

Study points to a possible biomarker for colon cancer in people 50 and under

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An abnormality of chromosomes long associated with diseases of aging has, for the first time, been linked to colon cancer in people 50 years old and younger, an age group usually considered young for this disease.

The finding may provide an early alert for younger patients with colon cancer and could prompt new research into colon cancer prevention and treatment strategies, say Mayo Clinic researchers.

The study results will be presented at 10 a.m., Saturday, Oct. 27, during the annual meeting of the American Society of Human Genetics in San Diego.

The Mayo Clinic team led by Lisa Boardman, M.D., a specialist in gastrointestinal malignancies, investigated the structures inside of cells known as telomeres, which are the caps on the ends of chromosomes that keep chromosomes from unraveling. Telomeres naturally shorten with aging and are associated with many diseases of aging, including cancer. Shortened telomeres have been found in colon cancer tumor cells, but this study links these telomeres to colon cancer.

Dr. Boardman and an interdisciplinary group of researchers examined the DNA in blood samples of 114 colon cancer patients 50 years old and younger and 98 people with no history of cancer. They found that the colon cancer patients had abnormal telomeres that were unusually short, particularly for a group of patients considered young for colon cancer: patients in the study were about 15 years younger than the average age of patients with colon cancer. In addition, colon cancer in this younger group affected men more often than women.

Colon cancer, also called colorectal cancer or bowel cancer, includes cancerous growths in the colon, rectum and appendix. It's the second leading cause of cancer death in the United States,

affecting nearly 145,000 people each year. The first cases tend to appear in people in their 40s, but most patients tend to be in their mid 60s by the time they are diagnosed.

Each year about 25,000 people 50 years old or younger are diagnosed with colon cancer, accounting for up to 17 percent of all cases which could potentially be affected by the outcomes of this study. Colon cancer is among the top 10 cancers to affect people between 20 to 49 years old, the authors report.

Unfortunately, young people diagnosed with colon cancer are more likely to be in the later stage of the disease. This group also is more likely to develop rectal cancer as compared to older patients. This information led researchers to suspect that colon cancer in younger people is biologically distinct from colon cancer in older patients.

To researchers, this association between cancer and prematurely short telomeres raises the possibility of one day using telomere length as a biomarker of cancer or an early warning system that can alert physicians to pre-symptomatic cancerous changes that are underway.

"Finding this association between colon cancer patients and increased telomere shortening is exciting because, if validated, it really opens up new possibilities for new treatment strategies. For example, we know that telomere length can be repaired, so we want to look at telomere maintenance genes which, when defective, might very well contribute to cancer," she said.

Researchers intend to look at other associations that shorten telomere length. These include environmental factors, such as increased body mass index and smoking.

"We know that cancer is a disease of the environment and genes, both of which affect

telomeres. If we can understand how this happens, it could lead us to develop therapies to reverse premature telomere shortening, stall it or protect the telomeres from destructive influences in the first place," Dr. Boardman says.

Source: Mayo Clinic

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