

Risk of developing metachronous advanced colorectal neoplasia after colonoscopic polypectomy in patients aged 30 to 39 and 40 to 49 years

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Background and Aims: Current guidelines define postpolypectomy surveillance intervals in patients aged ≥ 50 years. The risk of metachronous colorectal neoplasia (CRN) and the optimal postpolypectomy surveillance interval in patients aged < 50 years remain unclear. We compared the risk of metachronous CRN in patients aged 30 to 39, 40 to 49, and ≥ 50 years.

Methods: We studied patients who underwent ≥ 1 adenoma removal between 2010 and 2014 and follow-up colonoscopic surveillance until 2017.

Results: Among 10,014 patients studied, 3242, 4606, and 2166 were 30 to 39, 40 to 49, and ≥ 50 years old, respectively. After high-risk adenoma removal, the 3-year risk of metachronous advanced CRN (ACRN) in patients aged 30 to 39 and 40 to 49 years was lower than in patients ≥ 50 years old (1.9% and 3.6% vs 8.1%, respectively; $P < .001$ and $.008$). After low-risk adenoma removal, the 5-year risk of metachronous ACRN in patients aged 30 to 39 and 40 to 49 years was lower than in patients ≥ 50 years old (2.8% and 3.3% vs 5.9%, respectively; $P = .010$ and $.031$). The risk of metachronous ACRN or ≥ 3 adenomas in patients aged 30 to 39 years was significantly lower than in patients aged 40 to 49 years. Age remained significantly associated with the risk of metachronous ACRN despite adjustments for potential confounders.

Conclusions: The risk of metachronous ACRN was lower in patients aged < 50 years than in those aged ≥ 50 years; thus, the postpolypectomy surveillance interval may be extendable to > 3 and 5 years in high-risk and low-risk adenoma groups, respectively, in patients aged < 50 years. (Gastrointest Endosc 2018; ■:1-9.)

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the fourth leading cause of cancer deaths globally.¹ Screening colonoscopy and polypectomy are known to be the most effective strategies to reduce the incidence and mortality of CRC.^{2,3} However, patients with adenomas show a higher risk of developing metachronous adenomas or cancer than patients without adenoma.^{4,5} Therefore, patients who undergo adenoma removal are recommended to undergo follow-up surveillance colonoscopic examination.^{4,6,7}

Abbreviations: ACRN, advanced colorectal neoplasia; CI, confidence interval; CRC, colorectal cancer; CRN, colorectal neoplasia; MSI, microsatellite instability.

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Current guidelines regarding postpolypectomy surveillance have introduced the concept of risk stratification based on characteristics of adenomas.^{4,6,7} These guidelines stratify adenomas into 2 risk groups depending on the probability of developing advanced colorectal neoplasia (ACRN) during surveillance and recommend a repeat screening colonoscopic examination every 10 years in individuals without adenomas, every 5 to 10 years in patients with low-risk adenomas, and every 3 years in those with high-risk adenomas.^{4,6,7} However, these guidelines have focused

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only on patients aged ≥ 50 years. Most previous studies investigating optimal colonoscopic surveillance intervals have also focused on patients aged ≥ 50 years.^{8,9}

Unfortunately, the incidence of CRC has recently increased among young adults aged < 50 years.¹⁰⁻¹³ Young-onset colorectal neoplasia (CRN) is an increasing concern. However, data regarding the risk of metachronous CRN in adults aged < 50 years are limited. Several studies have shown that older age is associated with an increased risk of metachronous CRN after adenoma removal.¹⁴⁻¹⁷ Given these results, it could be hypothesized that the risk of metachronous CRN in patients aged < 50 years may be lower than that in patients aged ≥ 50 years, and thus the surveillance interval required in this group does not need to be the same as that in those aged ≥ 50 years. However, no specific recommendations describe the optimal postpolypectomy colonoscopic surveillance intervals in patients with young-onset CRN.

Therefore, in this study, we aimed to compare the risk of metachronous CRN among patients aged 30 to 39, 40 to 49, and ≥ 50 years. We investigated whether it is necessary for patients aged < 50 years to undergo postpolypectomy surveillance colonoscopy at the same intervals as those applicable to patients aged ≥ 50 years.

METHODS

Study population

The Kangbuk Samsung Health Study is a cohort study comprising South Korean men and women aged ≥ 18 years who underwent a comprehensive annual or biennial health examination at clinics associated with the Kangbuk Samsung Hospital Total Healthcare Center in Seoul and Suwon, South Korea. The study population comprised a subset of the Kangbuk Samsung Health Study subjects who had undergone a screening colonoscopic examination as a component of a comprehensive health examination between 2010 and 2017. Inclusion criteria for the study were individuals who underwent their first colonoscopic examination (index colonoscopy) between January 2010 and December 2014 and another follow-up surveillance colonoscopy by December 2017 and those who showed ≥ 1 adenomas at the index colonoscopy (all polyps were removed endoscopically at the index colonoscopy). We retrospectively analyzed data obtained from a prospectively established cohort.

In South Korea, the Industrial Safety and Health Law mandates annual or biennial health screening examinations of all employees, which are performed free of charge. Most individuals in our study were employees of various companies and local governmental organizations or their spouses. As part of their welfare policy, companies often subsidize comprehensive health examinations including colonoscopy, regardless of current guidelines. Such programs are popular in Korea.^{18,19} Colonoscopy is not mandatory by law but an optional test that can be chosen

by participants themselves among several tests. Although Korean guidelines recommend that persons at average risk of CRC begin screening colonoscopy at age 50 years,²⁰ some participants chose colonoscopy among optional tests in spite of their young age. The selection of a screening test such as colonoscopy was decided based solely on the screenee's preference. Between 2010 and 2014, a total of 350,060 subjects participated in our health screening program, and 43.7% ($n = 153,003$) chose colonoscopy among several optional tests.

The setting of the study was a medical examination center rather than a clinic. Before colonoscopy, interviews by general practitioners were conducted to ensure that all participants were asymptomatic (ie, no abdominal pain, diarrhea, or hematochezia). Participants with symptoms were urged to seek medical care.

Exclusion criteria were patients with a history of CRC or colorectal surgery, diagnosed with CRC at the time of the index colonoscopy, with a history of inflammatory bowel disease, poor bowel preparation, and aged < 30 years. Poor bowel preparation was defined as "large amounts of solid fecal matter observed in the bowel precluding a satisfactory study, unacceptable preparation, or a condition in which $< 90\%$ of the mucosa could be adequately visualized."²¹

This study was approved by the Institutional Review Board of Kangbuk Samsung Hospital (IRB number 2017-11-011). The requirement for informed consent was waived because only deidentified data were retrospectively accessed.

Measurements and definitions

Data pertaining to medical history and health-related behaviors were obtained through a self-administered questionnaire. Family history of CRC was defined as the occurrence of CRC in ≥ 1 first-degree relatives at any age. Self-reported use of nonsteroidal anti-inflammatory drugs regularly over the month before enrollment in the study was recorded. Obesity was defined as a body mass index ≥ 25 kg/m² (the proposed cut-off for the diagnosis of obesity in Asians).²²

Colonoscopic and histologic examinations

All colonoscopic examinations were performed using the EVIS LUCERA CV-260 colonoscope (Olympus Medical Systems, Tokyo, Japan). Between 2010 and 2017, a total of 52 endoscopists performed colonoscopy; each year, 17 to 23 of the 52 endoscopists performed colonoscopy. All were experienced, board-certified endoscopists who had performed at least 1000 colonoscopies.

Suspicious neoplastic lesions were examined by taking a biopsy sample or were removed via polypectomy or EMR. All specimens were histopathologically assessed by experienced GI pathologists. Overall, CRN was defined as an identified cancer or any adenoma, and ACRN was defined as an identified cancer or advanced adenoma. Advanced adenoma was defined as the presence of 1 of the following features: a lesion measuring ≥ 10 mm in diameter, showing a tubulovillous or villous structure, and high-grade dysplasia.⁴ All

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