A recent study has shown that screening for colorectal cancer (CRC) with fecal occult blood testing (FOBT) results in a relatively low rate of diagnostic colonoscopies over a 10-year period (Cancer Epidemiol Biomarkers Prev. 2013;22:1612-1619).

“Some people have said that the only reason FOBT works is because everyone ends up getting a colonoscopy anyway due to false-positive results,” says Durado Brooks, MD, MPH, director of prostate and colorectal cancers at the American Cancer Society. “This study shows that is not the case and therefore not the only reason FOBT is an effective screening method.”

Both colonoscopy and FOBT are options for CRC screening. For those at an average risk of developing CRC, screening should start at age 50 years. The 2 screening options most often selected are colonoscopy every 10 years and annual FOBT. While FOBT is noninvasive, if a positive result is found, then a colonoscopy is recommended. Over the course of multiple years of screening, false-positive FOBT results leading to colonoscopies may occur often enough that the advantage of using the noninvasive test is lost for some patients.

Rebecca Hubbard, PhD, associate investigator in the biostatistics unit at the Group Health Research Institute in Seattle, Washington, and colleagues set out to find the characteristics of, and percentage of, individuals who received a false-positive FOBT result during 10 years of screening. Researchers evaluated the risk of a false-positive FOBT result using records from Group Health Cooperative, a large Washington State-based health care system with about 600,000 members. Individuals aged 50 to 79 years with no history of CRC who underwent FOBT between 1991 and 2009 were included. Patients with a history of inflammatory bowel disease were excluded based on the increased risk of CRC among such individuals.

The cumulative risk of 2 outcomes was evaluated: a positive FOBT with no CRC detected within 12 months (FOBT+/CRC−) and a positive FOBT followed by diagnostic colonoscopy within 12 months with no cancer detected (FOBT+/colonoscopy/CRC−). Each person’s first and subsequent FOBT results were included up until a colonoscopy was performed, a diagnosis of CRC was given, death occurred, or they left Group Health. Some positive FOBT results may have been followed by a colonoscopy that detected an adenoma, but this outcome was not captured.

Study Results
Researchers observed 181,950 FOBT results from 94,637 individuals. The rate of FOBT+/CRC− was 4.4%, the CRC incidence was 3.5 per 1000 tests, and the true-positive rate of FOBT was 1.9 per 1000 tests. In the entire cohort, other screening tests in addition to colonoscopy were as follows: flexible sigmoidoscopy (39%), barium enema (8%), and computed tomography colonography (0.03%). Individuals who were nonwhite, older, or male were more likely to have an FOBT+/CRC− result at their first test. After their first FOBT, 4.6% of individuals received an FOBT+/CRC− result at each screening round, and about 75% of individuals with positive results underwent a colonoscopy within 12 months of FOBT. The probability of an FOBT+/CRC− result decreased in subsequent screenings, and the probability that a positive FOBT would be followed by a colonoscopy increased.

Among patients with positive FOBT results, the odds of undergoing a colonoscopy within the subsequent year were significantly lower for people of Asian American/Pacific Islander descent and those aged 75 to 79 years than they were for white individuals or those aged 50 to 54 years, respectively.

Overall, researchers estimated the percentage of individuals who received an FOBT+/CRC− result during 10 years of annual screening with FOBT to be 23%. With biennial screening, this risk fell to 10.4%.

“The 23% rate of colonoscopy was an exciting finding because it means that a regimen of annual FOBT screening really does reduce the risk of being exposed to the discomfort and potential adverse effects of colonoscopy,” says Dr. Hubbard. This risk was lower for patients who began screening at age 50 years, and higher for individuals who started...
screening at age 65 years. After 10 years of screening, the cumulative probability of a true-positive result was 0.6% with annual screening and 0.4% with biennial screening.

“The main strengths of our study are its large size and length of follow-up,” adds Dr. Hubbard. “We included 13 years of data from over 94,000 individuals. An additional strength is that we used data from routine clinical care, which allowed us to evaluate the real-world risks of FOBT. In a more idealized setting, such as a clinical trial, the risks of FOBT might be underestimated if, for instance, all patients received extensive guidance on dietary restrictions prior to using the FOBT kit. In routine practice, not everyone reads or understands the instructions for using the kit, increasing the risk of a false-positive,” she notes.

“A limitation of our study is that not everyone with a positive FOBT result received a follow-up evaluation with diagnostic colonoscopy,” Dr. Hubbard continues. “Some of these individuals may have had a cancer that did not become symptomatic within a year of their FOBT. They would have been erroneously classified as false-positives when they were actually true-positives.”

**Clinical Implications**
Dr. Brooks states that although they have never been compared head-to-head in a randomized clinical trial, modeling studies have shown that annual FOBT is nearly as effective as colonoscopy every 10 years. “Clinicians may think they are offering substandard care, but they are not if the test is done properly,” he says. “Also, many patients have been shown to prefer FOBT over colonoscopy and are more likely to follow through on a screening recommendation when offered FOBT versus colonoscopy or when given the option to use either test,” he adds.

Dr. Brooks believes the evidence is clear that FOBT should remain an option for CRC screening. The fact that most or all of the testing in this current study was performed using older guaiac tests makes it even more convincing. “The newer guaiac tests or fecal immunochemical tests are better and have higher sensitivity and specificity than the older tests; these are the tests now recommended in screening guidelines from most organizations,” he adds.

“Our study was about ensuring that FOBT doesn’t end up essentially working like that coin flip, reducing colorectal cancer mortality by just sending everyone on to colonoscopy,” says Dr. Hubbard. “What we found was a pretty resounding no. FOBT has previously been demonstrated to reduce colorectal cancer mortality, and this benefit can be achieved without a lot of cancer-free individuals receiving colonoscopies.”

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