

New Insights in Acute Respiratory Distress Syndrome

Fifty Years Ago, Ashbaugh and colleagues described for the first time the term adult (later changed to acute) respiratory distress syndrome (ARDS). Since then substantial progress has been made in the care of affected patients and those at risk for the disorder, with reductions in both incidence and mortality. However, ARDS remains a relatively common and lethal or disabling syndrome. In the recent International study of LUNG SAFE involving 29,144 patients, 10% of all patients admitted to the intensive care unit and 23% of mechanically ventilated patients had ARDS. Mortality in the subgroup of patients with severe ARDS was 46%. Patients who survive this disorder are at high risk for cognitive decline, depression, post-traumatic stress disorder, and persistent skeletal-muscle weakness.

ARDS is a syndrome characterized by substantial heterogeneity. A much better understanding of biological and genetic underpinnings of sub-phenotypes of ARDS should lead the way to move targeted therapies. Until then, ICU practices that prevent ARDS, early and effective treatment of the insults leading to ARDS, and long-protective ventilation and sensible fluid management remain the essential elements for good outcomes.

Novel therapeutics have largely failed to translate from promising preclinical findings into improved patients outcomes in late phase clinical trials. Recent advances in personalized medicine, big data, causal inference using observational data, novel clinical trial designs, preclinical disease modelin, and understanding of recovery from acute illness promise to transform the methods of pulmonary and critical care clinical research. The recommendations for future research priorities and directions are : 1) focusing on understanding the clinical, physiological, and biological underpinnings of heterogeneity in ARDS with the goal of developing targeted, personalized interventions; 2) optimizing preclinical models by incorporating comorbidities, cointerventions , and organ support; 3) developing and applying novel clinical trial designs; 4) advancing mechanistic understanding of injury and recovery to develop and test interventions targeted at achieving long-term improvements in the lives of patients and families.

This special issue will review new insights in ARDS by International experts in intensive care and acute respiratory failure.

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