Risk factors for colorectal neoplasia in persons aged 30 to 39 years and 40 to 49 years

Yoon Suk Jung, MD,[1] Seungho Ryu, MD, PhD,[2,3] Yoosoo Chang, MD, PhD,[2,3] Kyung Eun Yun, MD,[3] Jung Ho Park, MD, PhD,[1] Hong Joo Kim, MD, PhD,[1] Yong Kyun Cho, MD, PhD,[1] Chong Il Sohn, MD, PhD,[1] Woo Kyu Jeon, MD, PhD,[1] Byung Ik Kim, MD, PhD,[1] Dong Il Park, MD, PhD[1]

Seoul, Korea

Background: Very little is known about risk factors associated with colorectal neoplasia in persons aged <50 years. In particular, there has been no study thus far focusing on the risk factors for colorectal neoplasia in persons aged 30 to 39 years.

Objective: To investigate risk factors for colorectal neoplasia in persons aged 30 to 39 years and 40 to 49 years and to compare those data with those of persons aged 50 to 59 years.

Design: Cross-sectional observational study.

Setting: Screening center in a university hospital in Korea.

Patients: A cohort of 28,504 Korean adults (13,678 aged 30-39 years, 12,507 aged 40-49 years, and 2319 aged 50-59 years) who underwent colonoscopy as part of their routine preventive health care.

Interventions: Colonoscopy.

Main Outcome Measurements: Risk factors for colorectal neoplasia in persons aged 30 to 39 years and 40 to 49 years.

Results: In the 30-to-39–years group, male sex, smoking, fatty liver, metabolic syndrome (MetS), obesity, elevated fasting blood glucose levels, and elevated triglyceride levels were associated with overall neoplasia, whereas for advanced neoplasia, the independent risk factors were smoking, fatty liver, and elevated triglyceride levels. Moreover, the prevalence of overall neoplasia in men aged 30 to 39 years exhibiting all risk factors was not lower than that in average-risk women aged >50 years (20.8% vs 18.8%; $P = .546$). The risk factors of overall neoplasia in the 40-to-49–years group were similar to those in the 30-to-39–years group. For advanced neoplasia, the independent risk factors in the 40-to-49–years group were male sex, smoking, MetS, and obesity.

Limitations: Selection bias may exist for participants of ethnic Korean heritage in 2 centers.

Conclusion: Obese male smokers with fatty liver and MetS might benefit from screening colonoscopy starting before age 50 years. (Gastrointest Endosc 2015;81:637-45.)

Guidelines from multiple professional societies recommend that persons at average risk for colorectal cancer (CRC) begin screening colonoscopy at age 50 years, and that persons with family histories of colorectal neoplasia or personal histories of inflammatory bowel disease undergo screening colonoscopy earlier.[1-3] This age cutoff is based on the fact that the prevalence of advanced adenomas and the incidence of CRC increase with age.[4-6]

However, the higher detection rate of colorectal neoplasia in men and smokers has led some authors to propose refining the screening recommendations to include sex and/or smoking, along with age and family history of CRC.[5-8]

A recent study suggested that men with abdominal obesity or metabolic syndrome (MetS) might benefit from screening colonoscopy starting at age 45 years.[9] Although the single age threshold for average-risk persons is simple and convenient, it may be insufficient as a basis on which to recommend screening colonoscopy. Moreover, it has been reported that nearly 7% to 9% of CRC cases occur in persons aged <50 years,[10,11] and CRC incidence rates are increasing among persons aged <50 years.[11-14] In addition, some studies have shown that patients aged <50 years have more aggressive disease and worse outcomes than older patients.[15] Consequently, decisions about whether and how to screen persons aged <50 years are of importance. Nevertheless, the epidemiology of colorectal adenoma in this age group has not been studied sufficiently. Although several studies have reported the prevalence of colorectal neoplasia in persons aged <50 years,[5,10,11,16] data regarding the risk factors for colorectal neoplasia in this age group are extremely limited. To date, a few studies have investigated the risk factors for colorectal neoplasia in persons aged 40 to 49 years.[7,9] However, there has been no study thus far focusing on the risk factors for colorectal neoplasia in persons aged 30 to 39 years. Identification of risk factors for colorectal neoplasia in persons aged 30 to 39 years may make it possible to target subgroups more likely to benefit from screening before age 50 years.

The aim of this study was to investigate the risk factors for colorectal neoplasia in persons aged 30 to 39 years and 40 to 49 years and to compare the data with those of persons aged 50 to 59 years. We also sought to determine whether purported risk factors for colorectal neoplasia would be associated with an increased likelihood of having colorectal neoplasia in younger age groups.

PATIENTS AND METHODS

Study population

The study population consisted of persons who had undergone a colonoscopy as part of a comprehensive health screening program at the Total Healthcare Center of Kangbuk Samsung Hospital, Seoul and Suwon, Korea between 2010 and 2011 (N = 62,171).[17] In Korea, the Industrial Safety and Health Law requires employees to participate in annual or biennial health examinations. Approximately 60% of the participants were employees of various companies and local governmental organizations, or their spouses, and the remaining participants registered individually for the program. In most Korean companies, the mandatory retirement age is approximately 55. 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] This is the reason the database had a relatively large group of patients aged <50 years.

The setting of the study was a medical examination center, not a clinic center. Before colonoscopy, interviews by general practitioners were conducted to ensure that all participants were asymptomatic (ie, no lower abdominal pain or hematochezia). Persons with symptoms were urged to seek medical care.

Participation was limited to persons who had undergone their first colonoscopy screening. Exclusion criteria were as follows: a history of colon examination, colorectal surgery, or colorectal neoplasia (n = 10,421), a history of inflammatory bowel disease (n = 173), an incomplete colonoscopy such as poor bowel preparation or colonoscopy in which the cecum was not reached (n = 5455), lack of adequate biopsy (n = 853), incomplete questionnaire answers (n = 15,992), and missing data on anthropometry (n = 127). Some individuals met >1 criterion for exclusion. The total number of potential participants for the study was 29,150 (Fig. 1).

This study was approved by the Institutional Review Board of Kangbuk Samsung Hospital, which exempted the requirement for informed consent because we accessed only de-identified data, retrospectively.

Measurements and definitions

Data on medical history and health-related behavior were collected through a self-administered questionnaire (Appendix, available online at www.giejournal.org), whereas physical measurements and serum biochemical parameters were measured by trained staff. The amount of smoking (pack-years) was assessed. Details regarding alcohol use included the frequency of intake per week and the average amount of intake per episode. Family history of CRC was defined as CRC in ≥1 first-degree relatives at any age. The weekly frequency of moderate or vigorous physical activity and the level of educational attainment were assessed. Regular exercise was defined as ≥1 time per week, and advanced education was defined as a university graduate or higher. Self-reported use of aspirin (regular use over the previous month) was assessed. The presence or absence of fatty liver was examined through abdominal US. A US diagnosis of fatty liver was made on the basis of 4 known criteria, namely, hepatorenal echogenic contrast, liver brightness, deep attenuation, and vascular blurring.[19] In our study, abdominal US was performed by using a 3.5-MHz transducer (Logiq 9; General Electric, Madison, Wis) by 11 experienced radiologists who were unaware of the aims of the study and blinded to the laboratory values and clinical information. To assess the intraobserver and interobserver reliability of the US diagnosis of fatty liver, a random sample of 200 stored US images were re-read at least 2 weeks apart by the 11 radiologists. The interobserver reliability and intraobserver reliability for fatty liver diagnosis were substantial (kappa statistic of