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Colorectal neoplasia detection among black and Latino individuals undergoing screening colonoscopy: a prospective cohort study

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Abstract

Background—Most prospective studies of screening colonoscopy (SC) in average-risk, asymptomatic individuals have included few minority individuals. Little is known about the prevalence and distribution of adenomas found at screening colonoscopy among black and Latino individuals.

Objective—To determine the prevalence and distribution of histologically confirmed adenomas among black and Latino participants enrolled in a prospective SC study.

Design—Cross-sectional analysis of consecutive patients undergoing SC between 2008 and 2011.

Setting—Urban academic medical center.

Patients—Average risk, asymptomatic black and Latino patients aged ≥ 50 years undergoing SC.

Intervention—SC.

Main Outcome Measurements—Adenoma prevalence and distribution by ethnic group.

Results—A total of 584 patients (270 black, 314 Latino) completed SC. Overall, 26.4% had adenomas, and 20% had proximal adenomas. Advanced adenomas occurred in 11.5% (12.2% black vs 10.8% Latino; $P = .21$) and proximal advanced adenomas in 7.5% (5.9% black vs 8.9% Latino; $P = .17$). These rates were at least as high as those of other studies that enrolled mainly white participants.

Limitations—Lack of comparison group of white patients.

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Conclusion—The prevalence of adenomas, advanced adenomas, and proximal adenomas was high in both black and Latino participants. The high prevalence of clinically significant proximal lesions has implications for the choice of colon cancer screening test and colonoscopic surveillance intervals.

Colorectal cancer (CRC) is the second leading cause of cancer-related mortality in the United States, with an estimated 140,000 new cases and 50,000 deaths in 2013.[1,2] Race is associated with differences in CRC incidence and mortality. Black men and women have higher CRC incidence and mortality compared with white people, whereas these rates seem to be lower among Latino people.[2] However, compared to white people, black and Latino people are less likely to be diagnosed with early stage CRC, when treatment is more successful.[3] Disparities in CRC outcomes can be attributed at least in part to differences in access to screening and medical care.[4] In 2010, the rate of CRC screening among adults aged ≥50 years was only 47% in Latino people and 56% in black people, compared with 62% in white people.[5,6] Encouraging data during the past decade come from a concerted citywide effort to enhance screening colonoscopy (SC) rates among individuals aged ≥50 years in New York City. This program demonstrated that in only 5 years, SC rates increased overall, and ethnic disparities were eliminated.[7]

Although overall SC rates have been increasing in recent years, even at the national level,[8] little is known about the pathological findings encountered from this effort. Because the follow-up interval after colonoscopy varies based on the pathological findings, a more detailed understanding of pathology found at SC may help estimate the future healthcare burden. To date, most of our knowledge about the nature of colorectal pathology detected in prospective clinical trials of SC in average-risk individuals aged ≥50 has come from studies that mainly enrolled white participants,[9-11] or in some cases, mainly men[12] or women.[13] By contrast, most of our knowledge about the rates and types of colorectal neoplasia detected at SC among ethnic minorities has come from retrospective analyses of endoscopy or pathology data sets. Some studies suggest that black people have higher rates of adenomas and advanced adenomas than do white people.[14-16] Among Latino people, adenoma prevalence rates found at SC vary, with studies reporting lower, similar, or even higher rates compared with those of white people.[16-19] A drawback of all these studies is that most have been retrospective, and, as such, it is not always clear whether the colonoscopies were done for purely screening reasons in asymptomatic individuals. Also, several studies did not conduct histological confirmation of polyps found at SC. Finally, with greater emphasis on the quality of SC, most studies to date were unable to analyze quality indicators such as colonoscopy preparation quality or cecal intubation rates.

A decade ago, we embarked on a prospective program to reduce disparities by facilitating SC among the predominantly black and Latino minority populations served by our institution. We implemented both an open-access referral system along with patient navigation. These efforts resulted in a considerable increase in SC rates among this underserved population.[20] Encouraged by these early results, from May 2008 to December 2011, we conducted two prospective, randomized controlled trials of SC (1 funded by the National Cancer Institute and 1 internally funded) designed to test the effect of patient navigation among asymptomatic, average-risk Latino and black individuals at our urban

academic medical center. The description of the program and its overall success in terms of colonoscopy completion rates were reported recently.[21,22] Herein, we report the detailed pathological findings in this screening population. Our aim was to determine adenoma prevalence and distribution by race.

Methods

Study design

We performed a cross-sectional analysis of colonoscopic findings among consecutive patients undergoing SC as part of a prospective cohort study conducted at Mount Sinai Medical Center. Mount Sinai is a tertiary-care academic hospital in East Harlem, New York City, which also serves a large primary care population of black and Latino individuals. The prospective cohort study was an Institutional Review Board–approved patient navigation program, previously described and shown to increase SC adherence rates among urban minorities.[21,22] Patients were recruited during a visit to Mount Sinai's primary care clinics for other than acute care after their primary care physicians directly referred them for SC through our open-access endoscopy system from May 2008 to December 2011. Patients were eligible for the study if they (1) were aged ≥50 years, (2) were at average risk for CRC symptoms with no GI symptoms, (3) had no prior SC in our system in the previous 5 years, and (4) had no significant medical comorbidities requiring a before-procedure evaluation by a gastroenterologist. Patients were excluded if they had a personal history of polyps, CRC, inflammatory bowel disease, familial adenomatous polyposis, or hereditary nonpolyposis colorectal cancer syndrome. Patient navigators facilitated adherence to SC among study participants through patient education and support for the procedure, which included 3 telephone calls: an initial scheduling call, a reminder call 2 weeks before the SC, and a final call 3 days before the procedure. Through these calls, navigators ensured that patients understood the instructions regarding the bowel preparation and logistics for the procedure.

Data collection

Patient information including demographics, age, sex, and self-reported race, date of referral, date of patient navigation contact, and date of SC were recorded in a database for the parent patient navigation study. Body mass index (BMI), taken at the visit when the patient was referred for the study, was categorized as obese (BMI ≥30) or non-obese. The patients were asked about their current and former tobacco use and were categorized as smokers (current or former use) or never smokers. The primary endpoint for the parent study was colonoscopy completion rates.

From this study population, colonoscopy findings and pathology results were analyzed from the electronic medical record. All of the original pathology specimens were analyzed by board-certified, expert GI pathologists at our institution. Adenoma prevalence was defined as the proportion of patients undergoing SC who had at least 1 adenoma. Advanced adenomas were defined as those ≥1 cm in diameter or with any villous component, high-grade dysplasia, or cancer. Prevalence of proximal lesions was defined as the proportion of patients with at least 1 adenoma located proximal to and including the splenic flexure. We analyzed colonoscopy completion rates, endoscopic findings—categorized by the most

advanced lesion on histology—and demographic factors associated with endoscopic findings.

Statistical analysis

All analyses were performed by using SPSS version 20 (IBM SPSS Inc, Chicago, Ill). Descriptive statistics were used to tabulate the demographic characteristics of the study population. Chi-square tests were used to evaluate whether there was a difference in prevalence of adenomas, advanced adenomas, and proximal lesions by sex, age, smoking status, and race/ethnicity. We conducted multivariate logistic regression analysis to evaluate the prevalence of adenomas, advanced adenomas, and proximal lesions.

Results

Study population

A total of 1329 patients were directly referred for SC through open-access endoscopy during the study period. Of these, 122 declined to participate in the patient navigation study, and 255 patients were deemed ineligible, withdrew consent, or died after consenting. Thus, a total of 954 qualified for patient navigation and were randomized to different types of patient navigation. Of these, 809 (84.8%) were successfully navigated through the SC process. There were no differences among the navigated and non-navigated patients based on age, sex, and race. Among navigated patients, 637 (78.7%) completed SC. Fifty-three (8.3%) of those who completed SC reported their race as other than black or Latino and were excluded from the final analysis. Thus, the study cohort in the present analysis consisted of 584 black and Latino individuals who were referred through open-access endoscopy and successfully navigated to SC completion.

Baseline characteristics of the cohort by race/ethnicity are shown in Table 1. Of the 584 patients, 314 (53.8%) were Latino, and 270 (46.2%) were black. The mean (± standard deviation) age was 59.3 ± 7.6 years, and 69% were female. The BMI was recorded for 435 patients during the referral clinic visit. Mean BMI was higher in black than in Latino participants ($P = .01$). More black individuals reported being current or former smokers compared with Latino individuals ($P < .0001$).

Results of screening colonoscopy

The quality of bowel preparation was reported as adequate to excellent in 541 of 580 patients (93.7%); only 39 (6.7%) had poor preparation, with rates identical between Latino and black participants. The overall cecal intubation rate was 546 of 579 (94.3%), with no difference among Latino (93.0%, 291/313) or black (95.6%, 255/266) participants.

The location, histology, number, and size of adenomas are shown in Table 2. One patient (0.2%), a 61-year-old black woman, was found to have CRC, stage IIa (T3N0M0), in the sigmoid colon, requiring laparoscopic resection. She elected to undergo adjuvant chemotherapy. Adenoma prevalence of the entire cohort was 26.4%: 27.7% in Latino and 24.8% in black participants ($P = .20$). Most of the adenomas were located in the proximal colon. A total of 68 Latino (21.7%) and 50 black participants (18.5%) had proximal

adenomas (*P* = .35), with or without distal lesions. Advanced adenomas occurred in 11.5%: 10.8% in Latino and 12.2% in black participants (*P* = .21). The prevalence of proximal advanced adenomas was 7.5%: 8.9% in Latino and 5.9% in black participants (*P* =.17). Sessile serrated polyps were detected in 0.9% of patients: 0.6% Latino and 1.1% black participants (*P* = .54). Overall, 15 patients (2.6%) had R3 adenomas.

The prevalence of adenomas, advanced adenomas, and proximal neoplasia did not differ significantly by race, sex, age, or BMI (Table 3). On multivariate regression analysis, current or former smokers were more likely to have adenomas (odds ratio [OR] 1.67; 95% confidence interval [CI], 1.05-2.63) and proximal adenomas (OR 2.09; 95% CI, 1.25-3.47) compared with those who never smoked, after adjusting for sex, age, and race (Table 4). Among patients aged R70 years, there was a trend toward statistical significance for increased prevalence of adenomas (OR 1.89; 95% CI, 0.95-3.79; *P* = .07) and proximal adenomas (OR 1.92; 95% CI, 0.90-4.09; *P* = .09).

Discussion

We herein report the pathological findings resulting from screening colonoscopy among asymptomatic, average-risk, black and Latino individuals aged ≥50 years in an urban U.S. community. Black and Latino participants demonstrated similar rates of adenoma prevalence, multiplicity, and proximal adenomas. Both groups had rather high rates of advanced adenomas and proximal advanced adenomas. The latter finding has implications for the use of screening techniques with high sensitivity in the proximal colon. It also has importance for estimating surveillance colonoscopy intervals.

Previous studies on adenoma distribution and location among Latino and black populations largely have been retrospective analyses.[14-19,23,24] Lieberman et al[14] used the Clinical Outcomes Research Initiative data and found that black participants had a higher prevalence of polyps O9 mm (as a surrogate for advanced adenomas), compared with white participants (7.7% vs 6.2%; *P* < .001) but no difference in the prevalence of proximal lesions. Another Clinical Outcomes Research Initiative-based study evaluating Latino individuals undergoing SC found no difference in prevalence of polyps ≥10 mm and proximal large polyps compared with white individuals.[17] However, these studies lacked histological confirmation. A recent study evaluated the prevalence of histologically confirmed adenomas among asymptomatic Latino, black, and white populations in New York City and reported significantly higher rates of adenomas, advanced adenomas, and isolated proximal adenomas among both Latino and black participants compared with white participants.[16] In contrast, an analysis of the Kaiser Permanente Northern California database showed no effect of race on adenoma prevalence but found an increased risk of proximal adenomas among black participants compared with white participants (adjusted OR 1.25; 95% CI, 1.04-1.54) but not among Latino participants.[24]

Interestingly, a recent cross-sectional analysis of pro-spectively collected data of SC found a lower overall prevalence of advanced adenomas among black individuals compared with white individuals (6.8% vs 5.0%; *P* = .039), although this effect was sex dependent.[25] Black men had a lower risk compared with white men, but no difference was found between black

and white women. Our study found the prevalence rates of adenomas, advanced adenomas, and proximal lesions to be at least as high as, and in some cases higher than, those of previously published studies.

A strength of the present study is that all patients were part of a prospective cohort study, allowing selection of patients who were truly average risk and asymptomatic, as compared with retrospective chart reviews that rely on documentation in past medical records to select patients, which may lead to misclassification of procedures as average-risk screening colonoscopies. In addition, all lesions were histologically confirmed by expert GI pathologists, permitting accurate data on prevalence of adenomas, advanced adenomas, and sessile serrated polyps. Moreover, we were able to confirm the high quality of the colonoscopic examinations as manifested by excellent cecal intubation and low poor bowel preparation rates. Patient navigation has been associated with lower rates of suboptimal bowel preparation.[26]

These strengths notwithstanding, our study has some limitations. All patients were navigated through the SC process, which may potentially select those who are more likely to comply with medical care. However, this should not influence the pathological findings on SC. Of note, all patients who were eligible for the patient navigation program were asymptomatic, with no known increased risk factors for CRC or colorectal adenomas, and only a small percentage of patients who were offered navigation refused. The fact that we found high rates of advanced adenomas and proximal advanced adenomas among this navigated cohort emphasizes the importance of promoting adherence to physician-recommended SC, and we believe that patient navigation is an important component of that process. Another potential limitation of the study is the lack of a comparison group of white patients. This is a consequence of the parent study, which specifically evaluated effectiveness of patient navigation in SC adherence among minorities.

To get at this latter issue, we compared our findings with those of other prospective SC studies performed in the United States, which enrolled predominantly white patients (Table 5). The Veterans Affairs Cooperative Study 380[12] evaluated findings of SC among asymptomatic, predominantly white male veterans. They reported prevalence rates of 36.5% for all adenomas, 10.5% for advanced adenomas, and 4.1% for proximal advanced adenomas. Schoenfeld et al[13] performed screening colonoscopy on women, predominantly white, and found that 20.4% had adenomas, and 4.9% had advanced adenomas. Our study showed a similar rate of adenomas but higher rates of advanced adenomas and a higher prevalence of proximal advanced adenomas.

In conclusion, the prevalence of adenomas, advanced adenomas, and proximal lesions was high among asymptomatic Latino and black patients at average risk for CRC undergoing SC. Overall rates of advanced adenomas and proximal advanced adenomas in this prospective study are higher than those of other SC trials enrolling predominantly white patients, and overall rates were higher than rates among black and Latino participants in retrospective series. Although previous studies suggest that black individuals have high rates of proximal advanced adenomas, we found even higher rates among our Latino population. The increased risk for clinically significant proximal lesions supports the use of screening

tests like colonoscopy that can detect proximal neoplasia among minorities for CRC screening and prevention.

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Abbreviations

BMI	body mass index
CRC	colorectal cancer
SC	screening colonoscopy

Take-home Message

- In a prospective screening colonoscopy study, black and Latino individuals demonstrated a high prevalence of adenomas, advanced adenomas, and proximal adenomas.
- This supports colonoscopy as the preferred screening technique in these populations and has implications for surveillance intervals.

Table 1

Baseline patient characteristics

	Total (n = 584)	Latino (n = 314)	Black (n = 270)	*P* value
Sex				
Female	406 (69.50%)	227 (72.3)	179 (66.3)	.12
Age, mean (SD), y	59.3 (7.6)	59.0 (7.6)	59.6 (7.6)	.35
50-59	318 (54.5%)	164 (52.2%)	154 (57.0%)	.84
60-69	200 (34.2%)	112 (35.7%)	88 (32.6%)	
≥70	66 (11.3%)	38 (12.1%)	28 (10.4%)	
Smoking status				
Current or former	277 (47.4%)	126 (40.1%)	151 (55.9%)	< .0001
BMI, mean (SD), (kg/m^2)*	31.7 (7.8)	30.8 (6.6)	32.7 (8.8)	.01
Obese, BMI ≥30	230/435 (52.9%)	109/225 (48.4%)	121/210 (57.6%)	.06
Poor bowel preparation†	39/580 (6.7%)	21/313 (6.7%)	18/267 (6.7%)	.99
Cecal intubation‡	546/579 (94.3%)	291/313 (93.0%)	255/266 (95.6%)	.13

Values are expressed as no. (%) unless otherwise indicated.

SD, Standard deviation; *BMI*, body mass index.

*BMI is available for 435 patients.

†Bowel preparation data available for 580 patients.

‡Cecal intubation information available for 579 patients.

Table 2

Adenoma location, histology, and size by race

	Total (n = 584)	Latino (n = 314)	Black (n = 270)	*P* value
Adenoma rates	154 (26.4)	87 (27.7)	67 (24.8)	.20
Proximal adenoma	118 (20.2)	68 (21.7)	50 (18.5)	.35
Advanced adenoma	67 (11.5)	34 (10.8)	33 (12.2)	.21
Proximal advanced adenoma	44 (7.5)	28 (8.9)	16 (5.9)	.17
Adenoma histology				
Tubular	128 (21.9)	76 (24.2)	52 (19.3)	.15
Tubulovillous	20 (3.4)	9 (2.9)	11 (4.1)	.42
Carcinoma	1 (0.2)	0 (0.0)	1 (0.4)	.28
Serrated	5 (0.9)	2 (0.6)	3 (1.1)	.54
High-grade dysplasia	8 (1.4)	3 (1.0)	5 (1.9)	.32
Adenoma size				
<1 cm	92 (15.8)	55 (17.5)	37 (13.7)	.21
≥1 cm	62 (10.6)	32 (10.2)	30 (11.1)	.72
≥3 adenomas	15 (2.6)	8 (2.5)	7 (2.6)	.97

Values are expressed as no. (%).

Table 3

Clinical predictors of adenoma prevalence and location

	Adenoma	*P* value	Proximal adenoma	*P* value	Advanced adenoma	*P* value	Proximal advanced adenoma	*P* value
Sex								
Male (n = 178)	44 (24.7)	.55	35 (19.7)	.83	21 (11.8)	.87	16 (9.0)	.38
Female (n = 406)	110 (27.1)		83 (20.4)		46 (11.3)		28 (6.9)	
Race								
Black (n = 270)	67 (24.8)	.43	50 (18.5)	.35	33 (12.2)	.6	16 (5.9)	.17
Latino (n = 314)	87 (27.7)		68 (21.7)		34 (10.8)		28 (8.9)	
Age, y								
50-59 (n = 318)	78 (24.5)	.33	60 (18.9)	.58	32 (10.1)	.48	20 (6.3)	.40
60-69 (n = 200)	54 (27.0)		42 (21.0)		27 (13.5)		19 (9.5)	
≥70 (n = 66)	22 (33.3)		16 (24.2)		8 (12.1)		5 (7.6)	
Body mass index, kg/m^2								
<30 (n = 205)	55 (26.8)	.70	43 (21.0)	.63	27 (13.2)	.30	15 (7.3)	.74
Obese, ≥30 (n = 220)	58 (25.2)		44 (19.1)		23 (10.0)		15 (6.5)	
Smoking status								
Never (n = 307)	69 (22.5)	.03	50 (16.3)	.01	29 (9.4)	.11	19 (6.2)	.20
Current/former (n = 277)	85 (30.7)		68 (24.5)		38 (13.7)		25 (9.0)	

Values are expressed as no. (%).

Table 4

Multivariate analysis of clinical predictors of adenoma prevalence and location

	Adenoma		Proximal adenoma		Advanced adenoma		Proximal advanced adenoma	
	OR (95% CI)	***P* value**	**OR (95% CI)**	***P* value**	**OR (95% CI)**	***P* value**	**OR (95% CI)**	***P* value**
Sex								
Female	1.0		1.0		1.0		1.0	
Male	1.11 (0.71-1.73)	.66	1.21 (0.74-1.97)	.45	0.77 (0.42-1.41)	.40	1.29 (0.60-2.76)	.52
Race								
Black	1.0		1.0		1.0		1.0	
Latino	0.62 (0.37-1.05)	.08	0.67 (0.38-1.18)	.16	0.84 (0.43-1.65)	.61	1.01 (0.44-2.34)	.98
Age, y								
50-59	1.0		1.0		1.0		1.0	
60-69	1.27 (0.79-2.06)	.33	1.30 (0.77-2.22)	.33	1.37 (0.72-2.59)	.34	1.61 (0.73-3.57)	.24
≥70	1.89 (0.95-3.79)	.07	1.92 (0.90-4.09)	.09	1.02 (0.36-2.90)	.97	1.14 (0.30-4.30)	.85
Smoking status								
Never	1.0		1.0		1.0		1.0	
Current/former	1.67 (1.05-2.63)	.03	2.09 (1.25-3.47)	.01	1.32 (0.71-2.46)	.37	1.39 (0.64-3.02)	.41

OR, Odds ratio; *CI*, confidence interval.

OR adjusted for sex, race, age, and smoking status.

Table 5

Findings of selected U.S. screening colonoscopy trials of asymptomatic participants

Reference	No. of participants	Male (%)	White (%)	Adenoma prevalence (%)	Advanced adenoma prevalence (%)	Proximal advanced adenoma prevalence (%)
Lieberman et al[12]	3121	97	84	36.5	10.5	4.1
Imperiale et al[10]	1994	59	–	–	5.6	2.5
Imperiale et al[11]	3025	68	90	–	3.4	2.7
Schoenfeld et al[13]	1483	0	77	20.4	4.9	–
Barclay et al[9]	2053	51	–	23.5	5.2	–
Present study—Latino	314	28	NA	27.7	10.8	8.9
Present study—black	270	34	NA	24.8	12.2	6.3

NA, Not applicable; –, not available.