Vaccine to prevent colon cancer being tested in patients

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Researchers at the University of Pittsburgh School of Medicine have begun testing a vaccine that might be able to prevent colon cancer in people at high risk for developing the disease. If shown to be effective, it might spare patients the risk and inconvenience of repeated invasive surveillance tests, such as colonoscopy, that are now necessary to spot and remove precancerous polyps.

Colon cancer takes years to develop and typically starts with a polyp, which is a benign but abnormal growth in the intestinal lining, explained principal investigator Robert E. Schoen, M.D., M.P.H., professor of medicine and epidemiology at the University of Pittsburgh. Polyps that could become cancerous are called adenomas.

In a novel approach for cancer prevention, the Pitt vaccine is directed against an abnormal variant of a self-made cell protein called MUC1, which is altered and produced in excess in advanced adenomas and cancer. Vaccines currently in use to prevent cancer work via a different mechanism, specifically by blocking infection with viruses that are linked with cancer. For example, Gardasil protects against human papilloma virus associated with cervical cancer and hepatitis B vaccine protects against liver cancer.

"By stimulating an immune response against the MUC1 protein in these precancerous growths, we may be able to draw the immune system's fire to attack and destroy the abnormal cells," Dr. Schoen said. "That might not only prevent progression to cancer, but even polyp recurrence."

According to co-investigator Olivera Finn, Ph.D., professor and chair of the Department of Immunology at Pitt's School of Medicine, MUC1 vaccines have been tested for safety and immunogenicity in patients with late-stage colon cancer and pancreatic cancer.

"Patients were able to generate an immune response despite their cancer-weakened immune systems," she noted. "Patients with advanced adenomas are otherwise healthy and so they would be expected to generate a stronger immune response. That may be able to stop precancerous lesions from transforming into malignant tumors."

About a dozen people have received the experimental vaccine so far, and the researchers intend to enroll another 50 or so into the study. Participants must be between 40 and 70 years old and have a history of developing adenomas that are deemed advanced, meaning they are greater than or equal to 1 centimeter in size, are typed as villous or tubulovillous, or contain severely dysplastic, or abnormal, cells. After an initial dose of vaccine, the participants will get shots again two and 10 weeks later. Blood samples will be drawn to measure immune response at those time points as well as 12 weeks, 28 weeks and one year later.

People who develop advanced adenomas undergo regular surveillance with colonoscopy so that recurrent polyps, which are common, can be removed before matters get worse, Dr. Schoen said.

"Immunotherapy might be a good alternative to colonoscopy because it is noninvasive and nontoxic," he noted. "And, it could provide long-term protection."

Colorectal cancer is the third leading cause of cancer death in the United States. In 2008, the American Cancer Society estimated that there were more than 108,000 new cases of colon cancer, nearly 41,000 cases of rectal cancer, and almost 50,000 deaths due to both diseases.

Source: University of Pittsburgh Schools of the Health Sciences (news : web)