Severity of emphysema predicts mortality

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Severity of emphysema, as measured by computed tomography (CT), is a strong independent predictor of all-cause, cardiovascular, and respiratory mortality in ever-smokers with or without chronic obstructive pulmonary disease (COPD), according to a study from researchers in Norway. In patients with severe emphysema, airway wall thickness is also associated with mortality from respiratory causes.

"Ours is the first study to examine the relationship between degree of emphysema and mortality in a community-based sample and between airway wall thickness and mortality," said lead author Ane Johannessen, PhD, post-doctoral researcher at Haukeland University Hospital in Bergen, Norway. "Given the wide use of chest CT scans around the world, the predictive value of these measures on mortality risk is of substantial clinical importance."

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

The study included a community-based cohort of 947 ever-smokers with and without COPD who were followed for eight years. All subjects underwent spirometry and CT scanning. Degree of emphysema was categorized as low, medium, or high based on the percent of low attenuation areas (areas with lower density than normal) on CT. COPD was diagnosed by spirometric measurement of airway obstruction. Of the 947 patients, 462 had COPD.

During follow-up, four percent of the 568 subjects with a low degree of emphysema died, compared with 18 percent of the 190 patients with a medium degree of emphysema and 44 percent of the 189 patients with a high degree of emphysema.

After adjustment for sex, COPD status, age, body mass index, smoking and measures of lung function, survival in the low emphysema group was 19 months longer than survival in the middle and high emphysema groups for all-cause mortality. Compared with subjects in the low emphysema group, subjects with a high degree of emphysema had 33 months shorter survival for respiratory mortality and 37 months shorter survival for cardiovascular mortality.

Emphysema was a significant predictor of all cause-specific mortalities, with increasing emphysema levels predicting shorter survival. While airway wall thickness was not an independent predictor of mortality, increased airway wall thickness reduced survival time in patients with more severe emphysema.

"The relationship between emphysema levels and mortality we found can be used in the risk assessment of these patients," concluded Dr. Johannessen. "Accurately predicting mortality risk may help target patients for specific therapeutic interventions which may improve outcomes."

Provided by American Thoracic Society