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Patient Knowledge Regarding Colorectal Cancer Risk, Opinion of Screening, and Preferences for a Screening Test

Courtney C. Moreno, MD[a,*], Thomas Jarrett, MD[b], Brianna L. Vey, BS[c], Pardeep K. Mittal, MD[a], Elizabeth A. Krupinski, PhD[a], David L. Roberts, MD[b]

[a] Department of Radiology and Imaging Sciences, Emory University School of Medicine, Atlanta, GA
[b] Department of Medicine, Emory University School of Medicine, Atlanta, GA
[c] Emory University School of Medicine, Atlanta, GA

Aims: To assess patient knowledge about colorectal cancer incidence and prognosis as well as willingness to undergo screening with various tests (eg, optical colonoscopy, stool-based tests, computed tomographic colonography (CTC)).
Materials and Methods: A survey was administered to consecutive patients of a general academic-based internal medicine clinic.
Results: Survey response rate was 86.3%. A majority of respondents (55%) reported being aware of general information about colorectal cancer, and 99% indicated a belief that colorectal cancer screening was a good idea. A majority of respondents (73%) were willing to undergo optical colonoscopy, and some were willing to undergo stool-based tests (48%), or CT colonography CTC (40%). A majority reported being more willing to undergo a colorectal cancer screening test if the test did not involve radiation (86%), did not involve insertion of a tube or device into the rectum (78%), did not involve a pre−proceduralpreprocedural bowel cleansing regimen (73%), or did not involve sedation (60%).
Conclusion: Improved patient education about the negligible radiation risk associated with CTC or development of a non−invasive imaging test that did not involve a preprocedural bowel cleansing regimen may increase rates of colorectal cancer screening.

Introduction

Colorectal cancer is the second leading cause of cancer-related death in the United States and will result in an estimated 50,000 deaths in 2017.[1] Colorectal cancer screening can prevent cancer and improve outcomes by detecting precancerous polyps and by identifying earlier stage, more treatable disease. Large randomized clinical trials have shown decreased colorectal cancer specific mortality with screening.[2] It has been estimated that between 236,000 and 550,000 colorectal cancers were prevented by screening during the past 3 decades in the United States with an overall decrease in colorectal cancer incidence and a shift from late to early stage cancers being detected.[3]

Various societies including the American Cancer Society and the United States Preventative Services Task Force (USPSTF) have published recommendations for colorectal cancer screening. These recommendations are generally presented as lists of options including structural examinations of the colon (eg, optical colonoscopy and computed tomographic colonography [CTC]) and stool-based tests (eg, fecal occult blood tests [FOBT] and fecal DNA tests).[4] Average risk individuals are advised to undergo screening between the ages of 50 and 75.[4]

However, rates of colorectal cancer screening in the United States are suboptimal, with only 62.4% of respondents aged 50-75 reporting having undergone a recent colorectal cancer screening test (eg, FOBT within the past year, FOBT within the past 3 years and flexible sigmoidoscopy within the past 5 years, optical colonoscopy within the past 10 years) in the most recently reported National Health Interview Survey.[5] Screening rates for colorectal cancer were less than those for breast cancer (71.5%) and cervical cancer (83.0%) in this same survey.[5]

The purpose of this investigation was to assess patients' knowledge regarding colon cancer incidence and prognosis, opinions regarding screening, and preferences for a screening test, and to assess for differences based on sex, age, race, and ethnicity.

Materials and Methods

This study was reviewed by our university's Institutional Review Board (IRB) and was deemed IRB exempt as no identifiable patient information was collected. The survey included questions designed to assess respondents' knowledge about colorectal cancer incidence and prognosis. Surveys were distributed to consecutive patients of an academic-based general internal medicine clinic at time of appointment check-in at the Seavey Clinic (Emory Healthcare, Atlanta, GA). Patients completed the survey while in the clinic waiting room and were instructed to return the survey to either the clinic front desk staff or to their examination room nurse. The Seavey Clinic is a general internal medicine clinic within the Emory Healthcare system. The clinic serves adult patients and is staffed by 6 board certified internists and 1 nurse practitioner. In 2016, the clinic had 13,592 patient visits and sees patients for routine preventative care visits, episodic visits, as well as visits for long-term care of chronic diseases.

*Reprint requests: Courtney C. Moreno, MD, Department of Radiology and Imaging Sciences, Emory University School of Medicine, 1364 Clifton Rd, Atlanta, GA 30322.
E-mail address: courtney.moreno@emoryhealthcare.org (C.C. Moreno).

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The primary patient catchment area is metropolitan Atlanta. Fifty-nine percent of patients have commercial insurance as their primary payer, 38% Medicare, and 3% are self-pay or have Medicaid, or other insurance.

Respondents were first presented with the sentences: "Typical adults have a 5% chance of getting colon cancer in their lifetime." "Finding colon cancer early gives a 90% chance of survival." "If it is detected too late one's survival chances drop to under 15%." They were then asked to indicate if they knew these facts about colorectal cancer before participating in the survey. Respondents were also asked whether or not they thought colorectal cancer screening was a good idea.

Respondents were then presented with a table outlining advantages and disadvantages of colorectal cancer screening tests (optical colonoscopy, stool-based tests, and CTC) and were asked which screening test(s) they would be willing to undergo (Table 1). Subjects were then asked to indicate whether particular test features (no prep, noninvasive, no sedation, and no radiation) would make them more or less likely to undergo a screening test.

The data were analyzed with chi-square tests using StatView (SAS, Cary, NC). Responses were analyzed as a function of age, sex, race, and ethnicity.

Results

Two hundred and forty-nine surveys were distributed, and 239 surveys were returned of which 24 were returned blank (response rate 86.3% [215/249]). Respondent demographics are reported in Table 2.

A majority of respondents (55%) reported being aware of general information about colorectal cancer incidence and survival rates. There was a significant difference as a function of age with those $<$ 50 years more likely to respond "no" (72%) as compared to those in older groups (50-59 = 42%; 60-60 = 40%; 70-75 = 43%; $>$76 = 31%; P = 0.006). There was no significant difference as a function of sex, race, or ethnicity. Ninety-nine percent of respondents indicated that they believed colorectal cancer screening was a good idea. There was no significant difference as a function of age, sex, race, or ethnicity.

The percentage of respondents willing to undergo each type of colorectal cancer screening test is reported in the Figure. A majority (73%) of respondents were willing to undergo colonoscopy, but fewer were willing to undergo stool-based tests (48%) or CTC (40%). No difference was found based on sex, race, or ethnicity.

Of respondents aged 50-75 years (ages for whom screening is recommended by the USPSTF), 80.6% (112/139) were willing to undergo colonoscopy and 19.4% (27/139) were unwilling. Of those respondents of screening age *un*willing to undergo colonoscopy, 44.4% (12/27) were willing to undergo stool-based tests, and 22.2% (6/27) were willing to undergo CTC. Of screening age respondents, 7.2% (10/139) reported being unwilling to undergo any of the presented screening tests.

TABLE 2
Respondent demographics

Demographic variables	Percentage
Sex (209 respondents)	
Female	54.5
Male	45.5
Race (210 respondents)	
African-American	13.8
White	80.5
Other	5.7
Ethnicity (195 respondents)	
Hispanic	3.6
Age (211 respondents)	
$<$ 50	17.1
50-75	65.9
$\geq$76	17.1

In terms of willingness to undergo colonoscopy, there was a significant difference as a function of age, with those 50-59 (92%) and 60-69 (82%) more willing than those $<$ 50 (69%), 70-75 (68%), and $>$ 75 (56%) (P = 0.004). No significant differences were found based on age for willingness to undergo stool-based tests or CTC.

A majority (86%) of respondents reported that they would be more likely to undergo a colorectal cancer screening test if the test did not involve radiation. Respondents also reported that they would be more likely to undergo a colorectal cancer screening test if the test did not involve insertion of a tube or camera into the rectum (78%) or if the test did not involve a preprocedural bowel cleansing regimen (73%). A majority (60%) reported being more likely to undergo a colorectal cancer screening test if the test did not involve sedation. No significant difference was found based on sex, age, race, or ethnicity.

Discussion

Although colorectal cancer is largely a preventable disease, approximately 50,000 Americans die due to colorectal cancer annually with a projected treatment costs of $17.4 billion in the United States in 2020.[6] Less than two-thirds of Americans report being up to date with colorectal cancer screening.[5] Our survey results indicate that nearly 100% of respondents believe that colorectal cancer screening is a good idea, though 45% were unaware of basic information about colorectal cancer incidence and prognosis. These results are in line with a prior investigation which found that a majority of respondents were unaware of the recommended screening interval for optical colonoscopy.[7]

TABLE 1
Information provided to survey respondents regarding advantages and disadvantages of various screening tests

Colonoscopy		Stool-based tests		CT colonography	
Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages
• Most accurate for detection of small polyps & cancers. • Some polyps can be removed.	• Requires bowel cleansing prep. • Invasive. • Requires sedation so you need a driver. • Risk of complication (eg, 1 in 1000 risk of bowel perforation).	• Noninvasive or minimally invasive. • No risk of complication due to the test itself.	• Less accurate than colonoscopy for polyp and cancer detection. • If results are abnormal, need to undergo colonoscopy.	• Less risk of complication as compared to colonoscopy. • Does not require sedation.	• Low level radiation exposure. • Slightly less accurate than colonoscopy for small polyps. • Abnormal findings may require colonoscopy to evaluate. • Findings seen outside the colon may warrant further workup.

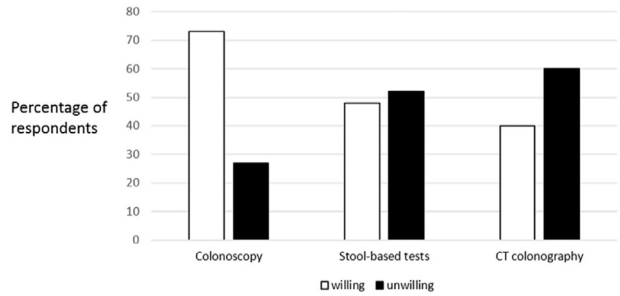

FIG. Percentage of respondents willing or unwilling to undergo colonoscopy, stool-based tests, or CT colonography.

We believe that these results indicate an opportunity to improve colorectal cancer screening rates as nearly all respondents reported believing that colorectal cancer screening is a good idea. Of possible screening tests, more respondents were willing to undergo optical colonoscopy as compared to stool-based tests or CTC. However, as a substantial numbers of patients were willing to undergo the 3 different types of tests, continuing to offer all 3 types of tests would seem to be prudent. A prior investigation of more than 10,000 screening participants found that patients offered an informed choice between different colorectal cancer screening options had higher adherence rates than participants not offered a choice.[8]

That CTC was the least popular test among our respondents may be in part related to a lack of exposure to or knowledge about CTC. CTC currently is performed infrequently at the campus at which the survey was administered. A prior investigation of patients who had previously undergone CTC and optical colonoscopy as part of the American College of Radiology Imaging Network National CTC Trial reported that 46.6% of patients preferred CTC as compared to 25.0% who preferred optical colonoscopy.[9] Other studies of individuals who have undergone both CTC and optical colonoscopy have also reported a preference for CTC.[10,11] CTC was generally considered less painful and less difficult as compared to optical colonoscopy.[10] A meta-analysis also found patient preference for CTC as compared to optical colonoscopy, with studies published in radiology journals showing a significantly stronger preference for CTC compared to studies published in gastroenterology or general medicine journals.[12] It may be that with increased exposure to CTC more patients may be willing to undergo this test. CTC is also an option for patients who have undergone an incomplete optical colonoscopy.

That a majority of respondents reported being more likely to undergo a test if the test did not involve radiation exposure suggests that practices offering CTC should consider addressing the negligible risk associated with the low level radiation exposure of CTC in patient educational materials. It has been estimated that a single screening low dose CTC study at age 60 would result in a lifetime risk of radiation-related cancer of approximately 0.05%.[13]

Approximately 7% of respondents of screening age reported being unwilling to undergo any of the presented screening tests despite reporting that colorectal cancer screening was a good idea. As a majority of respondents reported being more likely to undergo a test that did not involve radiation, insertion of a tube or device into the rectum, or a bowel preparation, there may be an opportunity to improve compliance by developing a screening test with these test features.

A limitation of this study is that it was conducted in a single institution, and results may not be generalizable to other geographic regions or patient populations. However, the results do support those found by other related studies and thus likely reflect more general perceptions and preferences. Additionally, we did not provide respondents with information regarding how the low level radiation exposure associated with CTC compares to radiation from other sources such as background radiation. It may be that if respondents had been provided such information, their willingness to undergo CTC would have been different.

In conclusion, 99% of respondents reported believing that colorectal cancer screening was a good idea though many respondents were unaware of basic information about colorectal cancer incidence and prognosis. A majority of respondents were willing to undergo at least 1 of the presented tests (eg, optical colonoscopy, stool-based tests, and CTC) with optical colonoscopy being the most popular test and CTC being the least popular. A noninvasive, radiation free test (eg, MR colonography) may increase the likelihood of individuals undergoing colorectal cancer screening.

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