RISK FACTORS FOR INTERVAL ADVANCED COLORECTAL NEOPLASIA AFTER SCREENING COLONOSCOPY: 10-YEAR FOLLOW-UP OF A PROSPECTIVE MULTI-CENTER COHORT IN THE UNITED STATES

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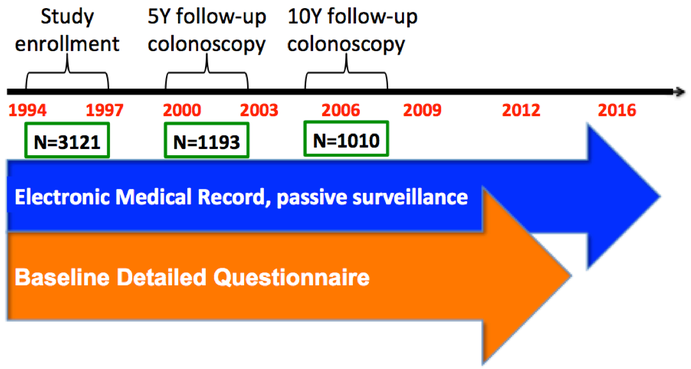
Introduction and Objective

- Colorectal cancer (CRC) is the 4th leading cause of cancer-related deaths globally. A vast majority of deaths are preventable. Knowledge of risk factors could inform risk reduction and screening strategies.
- To our knowledge, no other study has reported risk factors for advanced colorectal neoplasia (AN) in a screening cohort with baseline colonoscopy and repeat exams over a 10-year period.
- The objective of this study is to identify risk factors for AN up to 10 years after baseline screening colonoscopy in a U.S. cohort of asymptomatic participants.

Methods

- **Study Design:** We aimed to identify factors associated with interval AN during a 10-year follow-up period among a cohort of 1010 participants age 50-75. Participants underwent a screening colonoscopy and repeat colonoscopy between 5.5-10 years later at 13 Veterans Affairs Medical Centers. Risk factors were self-reported at baseline colonoscopy.
- **Outcomes:** AN included adenoma ≥1cm, villous histology, high-grade dysplasia, or carcinoma. Participants were classified by their most advanced lesion.
- **Statistical Analysis:** We performed a multivariable logistic regression analysis of risk for interval AN, adjusting for age, sex, race, tobacco use, alcohol use, BMI, CRC in a first degree relative, diabetes, baseline colonoscopy outcome, and outcome at 5 years.



Results

Table 1. Risk Factors for Advanced Neoplasia at 10 Years Based on Screening Colonoscopy Results

Characteristic	All Participants (n=1010)	No Neoplasia (n=677)	Small Adenoma (n=267)	Advanced Neoplasia (n=66)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Sex						
Female	27 (2.7%)	23 (3.4%)	2 (0.8%)	2 (3.0%)	0.89 (0.21 – 3.86)	1.49 (0.31-7.06)
Male	983 (97.3%)	654 (96.6%)	265 (99.3%)	64 (97.0%)	ref	ref
Race						
White	841 (83.3%)	552 (81.5%)	228 (85.4%)	61 (92.4%)	ref	ref
Black	101 (10.0%)	74 (10.9%)	26 (9.7%)	1 (1.5%)	0.12 (0.02 – 0.90)	0.13 (0.02-1.00)
Hispanic	47 (4.7%)	34 (5.0%)	9 (3.4%)	4 (6.1%)	1.07 (0.37 – 3.10)	1.45 (0.47-4.40)
Other	19 (1.9%)	15 (2.2%)	4 (1.5%)	0 (0.0%)	NA	NA
Age*						
50-59	400 (39.6%)	270 (39.9%)	112 (42.0%)	18 (27.3%)	ref	
60-69	482 (47.7%)	327 (47.7%)	122 (45.7%)	33 (50.0%)	1.51 (0.83 – 2.75)	1.09 (0.71-1.69)
70-75	128 (12.7%)	80 (11.8%)	33 (12.4%)	15 (22.7%)	2.81 (1.36 – 5.83)	
Tobacco Use*						
<50 pack years	505 (50.0%)	352 (52.0%)	132 (49.4%)	21 (31.8%)	ref	
≥50 pack years	230 (22.7%)	141 (20.8%)	60 (22.5%)	29 (44.0%)	3.45 (1.90 – 6.25)	
Never						ref
Prior						1.25 (0.63-2.47)
Current						0.89 (0.35-2.25)
Alcohol Use						
Never	575 (56.9%)	384 (56.7%)	148 (55.4%)	43 (65.2%)	ref	ref
1-14 drinks weekly	316 (31.3%)	212 (31.3%)	89 (33.3%)	15 (22.7%)	0.63 (0.34 – 1.16)	0.58 (0.30-1.10)
>14 drinks weekly	110 (10.9%)	76 (11.2%)	27 (10.1%)	7 (10.6%)	0.82 (0.36 – 1.90)	0.75 (0.30-1.78)
CRC in first degree relative						
None	846 (83.8%)	585 (86.4%)	206 (77.2%)	55 (83.3%)	ref	ref
1	142 (14.1%)	80 (11.8%)	55 (20.6%)	7 (10.6%)	0.93 (0.41 – 2.11)	0.95 (0.44-2.07)
≥2	9 (0.9%)	4 (0.6%)	2 (0.8%)	3 (4.6%)	7.99 (1.74 – 36.6)	1.63 (0.69-3.56)
Baseline Colonoscopy Finding						
No neoplasia	610 (60.4%)	458 (67.7%)	118 (44.2%)	34 (51.5%)	ref	ref
Small adenoma	278 (27.5%)	153 (22.6%)	110 (41.2%)	15 (22.7%)	1.32 (0.70 – 2.49)	0.95 (0.44-2.07)
Advanced neoplasia	122 (12.1%)	66 (9.8%)	39 (14.6%)	17 (25.8%)	3.47 (1.83 – 6.56)	1.63 (0.69-3.56)
5-Year Surveillance Colonoscopy Finding						
No 5-year colonoscopy	547 (54.2%)	401 (59.2%)	120 (44.9%)	26 (39.4%)	NA	NA
No neoplasia	240 (23.8%)	167 (24.7%)	63 (23.6%)	10 (15.2%)	ref	ref
Small adenoma	166 (16.4%)	82 (12.1%)	62 (23.2%)	22 (33.3%)	4.48 (2.03 – 9.90)	4.45 (1.94-10.23)
Advanced neoplasia	57 (5.6%)	27 (4.0%)	22 (8.24%)	8 (12.1%)	4.95 (1.79 – 13.6)	4.04 (1.53-14.07)
Diabetes						
No	952 (79.8%)	240 (80.5%)	497 (79.9%)	215 (78.8%)	ref	ref
Yes	241 (20.2%)	58 (19.5%)	125 (20.1%)	58 (21.3%)	1.24 (0.65 – 2.34)	1.18 (0.57-2.40)
BMI*						
<18.5	3 (0.3%)	2 (0.3%)	0 (0.0%)	1 (1.5%)	8.25 (0.67 – 101)	
18.5 – 24.9	180 (17.8%)	132 (19.5%)	40 (15.0%)	8 (12.1%)	ref	0.76 (0.56-1.02)
25-29.9	459 (45.5%)	291 (43.0%)	130 (48.7%)	38 (57.6%)	2.16 (0.98 -4.75)	
30-39.9	331 (32.8%)	225 (33.0%)	88 (33.0%)	18 (27.3%)	1.32(0.85 – 2.25)	
≥40	30 (3.0%)	23 (3.4%)	7 (2.6%)	0 (0.0%)	N/A	

Notes: The odds ratios compare AN to no neoplasia at repeat colonoscopy between 5.5 and 10.5 years. There are 547 participants who did not have a 5-year surveillance colonoscopy and were excluded from the multivariable analyses. *For the multivariable analyses, age was defined in 10-year intervals, BMI in 5 unit intervals, and smoking history by never, prior or current use.

Findings

- A total of 1010 participants underwent a baseline screening colonoscopy and at least one repeat colonoscopy between 5.5-10.5 years: 267 participants (26%) had small adenomas and 66 participants (6.5%) had AN. By race, 1/101 Black (1%), 61/841 White (7%), and 4/47 Hispanic (8%) participants developed AN.
- In univariate analyses, self-reported race, age, cumulative pack-year smoking history of ≥50 years, family history of CRC, and prior colonoscopy findings were related to 10-year AN risk while sex, alcohol use, diabetes, and BMI were not.
- In multivariable analyses, risk for interval AN between 5.5-10.5 years after baseline colonoscopy was only independently associated with 5-year findings of a small adenoma (OR, 4.45; 95%CI, 1.94-10.23) or AN (OR, 4.04; 95%CI, 1.53-14.07) and marginally associated with Black race (OR, 0.13; 95%CI, 0.02-1.00).

Conclusion

The most recent colonoscopy is a stronger predictor of AN risk over time than baseline screening colonoscopy, supporting current surveillance strategies.

Future Directions

- **We will continue passive surveillance and 20-year follow-up of this cohort.**
- **Continued AN risk over time will be evaluated.**

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