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New study finds strong association between smoking and flat precancerous polyps

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According to a new study, smoking was found to have a strong association with the presence of flat adenomas (precancerous polyps) in the colon and may explain the earlier onset of colorectal cancer in smokers, as well as the advanced stage with which they present when compared to nonsmokers. Flat adenomas are more difficult to detect and have more aggressive pathology than the typical raised type of polyp detected during colorectal cancer screening. The study appears in the June issue of *GIE: Gastrointestinal Endoscopy*, the monthly peer-reviewed scientific journal of the American Society for Gastrointestinal Endoscopy (ASGE).

Colorectal polyps are growths that reside in the lining of the colon (large intestine) or rectum. It is believed that most colorectal cancers start as a small colorectal polyp known as an adenoma. Flat nonpolypoid adenomas are considered to be more aggressive than polypoid (raised) adenomas. Therefore, it is recommended that all adenomatous polyps be removed. Removal of colorectal polyps is key in preventing colorectal cancer. Studies have shown that the removal of polyps results in a decrease in the development of colorectal cancer.

"Little is known regarding the risk factors for these flat lesions, which may account for over one-half of all adenomas detected with a high-definition colonoscope. Smoking has been shown to be an important risk factor for colorectal neoplasia in several screening studies," said study lead author Joseph C. Anderson, MD, Neag Comprehensive Cancer Center, University of Connecticut Health Center, Farmington, Conn.

"The aim of this study was to investigate smoking as a risk factor for flat adenomas in an average risk population undergoing screening colonoscopy. In 600 asymptomatic patients who underwent screening colonoscopy, smoking was associated with the presence of flat adenomas."

Colonoscopy is recommended as the primary screening method for colorectal cancer because of the ability to diagnose and remove polyps before they become cancer. A new generation of endoscopes are being developed that utilize high definition imaging with stunning detail. High definition provides a clearer picture for the endoscopist to look at and provides more information due to the increased resolution of the picture. When endoscopists are trying to find small polyps, early cancer and flat lesions, the addition of high definition may further improve identification of these abnormalities.

Patients and Methods

This study was a prospective cross-sectional examination of consecutive asymptomatic patients undergoing screening colonoscopy for colorectal cancer at Stony Brook University Medical Center (General Clinical Research Center), Stony Brook, New York, between November 2006 and October 2007. Demographic data, known colorectal cancer risk factors, medication, family history of colorectal cancer, diet, exercise, alcohol intake, and history of diabetes and cholecystectomy were recorded. Patients were asked about current or past cigarette use, the number of packs per day, the number of years they had smoked, the year of cessation for those who had quit, and any changes in their past smoking patterns. These figures were used to calculate exposure in pack-years. Patients were divided into groups: nonsmokers, heavy smokers (10 or greater pack-years and still smoking or quit within the past 10 years), and low-exposure smokers (less than 10 pack-years or those who quit more than 10 years earlier).

A total of 600 patients, median age 56 years (252 men and 348 women) completed colonoscopy. There were 313 nonsmokers, 115 heavy smokers and 172 low-exposure smokers. In the heavy smoker group, most had smoked more than 20 pack-years. Compared with nonsmokers, the heavy smokers were more likely to describe themselves as white, regularly using NSAIDs, eating more red meat, and consuming fewer fruits and tomato products. The main analysis compared the nonsmokers to the heavy smokers (low-exposure smokers were removed from the main analysis).

One endoscopist using a high-definition wide-angle colonoscope performed all colonoscopies. All polyps were photodocumented and retrieved for histology and morphologic classification (flat or polypoid). Two experienced endoscopists confirmed the morphology for a representative group of adenomas that were randomly selected from the analyzed sample. Univariate analyses were performed and risk factors were entered into multivariate logistic regression models.

Results

There were 127 patients who had one or more flat adenomas of any size in the analyzed sample of 428 (313 nonsmokers and 115 heavy smokers). Heavy smoking, age and male gender were all statistically associated with any flat adenomas of any size. In addition, researchers observed that heavy smoking, body mass index, gender and red meat consumption had associations with having an advanced flat adenoma. After a multivariate analysis, heavy smoking was the only variable that was found to be predictive of advanced flat colorectal neoplasia.

The researchers concluded that smoking is an important risk factor for flat colorectal adenomas. Not only was smoking associated with all flat adenomas, it was also a risk factor for those patients who only had flat adenomas that were greater than 6 mm in diameter. These patients did

not have any polypoid adenomas. The study may explain the observation that smokers often present with colorectal cancer at a younger age and at a more advanced stage than nonsmokers.

They also state that their findings are important because detecting these adenomas may require special high-definition colonoscopes. The researchers observed that most flat adenomas were found on the right side of the colon, suggesting advanced imaging, such as chromoendoscopy, may help identify these lesions in smokers. Chromoendoscopy, an endoscopic technology, is performed by spraying specialized nonpermanent stains or dyes on the lining of the intestine during the endoscopic procedure to improve visualization.

In an accompanying editorial, Dayna Early, MD, Washington University School of Medicine, St. Louis, Mo., states "Few would argue that flat lesions are more difficult to identify than polypoid lesions, and although the Anderson et al study suggests that more advanced imaging should be used in smokers to detect flat colorectal neoplasia, data to support this approach are not available from their study."

"Ongoing emphasis should be placed on high-quality screening examinations and good bowel preparation because these are critical in detecting right-sided lesions. Finally, we should be on the lookout for flat adenomas not only in smokers, but in all patients undergoing screening colonoscopy and use the best technology available to us to do so," said Dr. Early. In addition, the editorial points out that these data can be used by physicians in counseling patients about the risks of smoking and colorectal cancer screening for smokers.

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