Improved DNA stool test could detect digestive cancers in multiple organs

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Mayo Clinic researchers have demonstrated that a noninvasive screening test can detect not only colorectal cancer but also the common cancers above the colon -- including pancreas, stomach, biliary and esophageal cancers. This study is presented at Digestive Disease Week 2009 in Chicago, May 30 - June 4.

Gastrointestinal (GI) cancers account for approximately one in four cancer deaths. While high cure rates can be achieved with early-stage detection for each type, only colorectal cancer is currently screened at the population level. Most people associate colorectal cancer screening with invasive colonoscopy, but previous Mayo Clinic research has shown that stool DNA testing can identify both early-stage colorectal cancer and precancerous polyps. Researchers are now studying the use of noninvasive stool DNA testing to detect lesions and cancer throughout the GI tract.

"Patients are often worried about invasive tests like colonoscopies, and yet these tests have been the key to early cancer detection and prevention," says David Ahlquist, M.D., Mayo Clinic gastroenterologist and lead researcher on the study. "Our research team continues to look for more patient-friendly tests with expanded value, and this new study reveals an opportunity for multi-organ digestive cancer screening with a single noninvasive test."

The researchers studied 70 patients with cancers throughout the digestive tract. Besides colon cancer, the study looked at throat, esophagus,

stomach, pancreatic, bile duct, gallbladder and small bowel cancers to determine if gene mutations could be detected in stool samples. Using a stool test approach developed at Mayo Clinic, researchers targeted DNA from cells that are shed continuously from the surface of these cancers. Also studied were 70 healthy patients. Stool tests were performed on cancer patients and healthy controls by technicians unaware of sample source. The stool DNA test was positive in nearly
70 percent of digestive cancers but remained negative for all healthy controls, thus demonstrating the approach's feasibility.

Stool DNA testing detected cancers at each organ site, including 65 percent of esophageal cancers, 62 percent of pancreatic cancers, and 75 percent of bile duct and gallbladder cancers. In this series,
100 percent of both stomach and colorectal cancers were detected. Importantly, stool test results did not differ by cancer stage; early-stage cancers were just as likely to be detected as late-stage cancers.

"It's very exciting to see this level of sensitivity for digestive cancer detection in our first look at this test application," says Dr. Ahlquist, "Historically, we've approached cancer screening one organ at a time. Stool DNA testing could shift the strategy of cancer screening to multi-organ, whole-patient testing and could also open the door to early detection of cancers above the colon which are currently not screened. The potential impact of this evolution could be enormous."

In October 2008, this Mayo Clinic research team published results of a multicenter study using first-generation stool DNA testing. In the seven-year, multicenter study (*Ann Intern Med* 2008;149:441-50), researchers found that the first-generation stool DNA tests were better than fecal blood tests for detecting cancer and precancerous polyps of the colon. In January 2009 (*Gastroenterology* 2009;136:459-70), Mayo researchers published some technical improvements that nearly doubled the sensitivity of stool DNA testing for detecting premalignant polyps and

increased cancer detection to about 90 percent, which is the approximate rate of detection observed for CT colonography.

Researchers hope that the next generation tests will have significant improvements in accuracy, processing speed, ease of patient use and affordability. "We anticipate that next generation tests will also be able to predict the tumor site, which will help physicians direct diagnostic studies and minimize unnecessary procedures," says Dr. Ahlquist.

Source: Mayo Clinic (news : web)