New Era in ARDS: Addressing the Acute Respiratory Distress Syndrome

Acute respiratory distress syndrome (ARDS) is characterized by diffuse alveolar damage, which leads to acute hypoxia and non-cardiogenic pulmonary edema. The original definition of ARDS, proposed by the American-European Consensus Conference (AECC) in 1994, included criteria for acute onset, positive end-expiration pressure (PEEP), and a PaO2/FiO2 ratio. However, more recent definitions have been proposed to improve the predictive validity of the ARDS definition.

The Berlin Definition of ARDS, introduced in 2012 by the European Society of Intensive Care Medicine, was based on a systematic review of observational studies and randomized controlled trials (RCTs). The definition includes acute onset, positive end-expiration pressure (PEEP), a PaO2/FiO2 ratio, and exclusion criteria such as left atrial hypertension. The Berlin definition has a pooled mortality of 44.3% compared to 44.0% in observational studies and 36.2% in RCTs. The odd ratio for mortality was 1.27 (95% CI 1.07-1.50, p = 0.006).

ARDS has been associated with increased mortality, and new strategies have been developed to manage this condition. Ventilator management strategies include lung-protective ventilation strategies, which involve low tidal volumes (< 6 ml/kg predicted body weight) and limited plateau pressures (< 30 cmH2O). Over-distension injury (volutrauma) and barotrauma can be minimized by using recruitment/de-recruitment maneuvers to optimize PEEP and airway pressure-release ventilation (APRV). Oscillatory ventilation (HFOV) has also been used to improve gas exchange. Extracorporeal membrane oxygenation (ECMO) and extracorporeal CO2 removal have been used in severe cases.

The Berlin Definition of ARDS has been widely adopted and is now considered the standard for diagnosing and managing ARDS.
References: