

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/burns

Comparison of the Berlin definition with the American European Consensus definition for acute respiratory distress syndrome in burn patients

Julien Bordes*, Guillaume Lacroix, Pierre Esnault, Philippe Goutorbe, Jean Cotte, Eric Dantzer, Eric Meaudre

Sainte Anne Military Teaching Hospital, Burn Centre, Toulon, France

ARTICLE INFO

Article history:

Accepted 6 March 2014

Keywords:

Burn

Berlin definition

Acute respiratory distress syndrome

Inhalation injury

ABSTRACT

Objective: Acute respiratory distress syndrome (ARDS) is a leading cause of mortality in burn patients. Smoke inhalation, pneumonia and inflammation process are the major causes of ARDS in burn patients. The American European Consensus Conference (AECC) definition proposed in 1994 has recently been revised by the Berlin definition. Our objective was to describe the epidemiology of ARDS comparing the Berlin definition with the AECC definition in a retrospective cohort of burn patients.

Methods: We reviewed admitted burn adult patients for a two year period, and investigated patient who received mechanical ventilation for more than 48 h and in whom pneumonia was diagnosed.

Results: 40 patients were analyzed. According to the AECC definition, 11 patients met criteria for ALI (27.5%), and 29 patients for ARDS (72.5%). According to the Berlin definition, all patients met criteria for ARDS: 4 (10%) for a severe ARDS, 25 (62.5%) for a moderate ARDS, 11 (27.5%) for a mild ARDS. Inhalation injury was diagnosed in 10 patients (25%). Categorizing patients with the Berlin definition showed statistically significant difference of mortality within the three groups, but not with the AECC definition.

Conclusion: The Berlin definition seems to be more accurate than the AECC definition to assess the severity of ARDS in term of outcome in burn patients. This definition may facilitate prompt recognition of ARDS in burn patients, and promote protective ventilation strategy to a larger number of patients.

© 2014 Elsevier Ltd and ISBI. All rights reserved.

1. Introduction

Acute respiratory distress syndrome (ARDS) is a common complication in critically ill burn patients leading to increased mortality. Smoke inhalation, pneumonia and inflammation

process mediated by the burn are the major causes of ARDS in burn patients.

A joint American European Consensus Conference (AECC) proposed in 1994 a definition based on the degree of oxygenation impairment, separating two syndromes: the ARDS and the acute lung injury (ALI) [1]. The criteria for

* Corresponding author. Tel.: +33 483162385.

E-mail address: bordes.julien@neuf.fr (J. Bordes).

<http://dx.doi.org/10.1016/j.burns.2014.03.004>

0305-4179/© 2014 Elsevier Ltd and ISBI. All rights reserved.

ARDS were a $\text{PaO}_2/\text{fraction of inspired oxygen (PAFI)} \leq 200$ mmHg, presence of bilateral infiltrates compatible with pulmonary edema, and absence of cardiogenic pulmonary edema defined as a pulmonary artery wedge pressure (PAWP) ≥ 18 mmHg. The term ALI was defined by the same criteria except that the $\text{PaO}_2/\text{FiO}_2 > 200$ mmHg and ≤ 300 mmHg.

However, it has been argued that this definition may not reflect the true prevalence, severity, and prognosis of these syndromes. The major criticism was that $\text{PaO}_2/\text{FiO}_2$ may vary in response to ventilator settings, particularly PEEP [2,3]. Moreover, patients with ARDS may have also elevated PAWP [4,5]. As a result, a revised definition of ARDS was recently proposed, the Berlin definition [6,7]. It was proposed 3 categories of ARDS based on degree of hypoxemia: mild ($200 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$), moderate ($100 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mmHg}$) and severe ($\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mmHg}$), with a PEEP $\geq 5 \text{ cmH}_2\text{O}$. This revised definition aimed to facilitate case recognition, institution of standardized best-evidence treatment and also assist with prognostication and design of new research trials.

Our objective was to describe the epidemiology of ARDS comparing the Berlin definition with the AECC definition in a retrospective cohort of burn patients.

2. Materials and methods

2.1. Study

This study was a retrospective review of patients admitted in the burn intensive care unit (ICU) of Sainte Military Teaching Hospital. All Patients admitted in 2010 and 2011 were screened for eligibility.

2.2. Patients

Inclusion criteria were patients having received mechanical ventilation for more than 48 h in whom pneumonia was diagnosed.

2.3. Pneumonia definition

The presence of pneumonia required signs of infection (elevated white blood cell (WBC) count, fever or hypothermia), with a compatible chest image (chest X-ray or Ct-scan). The modified clinical pulmonary infection score was used to diagnose pneumonia [8].

Microbiologic diagnosis was made by a positive blood culture and/or lower-airway secretions. In our burn care unit, all patients with suspected pneumonia undergo semi-invasive testing with fiberoptic bronchoscope-guided distal-protected

small volume bronchoalveolar lavage (FODP mini-BAL) as a routine, protocolized basis technique, described elsewhere [9]. We also considered a positive urine antigen for either *Streptococcus pneumoniae* or *Legionella* as evidence of a bacterial process.

During the study, day 1 of pneumonia was defined as the first day of antibiotics. Only the first episode of pneumonia was analyzed.

2.4. Smoke inhalation injury definition

Inhalation injury was diagnosed by the presence of lesions on the respiratory tract confirmed bronchoscopically [10].

2.5. ARDS definitions

ARDS was defined according to the AECC and Berlin definitions (Tables 1 and 2).

In our ICU, cardiac failure or fluid overload is diagnosed by one of these two methods:

- Pulmonary artery wedge pressure (a pulmonary artery catheter is inserted in patient with total burn skin surface area (TBSA) $> 40\%$ or $> 20\%$ when associated with smoke inhalation injury), with a cut off > 18 mmHg.
- Central venous pressure with a cut off > 15 mmHg.

2.6. Data collected

On admission, the following parameters were recorded: age, gender, total burn surface area (TBSA), deep burn surface area (DBSA), burn nature, need for escharotomy, presence of inhalation injury, need for endotracheal intubation and invasive mechanical ventilation, IGS2 score, SOFA score.

During ICU stay, the following parameters were collected: duration of invasive mechanical ventilation, ICU length of stay, microbiologic sample results, pneumonia episode as previously defined, data needed to assess SOFA score:

- need for vasoactive drugs;
- Glasgow Coma Scale score;
- Creatine concentration and urine output;
- PaO_2 and FiO_2 to calculate $\text{PaO}_2/\text{FiO}_2$ ratio (PaFi);
- Platelet count;
- bilirubin concentration;
- mean arterial pressure.

During pneumonia episode, SOFA score, WBC counts, CRP, worse PAFI, maximal settled PEP on ventilator were recording daily.

Table 1 – The American European Conference Consensus ARDS definition [1].

	Timing	Oxygenation	Radiological abnormalities	Pulmonary artery wedge pressure
ALI	Acute onset	≤ 300 regardless of PEEP	Bilateral infiltrates on frontal chest radiograph	≤ 18 mmHg when measured or no clinical evidence of left atrial hypertension
ARDS	Acute onset	≤ 200 regardless of PEEP	Bilateral infiltrates on frontal chest radiograph	≤ 18 mmHg when measured or no clinical evidence of left atrial hypertension

Download English Version:

<https://daneshyari.com/en/article/3104478>

Download Persian Version:

<https://daneshyari.com/article/3104478>

[Daneshyari.com](https://daneshyari.com)