

# Inflammatory biomarkers improve the clinical prediction of mortality in COPD

March 16 2012

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The addition of changes in inflammatory biomarkers to established clinical variables improves the prediction of mortality in patients with chronic obstructive pulmonary disease (COPD), according to a new study.

"COPD is characterized by low-grade inflammation, so we hypothesized that the addition of inflammatory biomarkers to established predictive factors would improve the prediction of mortality," said lead author Bartolome Celli, lecturer in medicine at Harvard Medical School and member of the Pulmonary and Critical Care Division of Brigham and Women's Hospital in Boston. "We found that the addition of a panel of selected biomarkers to clinical variables significantly improved the ability of clinical variables to predict mortality in these patients."

The findings were published online ahead of print publication in the American Thoracic Society's *American Journal of Respiratory and Critical Care Medicine*.

The researchers analyzed prospectively collected data on 1,843 COPD patients from the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) study. Of these 1,843 patients, 168 (9.1%) died during the three-year follow-up.

Clinical predictors of mortality included age, BODE (Body-Mass Index, [Airflow Obstruction](#), Dyspnea, and Exercise Capacity) index, and incidence of hospitalizations due to exacerbations of COPD in the year

prior to the study. A predictive model for mortality using these clinical variables had a C-statistic (which measures the ability of how well a clinical prediction rule can correctly rank-order patients by risk) of 0.686. Adding interleukin-6 (IL-6) to the predictive model significantly improved the C-statistic to 0.708, and the addition of a panel of biomarkers including white blood cell counts, IL-6, C-reactive protein (CRP), interleukin-8 (IL-8), fibrinogen, chemokine (C-C-motif) ligand 18 (CCL-18), and surfactant protein D (SP-D) further improved the C-statistic to 0.726.

"This panel of selected biomarkers was not only elevated in non-survivors in our cohort, but was associated with mortality over three years of follow-up after adjusting for clinical variables known to predict mortality in patients with COPD," said Dr. Celli. "Except for IL-6, these biomarkers improved the predictive value of our model only marginally when considered individually, but they improved the model significantly when analyzed as a group."

The study had several limitations, including the lack of a study adjudication committee to specify causes of death, the exclusion of some biomarkers thought to be important in the pathobiology of COPD, and the lack of a validating cohort.

"Adding white blood cell counts and measurement of changes in systemic levels of IL-6, CRP, IL-8, fibrinogen, CCL-18, and SP-D significantly improves the ability of clinical variables to predict mortality in patients with COPD," said Dr. Celli. "This is the first study to show that the addition of biomarker levels to clinical predictors in COPD [patients](#) adds relevant prognostic information."

Provided by American Thoracic Society

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