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Circulating blood cells are important predictors of cancer spread in children

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Endothelial progenitor cells may play a role in the start and progression of metastatic disease in children with cancer, according to study results published in *Clinical Cancer Research*, a journal of the American Association for Cancer Research.

"This is the first study to measure circulating endothelial cells and endothelial progenitor cells in children with cancer, which can provide insight as to the biology of their tumor vessels," said researcher Françoise Farace, Ph.D., director of the department of biology of circulating cells in the translational research laboratory, Institut Gustave Roussy, France.

"Not only were these cells found in higher levels in patients compared to healthy volunteers, but endothelial progenitor cells were found in strikingly higher amounts in patients with metastatic disease," Farace said.

Circulating endothelial cells are rare cells that shed from the lining of blood vessels after vascular damage. Both circulating endothelial cells and their precursors, endothelial progenitor cells, have been described in previous studies, but mainly in the context of cardiovascular disease.

Farace and colleagues measured circulating mature endothelial cells and bone marrow-derived endothelial progenitor cells in pediatric patients with solid tumors. They collected blood from 23 patients with localized disease, 22 patients with metastatic disease and 20 healthy participants

and measured subsets of circulating cells.

While the researchers were not surprised to detect circulating endothelial cells and endothelial progenitor cells in pediatric patients, they were surprised to find these cell levels were significantly higher in patients with metastatic disease compared to levels found in healthy participants.

"This implies that these endothelial cells most likely play a role in the development of cancer in children," Farace said. "We also observed a large range of cell levels in patients with various tumor types. In some cases, very high levels were observed, which means that their role may be very important."

Preclinical studies have shown that these cells play a pivotal role in the initiation of metastasis or the spread of disease in mice; however, their association with metastatic spread has never been demonstrated in humans until now.

"Understanding the process of tumor vessel development in pediatric cancers is of utmost importance as pediatric patients are in dire need of new treatment strategies including those which could target tumor vessels," said researcher Melissa Taylor, M.D., pediatrician and doctoral student in the translational research laboratory, Institut Gustave Roussy, France.

Additional studies are needed in larger study populations to confirm that endothelial progenitor cells are implicated in metastasis. If confirmed, these cells could potentially be measured in patients to allow for early detection of metastatic disease and could be targeted by new drugs to prevent the spread of cancer, according to the researchers.

"This study is very interesting. It demonstrated that these rare cells detected in the blood of adult cancer patients are also important in

pediatric cancers," said James L. Abbruzzese, M.D., F.A.C.P., chairman of the department of gastrointestinal medical oncology, M.G. and Lillie A. Johnson chair for cancer treatment and research and professor of medicine at the University of Texas M. D. Anderson Cancer Center. He is also a deputy editor of *Clinical Cancer Research*.

One challenge with this study Abbruzzese pointed out is defining the characteristics of these cells, which may be more difficult to accomplish in a pediatric population because drawing a large volume of blood is not an easy task.

"Understanding these vascular precursor cells and seeing the changes over time may represent a real strategy for helping to identify drugs that might work in the pediatric population," he said. "Insights as to which patients are likely to develop metastases may help us to identify a subset of patients that require more extensive therapy."

Taylor believes these study results may potentially open new research strategies, which may take into account the study of circulating endothelial cells and progenitor cells in pediatric patients.

"Monitoring of these cells in larger and more homogenous study populations will help us understand the biology of tumor vessels and subsequently tumor growth in these diseases," she said.

Source: American Association for Cancer Research (news : web)

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