MedicalXpress

Blood proteins predict survival in idiopathic pulmonary fibrosis: study

October 25 2011

A panel of blood proteins can predict which patients with the progressive lung disease idiopathic pulmonary fibrosis (IPF) are likely to live at least five years or to die within two years, say researchers at the University of Pittsburgh School of Medicine and Centocor R&D. The findings, published online last week in the *American Journal of Respiratory and Critical Care Medicine*, could help doctors determine those patients in imminent need of a lung transplant and those who can wait a while longer.

Fifty percent of IPF patients die within three years of diagnosis, but others will do well for long periods of time, explained investigator Naftali Kaminski, M.D., professor of medicine, pathology, human genetics and computational biology, Pitt School of Medicine, and director, The Dorothy P. & Richard P. Simmons Center for Interstitial Lung Disease at UPMC. In the disease, breathing becomes increasingly impaired as the lungs progressively scar.

"It's hard to tell based on symptoms alone which patients are in the greatest danger," Dr. Kaminski said. "This biomarker panel has predictive power that can guide our treatment plan. It may also help us design more effective research trials because we'll be able to better match experimental therapies with the most appropriate patients."

The research team collected blood samples from 241 IPF patients. They measured the levels of 92 candidate proteins in 140 patients and found that higher concentrations of five particular proteins that are produced

by the breakdown of lung tissue predicted poor survival, transplant-free survival and progression-free survival regardless of age, sex and baseline pulmonary function. They then confirmed the results in a second group of 101 patients.

Based on both groups, the investigators developed the personal clinical and molecular mortality prediction index (PCMI) that incorporates the gender, lung functions and levels of one of the proteins, called MMP7, in the blood. Patients with a low PCMI were more likely to live more than 5 years while the median survival for patients with high PCMI scores was 1.5 years.

"This indicates that these blood biomarker levels are not just a reflection of current severity of the lung disease, but they are predictive of impending death," said lead author Thomas Richards, Ph.D., assistant professor of medicine and head of the Simmons Center biostatistics team.

"They have the potential to greatly improve our treatment strategies for IPF, in part by showing us which patients have the most urgent need for lung transplant, which is currently the only cure for the disease," added senior author Kevin Gibson, M.D., medical director of the Simmons Center.

"These findings provide proof of the concept of personalized medicine. " noted Mark T. Gladwin, M.D., chief, Division of Pulmonary, Allergy and Critical Care Medicine, University of Pittsburgh School of Medicine. "We can use a combination of biological and clinical markers to determine the very best care for each patient.

Drs. Kaminski, Gibson and colleagues have research projects underway to better understand how the biomarkers change over time.

The team includes Kathleen O. Lindell, Ph.D., R.N., and others at the Simmons Center and Pitt School of Medicine, as well as researchers from Centocor R & D in Radnor, Pa.

Study results will be presented by Dr. Kaminski at the IPF session of the Pittsburgh International Lung Conference on Personalized Medicine of Lung Disease at 2:30 p.m. on October 28 and 29 at the Holiday Inn Pittsburgh University Center.

Provided by University of Pittsburgh