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Early Detection of Colorectal Cancer: Immunological Tests for More Accurate Detection of Cancer Precursors

The detection of hidden blood in the stool (fecal occult blood) is an important part of the early detection of colorectal cancer. Scientists of the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) have now shown that a number of immunological tests are significantly superior to the commonly used enzymatic method (HaemOccult). However, the scientists found a wide variance in diagnostic performance of tests by different providers.

A large portion of the almost 73,000 colorectal cancers diagnosed in Germany each year could be avoided. If precancerous lesions – growths of the intestinal mucosa called adenomas – are detected and removed at an early stage, there is a great chance that cancer will not develop at all.

Therefore, statutory health insurances in Germany offer a fecal occult blood test free of charge for all insured persons from the age of 50. This test can detect precursors of colorectal cancer. In addition, persons from the age of 55 are entitled to receive an endoscopic examination of the colon (colonoscopy) once every 10 years.

A colonoscopy identifies precancerous lesions with a certainty of over 90 percent. Nevertheless, due to reluctance to take the examination, only about 30 percent of those entitled to it actually do so (extrapolated to the 10-year period between the two colonoscopies covered by the health insurance). “Therefore, the simple laboratory tests for occult blood in the stool are still important in order to reach those who do not wish to receive a colonoscopy,“ explains Professor Hermann Brenner, who heads the Division of Clinical Epidemiology and Aging Research at DKFZ.

However, the widely used HaemOccult test which is covered by the health insurances has substantial disadvantages: It is less sensitive and the test result, which is based on enzymatic detection of hemoglobin, can be falsified by the patient’s diet such as red meat or vitamin C supplements. By contrast, immunological detection methods are based on a very specific identification of blood components by antibodies.

In order to compare the accuracy of available tests, Brenner’s team carried out a large-scale study. The epidemiologists screened stool samples of 1,319 individuals before their scheduled regular screening colonoscopy. All samples were tested with the HaemOccult method as well as with six different immunochemical tests. All methods investigated are so-called quick tests whose results can be obtained directly at any doctor’s office. The test results were then compared with the results of the colonoscopies.

The researchers found out that the immunological tests were clearly superior to the HaemOccult screen in the detection of precancerous lesions. Thus, they all identified more than twice the portion of colorectal precancerous lesions. However, the immunological tests varied widely; some of the tests yielded too many “false positives”. Most suitable for early detection are those tests that have a high detection rate and, at the same time, reliably give the all-clear if results are unsuspicious.

“Considering the prevalence of colon cancer, consistent screening might contribute substantially to cancer prevention,“ Herrmann Brenner says. “Despite the availability of colonoscopy free of charge, testing for occult blood still plays an important role, also, for

example, in countries that lack the resources to offer colonoscopy to everybody. Therefore it is vital that the best available tests be used in order to improve the accuracy of stool screens. From a scientific point of view, it would be desirable for health insurances to cover the immunological tests, even though they are slightly more expensive than the common enzymatic test."

Sabrina Hundt, Ulrike Haug, Hermann Brenner: Comparative evaluation of immunochemical fecal occult blood tests for colorectal adenoma detection. Annals of Internal Medicine, Vol. 150, page 163, 3 February 2009

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