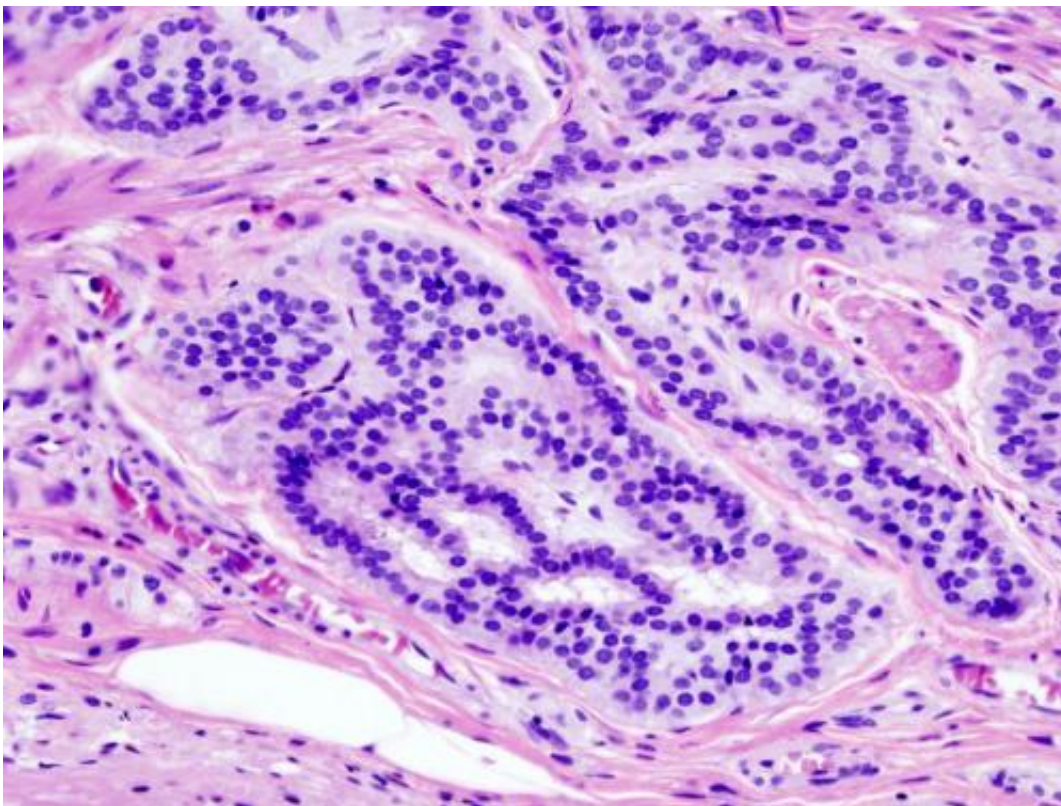


Research suggests metabolite differences in young-onset versus average-onset colorectal cancer

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Cancer—Histopathologic image of colonic carcinoid. Credit: Wikipedia/CC BY-SA 3.0

New research from Cleveland Clinic supports the theory that environmental exposures—such as red meat consumption and sugar

intake—may play a role in the rising incidence of young-onset colorectal cancer.

Researchers found that people younger than age 50 with [colorectal cancer](#) had lower levels of citrate, which is created in the process of converting food into energy, compared to [older people](#) diagnosed with colorectal cancer.

The study also showed key differences in protein and carbohydrate metabolism that could suggest that [red meat consumption](#) and [sugar intake](#) are potential factors for causing colorectal cancer at a younger age.

Cleveland Clinic researchers [shared study results](#) in a presentation at the American Society of Clinical Oncology (ASCO) annual meeting June 3, 2023.

"The number of younger people diagnosed with colorectal cancer has skyrocketed in the last 20 to 30 years," said Suneel Kamath, M.D., gastrointestinal oncologist at Cleveland Clinic and senior author of this research. "There hasn't been a clear explanation for why this has been happening, although we suspected the increase could be attributed to [environmental factors](#), since most cases are not genetic or hereditary—even in [younger people](#). We now have data to support that theory and lead to further investigation."

The analysis of small molecule metabolites, such as citrate, is referred to as metabolomics. This can provide insight into how the body interacts with the environment—essentially a bridge between one's genetics and exposures. Cleveland Clinic researchers used metabolomics to assess differences between young-onset colorectal cancer and average-onset colorectal cancer (disease in patients older than age 60) which they believe could suggest any exposure risks.

The research team identified patients with stage I-IV colorectal cancer from Cleveland Clinic BioRepository samples and categorized patients based on age younger than 50 years or older than 60 years.

The study population comprised 170 colorectal cancer patients (66 young-onset colorectal cancer patients and 104 average-onset colorectal cancer patients). Association analyses revealed multiple differentially abundant metabolites, including citrate and cholesterol. Metabolic pathways significantly altered in young-onset colorectal cancer vs. average-onset colorectal cancer included [carbohydrate metabolism](#) and protein metabolism. The results suggest that energy excess from [sugar-sweetened beverages](#), red meat consumption and obesity may be risk factors for young-onset colorectal cancer.

The study found that higher levels of 4-hydroxyhippuric acid correlated with improved survival in both young and average onset colorectal cancer. While the exact significance of this finding needs to be studied further, 4-hydroxyhippuric acid is known to come from plant-based sources like vegetables, nuts and teas and has antioxidant properties that are known to correlate with better cancer outcomes.

"Metabolomic differences in pathways altered by environmental exposures such as excess red meat consumption may suggest relationships with younger age of onset," said Dr. Kamath. "Next steps would include future studies to understand disease cause and development, and to create biomarkers for better therapies in young-onset colorectal cancer."

More information: Metabolomic differences in young-onset versus average-onset colorectal adenocarcinoma, meetings.asco.org/abstracts-presentations/222545

Provided by Cleveland Clinic

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