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Metachronous Advanced Neoplasia on Surveillance Colonoscopy in Young versus Older Onset Colorectal Cancer Patients

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The incidence of colorectal cancer (CRC) and cancer-related mortality has increased in patients <55 years old.[1] Consensus on optimal intervals for post-CRC surveillance colonoscopy in young patients is lacking. The primary endpoint of this study was comparison of rates of metachronous advanced neoplasia (AN) in patients diagnosed with CRC at <50 and 50–75 years. The secondary aim was to evaluate risk factors of metachronous AN.

Methods

Patients from 3 health systems within Cook County, IL with newly diagnosed CRC who underwent curative resection were identified through pathology records, endoscopy documentation software, and electronic medical records between 2006 and 2016. Exclusion criteria included first surveillance performed at >3 years, CRC diagnosed at age >75, familial adenomatous polyposis, serrated polyposis syndrome, Lynch syndrome, inflammatory bowel disease, inadequate bowel prep, and obstructive carcinoma without clearance colonoscopy within 6 months of diagnosis.

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Conflicts of interest

These authors disclose the following: Daniel Sussman has done consulting for ExactSciences Corp. Sonia S. Kupfer has a research collaboration with Myriad Genetics and does not receive financial compensation. Joshua Melson has done consulting for Clinical Genomics and has received independent investigator research support from Boston Scientific. The remaining authors disclose no conflicts.

Index colonoscopy was defined as colonoscopy at diagnosis of CRC and/or clearance colonoscopy within 6 months of resection. Right-sided cancer was defined as proximal to splenic flexure. AN was defined as adenoma ≥10 mm in endoscopic size, villous histology, or high-grade dysplasia. Patients with high-risk adenomas (HRAs) were defined by the presence of AN or ≥3 adenomas. The term *synchronous* refers to endoscopic findings at time of CRC diagnosis and/or clearance colonoscopy within 6 months. High-definition colono-scopes were used for colonoscopies during study period.

Variables were compared by using χ^2 or two-sided Fisher exact test, depending on sample size. Logistic regression analysis was performed to assess the risk factors of the outcome metachronous AN ($P < .05$ considered significant).

Results

Six hundred ninety-seven CRC patients (center 1 = 318, center 2 = 226, center 3 = 153) were included in analysis, with 92 patients <50 years of age. The overall 5-year metachronous CRC rate was 1.7%. The rate of metachronous AN in CRC patients at 5 years was not significantly different between patients <50 and 50–75 years (7.6% vs 9.8%, respectively; $P = .513$). Average time to first surveillance colonoscopy did not differ significantly between patients <50 and 50–75 years (1.20 ± 0.60 years vs 1.24 ± 0.56 years, respectively; $P = .492$). There was no interaction effect of age at CRC diagnosis and frequency of surveillance colonoscopies on metachronous AN ($P = .841$).

CRC patients diagnosed by age <50 had higher proportion of male patients (68.5% vs 47.9%; $P = .0002$), rectal cancer (44.6% vs 23.3%; $P < .0001$), and<left-sided CRC (77.2% vs 60.3%; $P = .002$). Patients 50–75 years old had higher proportion of aspirin users (32.4% vs 15.7%; $P = .001$), well-differentiated tumors (27.9% vs 15.2%; $P = .021$), synchronous adenoma (53.1% vs 37.0%; $P = .004$), ≥3 synchronous adenomas (20.0% vs 4.4%; $P = .0003$), and synchronous high-risk adenoma (29.6% vs 15.2%; $P = .004$). Body mass index (BMI) of patients differed significantly between young and older patients (31.5% vs 35.3% BMI ≥30 kg/m^2, respectively; $P = .010$).

Synchronous AN (15.8% vs 7.6%; $P = .002$), synchronous HRA (16.1% vs 6.9%; $P = .0002$), and ≥3 synchronous adenomas (15.2% vs 8.2%; $P = .016$) were significantly associated with metachronous AN. On univariate logistic regression adjusted for center, presence of ≥3 synchronous adenomas (odds ratio [OR], 2.00; 95% confidence interval [CI], 1.12–3.57; $P = .019$), presence of synchronous HRA (OR, 2.57; 95% CI, 1.53–4.30; $P = .0003$), and presence of synchronous AN (OR, 2.29; 95% CI, 1.34–3.9; $P = .002$) were significant predictors of metachronous AN, but age was not associated with AN (OR, 0.75; 95% CI, 0.33–1.71; $P = .50$). Presence of synchronous AN was the sole significant predictor of metachronous AN on multivariate logistic regression.

Discussion

The main finding of this study is that rates of metachronous AN at 5 years in patients diagnosed when age <50 are similar to those aged 50–75. The risk of metachronous AN

in CRC patients was correlated with synchronous AN. This suggests synchronous AN be considered in customizing personalized surveillance intervals.

The majority of our CRC patients were diagnosed before universal testing endorsed by U.S. Multisociety Task Force in 2014.[2] Many of our patients did not undergo screening for Lynch syndrome. Of patients <50 years at CRC diagnosis in our study, 59 of 92 had evaluation for the microsatellite stability pathway, with 49 without evidence of instability by either microsatellite instability or immunohistochemistry. Whether microsatellite instability unstable patients might harbor a different risk profile is an important question that deserves further study. It is possible that patients excluded for lack of surveillance colonoscopy received their care within another healthcare system after curative resection. Included and excluded patients had similar proportions of female patients (49.4% vs 53.2%, respectively; $P = .070$) as well as patients <50 years (13.1% vs 13.2%, respectively; $P = .311$). The included patients appear demographically representative of the total cohort. In sum, our study does not support more inten sive surveillance in younger patients with sporadic CRC than those >50 years.

Abbreviations used in this paper:

AN	advanced neoplasia
BMI	body mass index
CI	confidence interval
CRC	colorectal cancer
HRA	high-risk adenoma
OR	odds ratio

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. CA Cancer J Clin2018;68:7–30. [PubMed: 29313949]
2. Giardiello FM, Allen JI, Axilbund JE, et al.Guidelines on genetic evaluation and management of lynch syndrome: a consensus statement by the US multi-society task force on colorectal cancer. Gastroenterology2014;147:502–526. [PubMed: 25043945]

Table 1.

Analysis of Characteristics Associated With Metachronous Advanced Neoplasia

Characteristics	Patients with metachronous AN (n = 66)	*P* value[a]	Univariate *P* value[b]	Odds ratio (95% CI)
Age (y)				
<50	7 (0.08)	.51	.5	0.75 (0.33–1.71)
≥50	59 (0.10)			1 (reference)
Sex				
Female	28 (0.08)	.16	.15	0.69 (0.41–1.15
Male	38 (0.11)			1 (reference)
Race				
White	33 (0.08)	.34	Reference	1 (reference)
Black	25 (0.11)		.65	1.43 (0.78–2.62)
Other	8 (0.12)		.54	1.53 (0.67–3.49)
Smoking status				
Smoker	32 (0.01)	.62	.99	1.10 (0.65–1.85)
Nonsmoker	32 (0.09)			1 (reference)
Aspirin usage				
Yes	20 (0.10)	.92	.9	0.96 (0.55–1.68)
No	45 (0.10)			1 (reference)
First-degree family history				
Present	8 (0.10)	.83	.06	1.10 (0.50–2.41)
Absent	58 (0.09)			1 (reference)
Body mass index *(kg/m²)*				
18.5–24.9	16 (0.10)	.96	Reference	1 (reference)
<18.5	1 (0.08)		.89	0.78 (0.09–6.50)
25–29.9	23 (0.09)		.85	0.82 (0.42–1.62)
≥30	23 (0.10)		.91	0.91 (0.46–1.80)
Cancer location				
Colon	52 (0.10)	.35	.36	1 (reference)
Rectal	14 (0.08)			0.75 (0.40–1.39)
Cancer side				

Characteristics	Patients with metachronous AN (n = 66)	*P* value[a]	Univariate *P* value[b]	Odds ratio (95% CI)
Left	46 (0.11)	.08	.2	1 (reference)
Right	20 (0.08)			0.70 (0.40–1.21)
Tumor differentiation				
Well	22 (0.12)	.21	Reference	1 (reference)
Moderate	42 (0.10)		.2	0.69 (0.38–1.25)
Poor	1 (0.02)		.05	0.12 (0.02–0.90)
Cancer stage				
0	3 (0.13)	.4	.5	1.80 (0.47–6.89)
1	19 (0.08)	Reference	Reference	1 (reference)
2	25 (0.13)	.4	.2	1.75 (0.93–3.30)
3	16 (0.08)		.59	1.08 (0.54–2.18)
4	3 (0.08)		.56	0.94 (0.26–3.39)
Synchronous adenoma				
Present	40 (0.11)	.1	.095	1.56 (0.93–2.61)
Absent	26 (0.08)			1 (reference)
Synchronous AN				
Present	25 (0.16)	<.01	.002	2.29 (1.34–3.91)
Absent	41 (0.08)			1 (reference)
Side of synchronous AN				
Left	8 (0.14)	.07	Reference	1 (reference)
Right	9 (0.12)		.092	0.85 (0.30–2.39)
Both	8 (0.31)		.012	3.48 (1.08–11.27)
Synchronous HRA				
Yes	31 (0.16)	<.01	.0003	2.57 (1.53–4.30)
No	35 (0.07)			1 (reference)
≥3 synchronous adenomas				
Present	19 (0.15)	.02	.019	2.00 (1.12–3.57)
Absent	47 (0.08)			1 (reference)
Synchronous sessile serrated polyp				
Present	7 (0.14)	.23	.213	1.72 (0.73–4.01)
Absent	59 (0.09)			1 (reference)

Characteristics	Patients with metachronous AN (n = 66)	*P* value[a]	Univariate *P* value[b]	Odds ratio (95% CI)
Prep quality at index				
Fair	25 (0.10)	.59	.578	1.18 (0.66–2.10)
Good, excellent	38 (0.09)			1 (reference)

AN, advanced neoplasia; CI, confidence interval; HRA, high-risk adenoma.

[a] χ^2.

[b] Logistic regression.