

Is your hemoglobin 'trending'?

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Anemia, a common blood disorder characterized by low hemoglobin levels, has long been associated with those suffering from colorectal cancer. But researchers at Tel Aviv University have discovered that, more than a symptom of active disease, low hemoglobin levels can actually indicate a potential for colon cancer years before it's diagnosed.

Graduate student Inbal Goldshtein, who works with Dr. Gabriel Chodick and Dr. Varda Shalev of Tel Aviv University's School of Public Health and Maccabi Healthcare Services' Department of [Medical Informatics](#), says that paying close attention to routine blood test results can be an effective screening system for colon cancer which, when diagnosed early enough, can be treated effectively. More than 50,000 people in the U.S. will die from colon cancer in 2010. Better screening could significantly reduce those numbers, Goldshtein says.

The study, recently published in the *European Journal of [Cancer Prevention](#)*, shows that most patients with colon cancer have a history of consistently declining hemoglobin levels up to four years before being diagnosed with the disease. Previously, says Goldshtein, researchers only looked for a sharp decrease in hemoglobin levels as a symptom of [colon cancer](#). But Goldshtein and her fellow researchers have discovered that it's the continuous long-term decline that may announce the onset of cancer. A declining trend of more than 0.28 grams per decilitre every six months over a four-year period was observed and may serve as a warning of illness on the horizon.

An important downward trend

Taking into account the correlation between anemia and colorectal cancer, the team was keen to discover if a decline in hemoglobin levels could be detected prior to the critical stages of the disease — something no researcher had yet attempted to quantify. Over 3,000 patients suffering from colorectal cancer participated in the study; they were compared with 10,000 control cases without colorectal cancer. Goldshtein and her fellow researchers looked at data from each participant's blood tests over a ten-year period, retrieved from the computerized database of Maccabi Healthcare Services.

Though hemoglobin levels may vary in every human being as a result of aging, a distinct trend was discovered among study participants who had been diagnosed with colorectal cancer during the study period. Approximately four years prior to their diagnoses, their blood tests began to show a continuous decline in hemoglobin levels.

For the most part, says Goldshtein, these warning signs went unnoticed. "In practice, a doctor will look at the final results, and see if the hemoglobin levels are within a normal range," she explains. "But this is not accurate enough. It is important to look at the continuing trend of each individual. If a person experiences a consistent decline relative to his own average level, it may be cause for concern."

Participants of the study with colorectal cancer experienced a sharp decline in hemoglobin levels, but because the declines did not put them outside the normal range, no red flags were raised.

A new algorithm for the average physical

The benefit of this screening process is that can be part of an average physical. Current testing for colorectal cancer is often expensive and unpleasant. There is also a very low compliance rate among patients, she

adds.

The next step, says Dr. Shalev, is to create an algorithm which will automatically detect suspicious declines in hemoglobin levels, advising physicians to send their patients for further testing. Ideally, she notes, the Tel Aviv University team will develop a computer program that will display warnings when there is cause for concern.

Provided by Tel Aviv University

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