Medical Xpress

Identifying lung cancer gene markers shows promise in identifying patients needing chemo

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Cancer researchers have identified six gene markers present in early stage non-small cell lung cancer (NSCLC) that show promise in helping oncologists better identify which tumors will relapse after curative surgery, according to a study presented at the 2010 Chicago Multidisciplinary Symposium in Thoracic Oncology. This symposium is sponsored by the American Society for Radiation Oncology (ASTRO), the American Society of Clinical Oncology (ASCO), the International Association for the Study of Lung Cancer (ISLAC) and the University of Chicago.

Lung cancer is the leading cause of cancer deaths in the United States with about 170,000 new cases diagnosed annually. NSCLC accounts for 85 percent of lung cancer cases and has a five-year survival rate of only 15 percent. The standard of care for patients with stage II/IIIA disease is surgery plus chemotherapy. However, chemotherapy is not routinely offered to patients with stage I disease even though 30 percent or more will experience a relapse within five years. Doctors have been trying to identify ways to determine which of these stage I patients will relapse and thus may benefit from more aggressive treatment.

Lance Miller, Ph.D., and Jimmy Ruiz, M.D., at Wake Forest University School of Medicine, focus on NSCLC at the molecular level using a genomic tool referred to as a DNA microarray to study how genes are turned on and off in tumors. Using computational and statistical

methods, they sift through the "gene profiles" of many tumors for molecular clues that may explain the different clinical behaviors of NSCLC. Recently, Dr. Miller and Dr. Ruiz studied, in combination, the gene profiles of hundreds of stage I non-small cell lung tumors obtained from various medical institutions around the world. They discovered a six-gene prognostic classifier that stratified patients into low-, intermediate- and high-risk groups with significantly different relapse rates.

The six-gene, stage I NSCLC classifier (aka, the "S1N" classifier) was then validated in a 179-patient test cohort not involved in the gene discovery process. While the predicted low- and intermediate-risk cases showed similar survival rates, the high-risk, "poor outcome" group showed strong agreement with the training cohort with a five-year relapse rate of greater than 80 percent. From this, investigators were able to conclude that surgery followed by observation is not sufficient treatment for these high-risk stage I patients, who comprised approximately one-third of the patient population.

"The goal of the project was to develop a personalized approach to the selection of patients with early stage lung cancer for whom more aggressive therapy may provide a survival benefit," Dr. Ruiz, lead author of the study and fellow of hematology and oncology at Wake Forest University School of Medicine, said. "While the S1N classifier still requires prospective validation, we believe it identifies a substantial fraction of high-risk stage I patients for whom chemotherapy or investigational treatments should be considered."

Provided by American Society for Radiation Oncology