

## Letter

# Positive end-expiratory pressure or no positive end-expiratory pressure: is that the question to be asked?

Jesús Villar

Director, Research Institute, Hospital NS de Candelaria, Tenerife, Canary Islands, Spain

Correspondence: Dr Jesús Villar, [jesus.villar@canarias.org](mailto:jesus.villar@canarias.org)

Published online: 20 January 2003

This article is online at <http://ccforum.com/content/7/2/192>

© 2003 BioMed Central Ltd (Print ISSN 1364-8535; Online ISSN 1466-609X)

*Critical Care* 2003, **7**:192 (DOI 10.1186/cc1878)

Positive end-expiratory pressure (PEEP) is an essential technique for the respiratory care of many critically ill patients who require ventilatory support. With the application of PEEP, the baseline end-expiratory pressure in mechanically ventilated patients is elevated above atmospheric pressure. In general, the application of PEEP is expected to improve lung mechanics and gas exchange as it recruits lung volume in selected patients. During the past three decades, research on the effects of PEEP in animal models of acute lung injury and in patients with acute respiratory failure has produced a plethora of information.

In the present issue of *Critical Care Forum*, Fernández-Mondejar and colleagues [1] comment that there is a need for clinical studies to reassess the value of prophylactic PEEP. Although numerous approaches to the application of PEEP have been described, no controlled studies demonstrating the best method of choosing the level of PEEP have been published to date.

Although the optimal method of applying PEEP is still controversial, it is generally agreed that simply using increased arterial partial pressure of oxygen as the end point is inappropriate. Although recent reports have supported the beneficial effects of relatively high levels of PEEP on morbidity and mortality in patients with acute lung injury, it is still not clear how much PEEP is required in the ventilatory management of patients with acute respiratory failure. In practice, PEEP has been used in the way advocated by Albert [2]; that is, the lowest level of PEEP that maintains an adequate arterial partial pressure of oxygen on an inspiratory fraction of oxygen less than 60%.

In a recent multicenter, observational study, Esteban and colleagues [3] found that, in general, physicians around the globe make little effort to define the adequate or optimum level of PEEP. They found, first, that most physicians applied a median level of 5 cmH<sub>2</sub>O PEEP, probably reflecting the commentary by Fernández-Mondejar and colleagues [1].

Esteban and colleagues also found that most physicians are afraid of applying levels of PEEP > 10 cmH<sub>2</sub>O and, finally, that one-third of intensive care unit patients were ventilated with zero PEEP.

If PEEP can markedly improve lung compliance by alveolar recruitment, why are physicians reluctant to seek the specific level of PEEP that is best for each individual patient? Ample experimental and clinical evidence suggests that there is a wide variability in the adequate level of PEEP in each animal or patient. Is PEEP different from other therapeutic maneuvers in the intensive care unit setting? As with other therapies, and depending on the severity of the patient's lung disease, we should titrate the level of PEEP that any patient requires at any given period during the clinical evolution. In the same way that there is no a universal dosage of sodium nitroprussiate to decrease systemic vascular resistance, it would be difficult to propose a universal level of PEEP for all patients with respiratory failure. Therefore, it is not whether we apply or do not apply a 'prophylactic' or generic level of 5 or 7 cmH<sub>2</sub>O PEEP what we need to consider. It is the level of PEEP that each one of our patients requires to reach the therapeutic goals supported by the best evidence we have.

## Competing interests

None declared.

## Acknowledgement

Supported, in part, by Fondo de Investigación Sanitaria of Spain (00/0564).

## References

1. Fernández-Mondejar E, Chavero MJ, Machado J: **Prophylactic PEEP: are good intentions enough?** *Crit Care* 2003, **7**:191.
2. Albert RK: **Least PEEP: primum non nocere.** *Chest* 1985, **87**:2-4.
3. Esteban A, Anzueto A, Alia I, Gordo F, Apezteguia C, Palizas F, Cide D, Goldwaser R, Soto L, Bugedo G, Rodrigo C, Pimentel J, Raimondi G, Tobin MJ: **How is mechanical ventilation employed in the intensive care unit?** *Am J Respir Crit Care Med* 2000, **161**:1450-1458.