CRC. In the 71 patients who had diagnoses made on an elective basis, 25 (35.2%) still had early CRC at the time of presentation. Table 2 compares AJCC stage at the time of diagnosis. We did not find any statistically significant difference in disease stage depending on mode of presentation.

DISCUSSION

One of the main principles behind CRC treatment is secondary prevention: to address the disease when there is still an opportunity to achieve complete resection and potential cure.

TABLE 1. Comparison of colorectal cancer disease stage analyzed by the method of detection

AJCC stage	All patients (n = 97)	Screening-detected (n = 21)	Non-screening (n = 76)
Early CRC	30 (30.9%)	21 (21.7%)	9 (9.3%)
• 0		1	0
• I		5	2
• IIa		2	7
Locally advanced	41 (42.3%)	0	41 (42.3%)
• IIb		0	1
• IIc		0	3
• IIIa		0	4
• IIIb		0	27
• IIIc		0	6
Metastatic	26 (26.8%)	0	26 (26.8%)
• IVa		0	17
• IVb		0	4
• IVc		0	5

Note: AJCC, American Joint Committee on Cancer; CRC, colorectal cancer.
Source: Prepared by the authors based on data collected from the Queen Elizabeth Hospital, Barbados, from 1 January 2014 to 1 January 2019.

Therefore, most authorities recommend screening for CRC (3–5).

Although CRC screening is recommended, most Caribbean countries, including Barbados, have not instituted comprehensive CRC screening programs. Most practice opportunistic screening, where selected individuals are subjected to ad hoc screening depending on recommendations from their physicians. This is largely due to a lack of prioritization by policymakers.

Every year in Barbados, 14.8 individuals per 100 000 population are diagnosed with CRC (1). In fact, the World Cancer Research Fund/American Institute for Cancer Research ranked Barbados as having the highest incidence of CRC across the Caribbean (2) and the eighth highest age-standardized rate of CRC in the world (2). It would stand to reason that a national screening program should be prioritized in this high-risk population. However, we have shown that a small proportion of persons with CRC have their diagnoses made through screening. More importantly, screening allowed significantly more patients to have diagnoses made at an early disease stage (21.7% vs. 9.3%). It stands to reason, therefore, that a properly organized national screening program would detect a larger proportion of patients with early CRC. By extension, a larger number of patients would be candidates for R0 resection and potential cure.

Apart from a greater potential for curative R0 resection, patients with early CRC are more likely to have their colectomy performed through the laparoscopic approach compared to those with locally advanced disease (6). Well-designed studies have proved the advantages of the laparoscopic approach to colectomy in international (7) and Caribbean literature (8).

In this study population, 69.1% of persons already had locally advanced or metastatic CRC at the time of diagnosis. Existing data show that there are worse clinical outcomes in persons with advanced stages of CRC (6, 7). The five-year survival rate after treatment falls from approximately 70% for patients with early CRC to 30% for those with locally advanced disease (6)

TABLE 2. Comparison of colorectal cancer stage according to the mode of clinical presentation

AJCC stage	All (n = 97)	Elective (n = 71)	Emergency (n = 26)	P-value
Early CRC	30	25 (35.2%)	5 (19.2%)	0.207
• 0		1	0	
• I		9	1	
• IIa		15	4	
Locally advanced	41	27 (38.0%)	14 (53.9%)	0.244
• IIb		0	1	
• IIc		1	2	
• IIIa		4	0	
• IIIb		19	8	
• IIIc		3	3	
Metastatic	26	19 (26.8%)	7 (26.9%)	0.808
• IVa		14	3	
• IVb		3	1	
• IVc		2	3	

Note: AJCC, American Joint Committee on Cancer; CRC, colorectal cancer.
Source: Prepared by the authors based on data collected from the Queen Elizabeth Hospital, Barbados, from 1 January 2014 to 1 January 2019.

and only 5%–10% for those with metastatic disease (9). Also, patients undergoing surgery for locally advanced CRC have greater postoperative morbidity and mortality (10) than those with early CRC. This provides further impetus to implement CRC in this nation.

Globally, the treatment of patients with CRC is a significant economic burden, with estimates from the United States of America in the year 2000 in the range of US\$ 5–6 billion per annum (11). Of this, 80% of the expenditure was related to inpatient costs (11), often as a result of complicated CRC. While there is little economic data from the English-speaking Caribbean, Torres et al. (12) reported a significant rise in CRC-related expenditure in Brazil, from US\$ 1.65 million in 1996 to US\$ 33.5 million in 2008, mirroring the rise in emergency admissions. We expect a similar trend in the Caribbean, as we have demonstrated that 27% of patients have their diagnosis made on emergency presentation to hospital in Barbados. Assuming that screening programs would reduce the number of emergency presentations, it stands to reason that this would also bring a reduction in expenditure related to treatment of these emergencies.

In our study, 26.8% of patients presented as emergent cases of CRC with complications. There are existing data to show that patients have a worse clinical outcome and lower five-year survival when they develop malignant bowel obstruction and

perforation (13). Although the proportion of early CRC in our study was lower in patients who presented as emergent cases (19.2% vs. 35.2%), we did not find a statistical association. Nevertheless, we suggest that it is still clinically important to aim for a reduction in emergency presentations, because these patients have less opportunity for laparoscopic colectomies (6, 14), fewer curative R0 resections (14), greater post-operative morbidity rates (10, 14), and higher perioperative mortality (10) compared with patients who have their diagnoses made on an elective basis.

These are important data that could shape public health policies and guide screening protocols in Barbados. Ultimately, these tailored policies would increase early diagnosis and improve therapeutic outcomes in this population.

Limitations

One limitation of this study was that the study methodology only allowed collection of data from patients undergoing surgery for CRC. Data for patients with early CRC treated endoscopically and those with stage IV CRC who were not amenable to surgical treatment would not be included in the data collection.

Conclusion

The incidence of screening-detected CRC in this Caribbean nation was low. Consequently, most patients present with locally advanced (42.3%) or metastatic (26.8%) CRC, for which there is less opportunity to achieve a cure. The evidence presented here supports screening by showing that significantly more screening-detected lesions were early-stage CRCs (21.7% vs. 9.3%; $p < 0.001$). It is time for policymakers to develop and institute a national screening program for CRC.

Author contributions. SG, SOC, and SM conceived the original idea and planned the data collection. SG, SOC, GP, and SR collected and analyzed the data. SG, EP, GP, and SOC performed the analysis and interpreted the findings. SG and SOC wrote the paper. All authors reviewed and approved the final version.

Conflict of interest. None declared.

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El cáncer colorrectal en un país del Caribe oriental: ¿estamos desaprovechando una oportunidad de prevención secundaria?

RESUMEN

Objetivo. Determinar las diferencias en el estadio de la enfermedad en pacientes con cáncer colorrectal diagnosticado mediante un programa de detección sistemática en un país del Caribe.

Métodos. Se realizó una comparación en retrospectiva de la modalidad de presentación (programada o de urgencia), el método de diagnóstico (por detección sistemática o por síntomas) y el estadio de la enfermedad en todos los pacientes consecutivos con resecciones por cáncer colorrectal en un período de cinco años. Se definió el cáncer colorrectal en fase inicial o incipiente como una enfermedad que puede extirparse completamente sin la afectación de los órganos adyacentes, los ganglios linfáticos o focos distantes. Se consideró el cáncer colorrectal localmente avanzado como una enfermedad que afecta a los órganos contiguos sin metástasis a distancia y aún susceptible de resección curativa.

Resultados. Hubo 97 pacientes de una media de edad de $64,9 \pm 12,2$ años en tratamiento por cáncer colorrectal y únicamente 21 (21,6%) habían recibido un diagnóstico mediante un programa de detección sistemática. Un número significativamente mayor de los diagnósticos dados por detección sistemática se trató de cáncer colorrectal de fase inicial (21,7 % frente a 9,3 %; $p < 0,001$). En el momento del diagnóstico, se registró una mayor proporción de cáncer colorrectal localmente avanzado (42,3 % frente a 0) y metastásico (26,8 % frente a 0) en los pacientes sin lesiones diagnosticadas en un programa de detección sistemática. Los pacientes cuyas lesiones no fueron diagnosticadas mediante la detección sistemática registraron una mayor incidencia de presentaciones de urgencia en el momento del diagnóstico (26,8 % frente a 0).

Conclusiones. La incidencia de cáncer colorrectal diagnosticado mediante detección sistemática en este país del Caribe fue baja. En consecuencia, la mayoría de los pacientes presentó cáncer colorrectal localmente avanzado o metastásico, cuya oportunidad de cura es menor. Un número significativamente mayor de lesiones diagnosticadas mediante detección sistemática se trató de cáncer colorrectal de fase inicial. Ha llegado el momento de que las personas responsables de las políticas elaboren un programa nacional de detección sistemática de cáncer colorrectal.

Palabras clave Neoplasias colorrectales; Barbados; región del Caribe.

Câncer colorretal em um país do Caribe Oriental: estamos deixando passar a oportunidade de realizar a prevenção secundária?

RESUMO

Objetivo. Determinar se houve diferença no estágio da doença detectada no exame de prevenção de câncer colorretal em um país do Caribe.

Métodos. Fatores como tipo de apresentação (eletiva vs. de emergência), método de diagnóstico (prevenção vs. detecção sintomática) e estágio da doença foram comparados retrospectivamente em todos os pacientes consecutivos submetidos a cirurgia de ressecção de câncer colorretal em um período de cinco anos. Definiu-se doença em estágio inicial como o tumor passível de ressecção total sem o envolvimento de órgãos adjacentes, gânglios linfáticos ou sítios a distância, e doença localmente avançada como o tumor envolvendo órgãos contíguos, sem metástase a distância, mas passível de ressecção curativa.

Resultados. Noventa e sete pacientes com média de idade de $64,9 \pm 12,2$ anos foram tratados devido ao câncer colorretal e apenas 21 (21,6%) tiveram a doença diagnosticada no exame de prevenção. Um percentual significativamente maior de lesões detectadas no exame de prevenção estava em estágio inicial (21,7% vs. 9,3%; $p < 0.001$). No momento do diagnóstico, os pacientes cujas lesões de câncer colorretal não foram detectadas com o exame de prevenção apresentaram um maior percentual de doença localmente avançada (42,3% vs. 0) ou metastática (26,8% vs. 0). Houve também, entre esses pacientes, uma maior incidência de apresentação em caráter de emergência (26,8% vs. 0).

Conclusões. Observou-se uma baixa incidência de câncer colorretal na população deste país do Caribe. Porém, a maioria dos pacientes apresentou doença localmente avançada ou metastática no diagnóstico – uma situação associada a uma menor chance de cura. O percentual de lesões detectadas em estágio inicial com o exame de prevenção foi significativamente maior. As autoridades de saúde devem aproveitar a oportunidade e instituir um programa nacional de prevenção do câncer colorretal.

Palavras-chave Neoplasias colorretais; Barbados; região do Caribe.
