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Session: A53 Respiratory Failure: Risk Factors and Outcomes in ARDS

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Location: Area E, Hall D (North Building, Lower Level), MOSCONE CENTER

Risk of Mortality Linked to Interstitial Lung Abnormalities

ATS 2016, SAN FRANCISCO — New research uncovering a link between Interstitial Lung Abnormalities (ILA) and an increased risk of in-hospital mortality was shared at the ATS 2016 International Conference.

“While ILA have been associated with physiologic abnormalities, the association between ILA and mortality had not been previously investigated,” said R.K. Putman, MD, Clinical Fellow in Medicine, Beth Israel Deaconess Medical Center. “We wanted to determine whether the presence of ILA on prior chest CT imaging was associated with acute respiratory distress (ARDS) in a cohort of patients from the Registry of Critical Illness (RoCI) at Brigham and Women’s Hospital (BWH)”

Researchers performed a retrospective case-control study of 55 patients with ARDS from the RoCI at BWH, as well as chest CT imaging taken at least 7 days prior to the onset of ARDS. Prior CT imaging for 53 age-matched, non-ARDS controls were also examined.

Pre-ARDS chest CT scans were evaluated for ILA by readers blinded to clinical data; multivariable logistic regression models were used to evaluate the association between ILA and ARDS, as well as ILA and in-hospital mortality.

In patients with ARDS, ILA were present in 20 (36 percent), 22 (40 percent) were indeterminate for ILA, and 13 (24 percent) had no ILA. Among patients without ARDS, 6 (11 percent) had ILA, 26 (49 percent) were indeterminate for ILA and 21 (40 percent) had no ILA. After adjustment for important covariates (age, APACHE score, smoking history), the presence of ILA were positively associated with ARDS. Additionally, ILA was also found to be associated with in-hospital mortality.

“We found that in those critically ill patients with prior chest CT imaging, patients with ARDS were more likely to have ILA, and those with ILA on CT imaging prior to the development of ARDS also had a greater risk of in-hospital mortality,” said Dr. Putnam. “Our findings suggest that cohorts of patients with ARDS may contain patients with undiagnosed interstitial lung disease, and raises the possibility that ILA may, in some cases, be a risk factor for ARDS.”

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Abstract 4042

Rationale: The acute respiratory distress syndrome (ARDS) is a heterogeneous syndrome with multiple etiologies that may have unique pathophysiology. Patients with pulmonary fibrosis frequently develop acute exacerbations with radiologic and pathologic findings that are indistinguishable from ARDS. Recent work suggests that interstitial lung abnormalities (ILA), in some cases, may represent an early or mild stage of pulmonary fibrosis but it is not known if ILA is a risk factor, or could be mistaken, for ARDS.

Objectives: To determine if the presence of ILA on prior chest CT imaging was associated with ARDS in a cohort of patients from the Registry of Critical Illness (RoCI) at Brigham and Women’s Hospital (BWH). Based on these findings to investigate if ILA are associated with an increased risk of in-hospital mortality.

Methods: We performed a retrospective case-control study of 55 patients with ARDS and chest CT imaging at least 7 days prior to the onset of ARDS were identified from the RoCI at BWH and 53 age matched non-ARDS controls with prior chest CT imaging. Pre-ARDS chest CT scans were evaluated for ILA by readers blinded to clinical data. Multivariable logistic regression models were used to evaluate the association between ILA and ARDS and ILA and in hospital mortality.

Measurements and Main Results: In patients with ARDS, ILA were present in 20 (36%), 22 (40%) were indeterminate for ILA and 13 (24%) had no ILA. Among patients without ARDS, 6 (11%) had ILA, 26 (49%) were indeterminate for ILA and 21 (40%) had no ILA. After adjustment for important covariates (age, APACHE score, smoking history), the presence of ILA were positively associated with ARDS [odds ratio (OR) of 2.8, 95% Confidence Interval (CI) 1.3, 5.8, P=0.007]. Additionally, ILA were also associated with in-hospital mortality, [OR=2.5, 95% CI 1.2, 5.1, P=0.02] after adjustment for covariates. ILA remained associated positively associated with ARDS after exclusion of patients with a history of interstitial lung disease [OR=3.6, 95% CI 1.4, 9.0, P=0.007].

Conclusions: In a cohort of critically ill patients with prior chest CT imaging, patients with ARDS were more likely have had ILA. Those with ILA on CT imaging prior to the development of ARDS also had a greater risk of in-hospital mortality. Our findings suggest that cohorts of patients with ARDS may contain patients with undiagnosed interstitial lung disease, and raises the possibility that ILA may, in some cases, be a risk factor for ARDS.

