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Study points to possibility of blood test to detect lung cancer

DURHAM, N.C. -- A test for four blood proteins may provide a less-invasive follow-up for patients who have suspicious lesions on chest radiographs or computerized tomography (CT) scans, according to a new study led by Duke University Medical Center researchers.

CT scans have a very high false positive rate when trying to discover lung cancer," said Edward Patz, Jr., M.D., a radiologist at Duke and lead investigator on the study. That that leads to is several follow-up imaging studies or invasive procedures like biopsy, which have risks of their own. This study is the first step in developing a test that would allow us to sample a patient's blood and determine whether more invasive testing and treatment are necessary.

The researchers published their findings in the December 10, 2007 issue of the Journal of Clinical Oncology. The study was funded by Duke's Department of Radiology.

Researchers studied four proteins in the blood and found that their levels were different in patients with lung cancer as compared to patients of the same age and gender who didn't have cancer. They compared the levels of these proteins in the blood of almost 100 patients known to have lung cancer to the levels in the blood of nearly 100 patients without cancer.

Using the four markers, known as CEA, RBP, SCC and AAT, we were able to distinguish patients who had cancer from those who didn't with over 80 percent accuracy," Patz said.

The four protein markers have all been associated with lung cancer, but none in isolation wields enough influence to definitively indicate the disease. However, in combination they may be very useful, Patz said.

The researchers created a "classification tree" to sort out a person's likelihood of having lung cancer, based on the levels of each of the four proteins. People whose samples landed in one of

three bins at the bottom of the tree had a 90 percent chance of having cancer, Patz said. Other bins indicated risks as low as 10 percent.

CT scanning has been proposed for routine lung cancer screening, but it detects many nodules that are not cancerous, leading to more invasive and risky treatment. A recent study found that nodules were detected in more than 70 percent of those screened, while lung cancer was found in less than three percent.

We talk about how devastating this disease is all the time, but we still don't have a screening system in place that can detect lung cancer early, without exposing patients to the risks of biopsy and surgery," Patz said. This study is an important step in the right direction.

The researchers will next perform a larger study looking at the use of biomarkers prospectively in patients found to have lung lesions by CT scan. The ultimate goal is to develop a screening system by which patients could have the blood test before imaging and those found to be in a high risk bin would have a CT scan for further evaluation.

We would determine whether the person is at low or high risk of having lung cancer based on these biomarkers, Patz said. Patients at low risk might be followed with further blood tests or imaging studies while those at high risk might require immediate intervention.

Lung cancer is the leading killer of men and women in the United States, with nearly 175,000 people diagnosed each year, and about 160,000 patients dying from the disease yearly. More than 75 percent of lung cancer patients have already experienced significant disease spread by the time they are diagnosed, making the need for early detection techniques imperative.

Other researchers involved with this study were Michael Campa, Elizabeth Gottlin, Irina Kusmartseva, Xiang Rong Guan and James Herndon.