

Chromosomes tell tale of patient's risk for new, future cancer

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Hodgkin's disease survivors who have greater genetic instability in their white blood cells are two-and-a-half times more likely to develop another type of cancer, researchers from The University of Texas M. D. Anderson Cancer Center report at the American Association for Cancer Research annual meeting in Los Angeles April 14-18.

Chromosomal aberrations analyzed by the researchers could potentially be used as a biomarker to predict a person's risk of developing a second primary tumor, both for Hodgkin's disease patients and for those with other types of cancer, says principal investigator Randa El-Zein, Ph.D., associate professor in M. D. Anderson's Department of Epidemiology.

"Hodgkin's disease is a highly treatable cancer of the lymphatic system and many patients do very well. Yet we know that some patients are at risk of developing another type of cancer later on - solid tumors, leukemia or melanoma, for example - and we cannot identify those patients in advance now," El-Zein says.

"We can use this measure of genetic instability to identify patients at high risk and counsel them to continue regular screening for breast, colon and other cancers even after their Hodgkin's disease has disappeared," El-Zein says. "We also can emphasize that they should especially avoid tobacco use or exposure to environmental toxins at work and eat a healthy diet. You're at risk, don't do anything to make it worse."

The research team looked at 252 adults treated for Hodgkin's disease at M. D. Anderson between 1986 and 1992. The patients had cytogenetic analysis - a close look at the chromosomes in their lymphocytes - done before treatment began and periodically throughout their care.

"We found that people with a higher level of chromosomal aberrations are the ones who developed a second primary tumor," El-Zein notes. The team measured chromosomal breaks per 100 cells and found patients who developed a second primary cancer had 5.91 breaks per 100 cells while those who did not develop a second tumor had 3.97 breaks per 100.

Over a median follow-up period of 13 years, 27 of the patients developed second cancers: five solid tumors, four leukemias, 11 skin cancers and seven lymphomas. Those with higher chromosomal breaks were 2.48 to 2.78 times more likely to develop cancer anew.

Chromosomal breaks occur when both chromosome arms are truncated. Chromatid breaks are those when only one chromosome arm is shortened, yet these appear to be the more predictive type of break, the researchers found.

"Whatever can be applied to Hodgkin's can be applied to other cancers," El-Zein said, so chromosomal screening has potentially broad application for gauging second primary cancer risk across types of cancer. The team is also analyzing chromosomal breaks for correlations to a patient's response to treatment.

El-Zein presented an abstract of the group's research at the AACR annual meeting and her work was highlighted by the research group in a news conference today.

Source: University of Texas M. D. Anderson Cancer Center

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