



## ORIGINAL

# Mortality in patients with respiratory distress syndrome<sup>☆,☆☆</sup>



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### KEYWORDS

Acute respiratory distress syndrome;  
Mortality;  
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Acute respiratory distress syndrome rescue therapy

### Abstract

**Introduction:** Mortality in Acute Respiratory Distress Syndrome (ARDS) is decreasing, although its prognosis after hospital discharge and the prognostic accuracy of Berlin's new ARDS stratification are uncertain.

**Methods:** We did a retrospective analysis of hospital and 6 month mortality of patients with ARDS admitted to the Intensive Care Unit of a University Hospital in Buenos Aires, between January 2008 and June 2011. ARDS was defined by PaO<sub>2</sub>/FiO<sub>2</sub> lower than 200 mmHg under ventilation with at least 10 cmH<sub>2</sub>O of PEEP and a FiO<sub>2</sub> higher or equal than 0.5 and the presence of bilateral infiltrates in chest radiography, in the absence of cardiogenic acute pulmonary edema, during the first 72 h of mechanical ventilation. Mortality associated risk factors, the use of rescue therapies and Berlin's stratification for moderate and severe ARDS patients were considered.

**Results:** Ninety eight patients were included; mean age was 59 ± 19 years old, 42.9% had mayor co-morbidities; APACHE II at admission was 22 ± 7; SOFA at day 1 was 8 ± 3. Prone position ventilation was applied in 20.4% and rescue measures in 12.2% (12 patients with nitric oxide and 1 with extracorporeal membrane oxygenation). Hospital and 6 months mortality were 37.7 and 43.8% respectively. After logistic regression analysis, only age, the presence of septic shock at admission, Ppl > 30 cmH<sub>2</sub>O, and major co-morbidities were independently associated with hospital outcome. There was no difference between moderate and severe groups (41.2 and 36.8% respectively; *p* = 0.25).

**Conclusion:** In this cohort, including patients with severe hypoxemia and high percentage of mayor co-morbidities, ARDS associated mortality was lower than some previous studies. There

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was no increase in mortality after hospital discharge. There was no difference in mortality between moderate and severe groups according to Berlin's definition.

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## PALABRAS CLAVE

Síndrome de distress respiratorio agudo; Mortalidad; Insuficiencia respiratoria; Terapias de rescate en síndrome de distress respiratorio agudo

## Mortalidad en pacientes con síndrome de *distress* respiratorio

### Resumen

**Introducción:** La mortalidad del *distress* respiratorio agudo está disminuyendo, aunque hay poca evidencia sobre su pronóstico después del egreso hospitalario y la adecuada estratificación pronóstica con la nueva clasificación de Berlín.

**Métodos:** Se analizó retrospectivamente la mortalidad de pacientes con SDRA admitidos en la Unidad de Cuidados Críticos de1 Hospital Universitario de la ciudad de Buenos Aires, desde el 1 de 2008 hasta el 6 de 2011. Se definió SDRA por hipoxemia con  $\text{PaO}_2/\text{FiO}_2 \leq 200$  mmHg con al menos 10 cmH<sub>2</sub>O de PEEP y  $\text{FiO}_2 \geq 0,5$  e infiltrados bilaterales en la radiografía de tórax en ausencia de edema agudo de pulmón cardiogénico en las primeras 72h de ventilación mecánica. Se registraron la mortalidad hospitalaria y a 6 meses, los factores asociados a mortalidad, la utilización de terapias de rescate, y la validez de la clasificación de Berlín para casos moderados y graves.

**Resultados:** Se incluyeron 98 pacientes; edad  $59 \pm 19$  años; 42,9% con comorbilidades mayores; APACHEII  $22 \pm 7$ ; SOFA (día 1)  $8 \pm 3$ . La VM en posición prono se aplicó en 20,4% y en 12,2% rescates especiales (12 óxido nítrico y 1 ECMO). La mortalidad hospitalaria y a 6 meses fue de 37,7 y 43,8% respectivamente. Los factores asociados a mortalidad fueron: edad, shock séptico en las primeras 72 h, presión plateau (Ppl)  $>30$ cmH<sub>2</sub>O durante las primeras 72 h y la presencia de comorbilidades preexistentes. No hubo diferencia de mortalidad entre los grupos moderado y grave (41,2 vs. 36,8%;  $p=0,25$ ).

**Conclusiones:** En este estudio que incluyó pacientes con hipoxemia más grave y alto porcentaje con comorbilidades mayores, la mortalidad fue menor que en algunos estudios previos; no hubo incremento en la mortalidad después del egreso hospitalario. La clasificación de Berlín no diferenció el pronóstico entre los casos moderados y graves.

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## Introduction

Despite improved knowledge of the physiopathology of acute respiratory distress syndrome (ARDS) and technological advances, controversy remains as to whether there has been a resulting decrease in patient mortality. In this regard, recent epidemiological studies describe a high in-hospital mortality rate despite the introduction of protective mechanical ventilation (MV) strategies.<sup>1,2</sup> However, in patients with important hypoxemia, the use of higher positive end-expiratory pressure (PEEP) levels could reduce mortality associated to refractory hypoxemia, the need for rescue therapeutic measures, and the days on MV.<sup>3-5</sup> Likewise, and as indicated by a recent trial, MV in the prone position appears to result in significantly improved survival.<sup>6</sup> However, randomized clinical trials tend to exclude seriously ill patients and individuals with a poorer prognosis.<sup>7</sup> It therefore would be very interesting to obtain prognostic information from studies conducted outside the specific context of clinical trials, and involving protective MV strategies with low tidal volumes (Vt) and higher PEEP levels.<sup>8</sup>

A recently proposed definition of ARDS has included a minimum PEEP level for considering oxygen alteration, and

has classified severity according to the  $\text{PaO}_2/\text{FiO}_2$  ratio.<sup>9</sup> Since its publication, some authors have questioned the clinical usefulness of this stratification, since the PEEP value at the time of diagnosis does not appear to have prognostic relevance,<sup>10,11</sup> at least not without adapting  $\text{PaO}_2/\text{FiO}_2$  to standardized PEEP and  $\text{FiO}_2$  levels.

The present study describes mortality among the patients with ARDS in our Intensive Care Unit (ICU), including only those individuals with moderate to severe ARDS and persistent hypoxemia after 24h of MV, with adjusted PEEP and  $\text{FiO}_2$  levels. Likewise, it defines the conditions associated to mortality, and determines whether the Berlin classification allows prognostic stratification of our patients.

## Material and methods

### Patients

A review was made of the case histories of all the patients admitted to our ICU between January 2008 and June 2011. We initially selected patients over 18 years of age with a diagnosis of ARDS according to the criteria of the

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