

COMMENTARY

A pseudo-Rumsfeldian approach to pleural effusions in mechanically ventilated patients

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See related research by Goligher *et al.*, <http://ccforum.com/content/15/1/R46>

Abstract

Pleural effusions are common in mechanically ventilated patients but what is their significance and how should we manage them? What do we know? What don't we know? What didn't we know we knew? How should we resolve the unknowns?

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

Donald Rumsfeld,
former US Secretary of Defense

What we know

Small- to medium-sized pleural effusions are very common radiological findings in mechanically ventilated patients. The pathophysiological causes of pleural effusions in mechanically ventilated patients are well understood with variable contributions from cardiovascular and lymphatic hydrostatic forces, inflammatory changes in vascular permeability, changes in the osmotic and oncotic milieu, and positive pressure ventilation.

What we don't know

What are the physiological and prognostic consequences of unilateral and bilateral effusions in mechanically ventilated patients? There are no established methods that assess the physiological impact of a pleural effusion, in terms of gas exchange, pulmonary mechanics, or work of breathing, and hence that predict the potential benefit of drainage. It can be argued that a pleural effusion will cause some degree of local atelectasis in dependent lung

parenchyma, resulting in a negative effect on global ventilation perfusion matching and increasing the risks of pneumonia and empyema. Additional potential sequelae include diaphragmatic dysfunction, an increase in the work of breathing, and delayed/protracted weaning from support. Accordingly, enthusiasts for an aggressive drainage management strategy claim that such an approach is safe and effective. However, advocates of a minimal intervention strategy are equally vociferous.

What we didn't know we knew

As a starting point in establishing some of the answers to these questions, Goligher and colleagues [1] present their systematic review and meta-analysis of available evidence in the previous issue of *Critical Care*. Their meticulous literature review reveals a surprising lack of published data (19 studies and 1,124 patients) given the very high incidence of this pathology. In particular, the authors found no controlled trials or trials that reported meaningful clinical outcomes. What few data there are suggest an unpredictable improvement in short-term oxygenation, the clinical consequences of which are unknown, and an apparently very low rate of significant complications. The authors of one of the included studies reported that thoracocentesis 'changed the diagnosis' in 49 of 113 patients and resulted in 'a modification of treatment' in 35 [2]. However, this failed to have a measurable effect on clinical outcome. One other study reported that thoracocentesis 'affected management' in 24 of 32 cases [3]. There is an apparent logical disconnect between claims of such high rates of the value of thoracocentesis and the lack of meaningful effects. Goligher and colleagues conclude that there is no convincing evidence to support any management strategy.

How should we resolve the unknowns?

The management of pleural effusions in mechanically ventilated patients can hardly be described as a headline-grabbing topic. It is, however, a sobering example of a common intensive care unit pathology that has been neglected as a topic of informative research, and in this respect, it is not alone. Is there an argument that such

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topics should be propelled up the research agenda? I would argue that, yes, it is clinically and ethically vital that we get all of the common and simple things right before we succumb to the allure of complex new therapies and interventions. We should develop reliable bedside assessments of the probable functional significance of a pleural effusion and design trials that provide answers that guide our management.

Competing interests

The author declares that he has no competing interests.

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