



ARDS beyond the Berlin definition: What else to define the acute respiratory distress syndrome (ARDS)?

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SUMMARY

The acute respiratory distress syndrome (ARDS) is an inflammatory process of the lungs in response to pulmonary and systemic insults to the alveolar-capillary membrane. Clinically, ARDS is characterized by severe hypoxemia, bilateral radiographic pulmonary infiltrates, and no clinical evidence of cardiogenic pulmonary edema. These criteria allow the inclusion of a heterogeneous group of patients. A precise definition is crucial since the effects on outcome of ventilator and adjunctive techniques depend on the degree of lung injury.

In 1994, an American-European Consensus Conference (AECC) redefined ARDS as: (i) acute onset of severe respiratory distress, (ii) bilateral infiltrates on frontal chest radiograph, (iii) absence of clinical signs of left-ventricular failure, and (iv) severe hypoxemia, assessed by $\text{PaO}_2/\text{FiO}_2$ ratio¹. According to these guidelines, ARDS exists when $\text{PaO}_2/\text{FiO}_2$ is ≤ 200 mmHg regardless of positive end-expiratory pressure (PEEP) and FiO_2 levels. The AECC reserved the term acute lung injury (ALI) for patients meeting the same criteria, but with a $\text{PaO}_2/\text{FiO}_2 > 200$ and ≤ 300 mmHg.

In 2012, an update of the AECC definition (the so-called "Berlin definition")² proposed an empirical ARDS classification according to three $\text{PaO}_2/\text{FiO}_2$ cut-off values on $\text{PEEP} \geq 5$ cmH₂O at ARDS onset: severe (≤ 100 mmHg), moderate (>100 - ≤ 200), and mild (>200 - ≤ 300). However, the AECC and the Berlin definitions are essentially identical. The Berlin definition is simply a change of nomenclature where: (i) ALI is renamed mild ARDS, (ii) ARDS is separated into two groups (moderate and severe ARDS), and (iii) the rest of the diagnostic criteria are essentially the same. The addition of 5 cmH₂O of PEEP has no impact on the ARDS definition since it is hard to conceive that an ARDS patient would be managed with a $\text{PEEP} < 5$ cmH₂O.

The Berlin definition failed to provide rules for appropriate assessment of lung injury severity since it does not include standardization of PEEP and FiO_2 levels³, and did not consider the effects of time on the designation of severity. Patients with severe lung injury evolve within 24 h to less or more severe forms of ARDS without any specific drug therapy or novel ventilatory support.

In this European Congress, the CIBERES investigator Jesús Villar will show in his lecture on October 1st 2014 at 12 noon, clinical data demonstrating that the Berlin criteria are no useful for

assessing severity of lung injury and for enrolling appropriate ARDS patients into clinical trials. In addition, he will provide clinically relevant information for universal identification and stratification of ARDS patients at the bedside using an easy-to-measure biomarker⁴.

References

1. Bernard GR et al. The American-European Consensus Conference on ARDS. *Am J Respir Crit Care Med* 1994, 149(3 Pt 1):818-824.
2. Ranieri VM et al. ARDS: The Berlin Definition. *JAMA* 2012, 307:2526-2533.
3. Villar J et al. A universal definition of ARDS. *Intensive Care Med* 2013, 39:583-592.
4. Villar J et al. A clinical classification of the acute respiratory distress syndrome for predicting outcome and guiding medical therapy. *Crit Care Med* 2014 (*in press*).