Expression patterns of microRNAs appear altered in colon cancer, and associated with poor outcomes

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Preliminary research has found an association between certain microRNA expression patterns and poor survival and treatment outcomes for colon cancer, according to a study in the January 30 issue of JAMA.

Colon cancer is a major cause of cancer death worldwide. Colorectal cancer is the third most common and second leading cause of cancer death in the United States. “Even though 5-year mortality rates have modestly declined over the last 3 decades, there is still a need to identify new prognostic biomarkers and therapeutic targets for this disease,” the authors write. They add that microRNAs have potential as diagnostic biomarkers and therapeutic targets in cancer.

MicroRNAs are 18 to 25 nucleotide, noncoding RNA (ribonucleic acid) molecules that have been found to regulate a variety of cellular processes and may also have a role in the development of cancer cells. The prognostic potential of microRNAs has been demonstrated for chronic lymphocytic leukemia, lung cancer and pancreatic cancer, according to background information in the article. No study has evaluated the association between microRNA expression patterns and colon cancer prognosis or therapeutic outcomes.

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and colleagues evaluated microRNA profiles of colon tumors and paired nontumorous tissue to study their potential role in tumor formation, diagnosis and therapeutic outcome in colon cancer. The study included 84 patients from Maryland; associations were validated in a second, independent group of 113 patients from Hong Kong.

Thirty-seven microRNAs were differentially expressed in tumor tissues by microRNA microarray analysis in the Maryland test cohort. Expression patterns of five tested microRNAs were validated in the Hong Kong cohort. “The discriminatory power of 5 microRNAs to differentiate between tumor and nontumorous tissue suggests that predictable and systematic changes of microRNA expression patterns may occur during tumorigenesis and may be representative of sporadic colon adenocarcinomas,” the authors write.

“… we found systematic differences in microRNA expression patterns between colon tumors and paired nontumorous tissue. Tumors with high expression of miR-21 [a microRNA] was associated with poor survival outcome and poor response to adjuvant chemotherapy in 2 independent cohorts, independent of staging and other clinical covariates suggesting that miR-21 may be a useful diagnostic biomarker for colon adenocarcinomas and survival prognosis including response to therapy.”

“Additional studies are required to demonstrate a causal link with miR-21 and the progression of colon cancer to determine the potential of miR-21 as either a biomarker or therapeutic target,” the researchers write.

Source: JAMA and Archives Journals