MedicalXpress

Study finds genomic differences in types of cervical cancer

August 23 2013

A new study has revealed marked differences in the genomic terrain of the two most common types of cervical cancer, suggesting that patients might benefit from therapies geared to each type's molecular idiosyncrasies.

The study, published August 23, 2013 in the online version of the journal *Cancer* by researchers at Dana-Farber Cancer Institute and Brigham and Women's Hospital (BWH), is the first to compare the spectrum of cancer-related gene mutations in the two main subtypes of cervical cancer – adenocarcinoma and squamous cell carcinoma. In tests on 80 cervical tumor samples, the investigators found high rates of mutations in two genes: PIK3CA and KRAS. While PIK3CA mutations appeared in both subtypes, KRAS mutations were found only in adenocarcinomas.

By linking their findings to data on patients' treatment and survival, researchers found that PIK3CA mutations are associated with a shorter survival period: patients whose tumors carried these mutations lived a median of 67 months after diagnosis compared with 90 months for patients whose tumors lacked the mutations.

"We have historically treated cervical cancers as one disease," says the study's lead author, Alexi Wright, MD, MPH, of the Susan F. Smith Center for Women's Cancers at Dana-Farber. "However, our findings suggest that some patients may be at higher risk of dying from their disease and might benefit from a more tailored treatment approach."

The discovery of high rates of PIK3CA mutations in the cervical tumor samples suggests that many patients could benefit from drugs known as PI3-kinase inhibitors, which target the family of proteins associated with the gene, the authors say. Patients with the adenocarcinoma subtype of cervical cancer may benefit from targeted agents known as MEK inhibitors, which have shown some success in clinical trials.

Cervical cancer is the second leading cause of cancer deaths among women worldwide, responsible for 275,000 deaths annually. While Pap tests have helped decrease the incidence of squamous cell cervical cancer, adenocarcinomas now account for nearly a quarter of all cervical cancers, up from 5 percent 20 years ago.

In the study, investigators probed the DNA of 80 cervical cancer tumors – 40 adenocarcinomas and 40 squamous cell carcinomas – for 1,200 mutations in hundreds of genes linked to cancer. The probe was done with OncoMap, a system developed at Dana-Farber to test large numbers of tumor samples for cancer-related genes. They found that 31 percent of the samples had PIK3CA mutations; 17.5 percent of the adenocarcinomas (and none of the squamous cell carcinomas) had KRAS mutations; and 7.5 percent of the squamous cell carcinomas (but none of the adenocarcinomas) had a rare mutation in the gene EGFR.

"While current treatment strategies don't take into account whether cervical tumors are adenocarcinomas or squamous cell carcinomas, our study suggests that identifying and targeting distinct subsets of patients may improve outcomes for women with early or late-stage disease," Wright comments.

More information: onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291097-0142

Provided by Dana-Farber Cancer Institute