New test for improving population-based colorectal cancer screening

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A new stool test appears to detect colorectal cancer precursors better than the current fecal immunochemical test. This could further reduce the number of new colorectal cancer cases as well as the number of

people dying from the disease. A study led by the Netherlands Cancer Institute compared both tests.

Their results are published in *The Lancet Oncology*.

Each year worldwide, approximately 1.9 million people are diagnosed with colorectal cancer, and 935,000 people lose their lives as a result of the condition. If detected early, colorectal cancer is curable. However, by the time symptoms such as weight loss or blood in the stool appear, it is often too late. That is why many countries have introduced population-based screening programs. In The Netherlands, for example, people between the ages of 55 and 75 are invited to be tested every two years.

Most population-wide screening programs use the fecal immunochemical test (FIT), a stool test that measures the presence of the blood protein hemoglobin. Worldwide, colorectal cancer screening programs have proven to be successful in diagnosing colorectal cancer at earlier stages and reducing colorectal cancer mortality.

Three proteins

"The current test performs well but leaves room for improvement," says Gerrit Meijer, principal investigator at the Netherlands Cancer Institute. "We want to be able to detect the tumors before they have become invasive, that is at the stage of larger premalignant polyps. Treating physicians then can remove these polyps during a colonoscopy, rather than by surgery."

Meijer and his colleagues at the Netherlands Cancer Institute, the Amsterdam UMC and Erasmus MC have been working on a new test for years. This multitargetFIT-test (mtFIT) measures hemoglobin and two additional proteins. An earlier retrospective study demonstrated promising results.

Cancer precursors

Today, the researchers published the results of a much larger, prospective study that compared the mtFIT to the current FIT in over 13,000 participants of the Dutch national population-based screening program. The study was a success.

"The new test can detect cancer precursors more effectively," Meijer explains. "Our results predict that the test can reduce the number of new cases of colorectal cancer and mortality resulting from it." For participants, the new test is just as easy to use as the current test.

More true-positive results

The new test yielded more positive results than the current test. While this led to more colonoscopies, with the new mtFIT test, doctors found abnormalities in 299 persons, compared to 159 persons with the current FIT test. This difference mainly concerned persons with a high-risk precursor of colon cancer (216 versus 114). Meijer says, "The new test detects more larger polyps without a significant increase in 'false-positive' results and thus unnecessary colonoscopies."

The exact number of colorectal cancer cases that could be prevented with this new test depends on the way the current FIT test is used in different countries.

Meijer says, "The Dutch screening program applies a relatively high cutoff value to consider the FIT test positive, meaning unfavorable. Here, the new mtFIT test could lead to 21% fewer cases of colorectal cancer and 18% fewer mortalities. In countries that already use a lower FIT cutoff value, these figures would be lower, but likely at least 5% fewer people would develop colorectal cancer, with at least 4% fewer

mortalities. In both scenarios, the new test could be cost-effective."

Implementation of mtFIT in existing FIT-based screening programs will be relatively easy because both tests basically require the same screening logistics.

"This is exceptionally good news," says Meijer. The new test cannot replace the current population screening test just yet. "The critical next step is to produce the test at an industrial scale according to European diagnostic test guidelines. To this end we founded the company CRCbioscreen, to enable the test to benefit CRC screening participants in the Netherlands and beyond."

More information: The multitarget faecal immunochemical test for improving stool-based colorectal cancer screening programmes: a Dutch population-based, paired-design, intervention study, *The Lancet Oncology* (2024). DOI: 10.1016/S1470-2045(23)00651-4

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