

# Prone positioning of influenza H1N1 2009 patients with acute respiratory distress syndrome

Abed El Raouf M Bayya and David M Linton



**TO THE EDITOR:** Prone positioning is used internationally and often recommended for patients with acute respiratory distress syndrome (ARDS).<sup>1,2</sup> We have evidence suggesting it may be even more relevant in ARDS caused by influenza H1N1 2009 than in ARDS with other causes.

In October and November 2009, 12 patients with confirmed H1N1 influenza 2009 were admitted to the medical intensive care units at Hadassah Hospital, Jerusalem, and Hebron Hospital in the Palestinian territory. Six developed life-threatening severe ARDS, and we observed impressive responses to prone positioning in the four patients with the most severe hypoxia.

For example, a 36-year-old man with multiple myeloma developed severe H1N1 09 ARDS 3 months after autologous bone marrow transplantation. He was treated with oseltamivir and prophylactic anticoagulation and antibiotics. The H1N1 09 influenza virus was persistently identified in bronchoalveolar lavage fluid, and peramivir was added. Despite sedation, paralysis, pressure control ventilation at 30 cm, optimal positive end-expiratory pressure (PEEP), nitric oxide and recruitment manoeuvres, his condition deteriorated until his  $SaO_2$  could not be maintained above 75%. As the ICU does not have extracorporeal membrane oxygenation (ECMO) capability, we used prone positioning for an 8-hour period once daily as a last resort. There was a dramatic and sustained improvement in oxygenation. After 10 days, the patient's  $SaO_2$  was >95% during ventilation with pressure support of 14 cm,  $F_{iO_2}$  of 30%, and PEEP of 4 cm. He was discharged to the haematology department for further management of the basic disease.

In the ICU at Hebron Hospital, a 36-year-old woman who was 20 weeks' pregnant in her sixth pregnancy developed severe H1N1 09 ARDS. Despite inverse-ratio pressure con-

trol ventilation, maximal PEEP, and administration of oseltamivir, prophylactic anticoagulation and antibiotics, the pregnancy spontaneously aborted, and the patient developed bilateral pneumothorax and remained critically hypoxic with an  $SaO_2$  of 65%. As neither nitric oxide nor ECMO was available, we advised prone positioning, with dramatic effect. The hypoxia resolved over 3 days of daily 12-hour sessions of prone positioning, and the patient was weaned from ventilation and extubated.

Prone positioning in severe H1N1 ARDS appears to be an important modality for saving life. We postulate two reasons for the apparently more dramatic effect in H1N1 ARDS than in ARDS from other causes:

- The distribution of the lung insult in viral pneumonia tends to be regional, as opposed to more diffuse when the cause is systemic; and
- Drainage of secretions from the basal and dependent segments of the lung is more efficient in the prone position.

It is possible that prone positioning may avoid the need for ECMO in some cases.

**Abed El Raouf M Bayya**, Consultant Intensivist

**David M Linton**, Director

Medical Intensive Care Unit, Department of Medicine, Hadassah University Hospital, Jerusalem, Israel.

dlinton@hadassah.org.il

## References

1. Taccone P, Pesenti A, Latini R, et al; Prone-Supine II Study Group. Prone positioning in patients with moderate and severe acute respiratory distress syndrome: a randomized controlled trial. *JAMA* 2009; 302: 1977-84.
2. Slutsky AS. Improving outcomes in critically ill patients: the seduction of physiology. *JAMA* 2009; 302: 2030-2 □

# When an effect is unclear, questioning its proposed mechanism is appropriate

Jeremy Cohen and Bala Venkatesh



**TO THE EDITOR:** We read with great interest Reade's thoughtful editorial on adrenal function testing, and agree with much of what he had to say.<sup>1</sup> However, we take issue with his proposal that we do not need to understand the mechanism of an effect in order to profit by it, for which he offered the examples of gravity and general anaesthesia. This argument is valid with an important caveat: there must be clear and incontrovertible evidence that the phenomenon under discussion actually exists. No one would doubt the existence of gravity or the efficacy of general anaesthesia, but even the most fervent supporters of corticosteroid treatment would hesitate to state that the evidence for benefit is as clear as the observation that apples fall from trees.

The data suggesting that steroid supplementation in septic shock is worthwhile remain debatable. The two largest studies have produced divergent results,<sup>2,3</sup> and we have good reason for caution in accepting the results of meta-analyses in this setting.<sup>4,5</sup> When the existence of an outcome benefit is unclear, the question of biological plausibility becomes relevant, and should be considered as part of the totality of evidence. The proposed concept of "critical illness-related corticosteroid insufficiency"<sup>6</sup> suffers from many of the limitations that apply to relative adrenal insufficiency. Glucocorticoid treatment is not necessarily benign and may be associated with myopathy, immunosuppression, poor wound healing, superinfection and

mortality. This has been a long-running controversy in our speciality, and we completely agree with Reade that the question will be settled only by the evidence from an adequately powered definitive trial. To quote Isaac Newton, "It is the weight, not numbers of experiments that is to be regarded".

Jeremy Cohen, Staff Specialist in Intensive Care<sup>1</sup>

Bala Venkatesh, Professor of Intensive Care<sup>2</sup>

1 Burns, Trauma and Critical Care Research Centre, University of Queensland, Brisbane, QLD.

2 Princess Alexandra and Wesley Hospitals and University of Queensland, Brisbane, QLD.

## References

1. Reade M. Should we question if something works just because we don't know how it works? *Crit Care Resusc* 2009; 11: 235-6.
2. Annane D, Sebille V, Charpentier C, et al. Effect of treatment with low doses of hydrocortisone and fludrocortisone on mortality in patients with septic shock. *JAMA* 2002; 288: 862-71.
3. Sprung CL, Annane D, Keh D, et al. Hydrocortisone therapy for patients with septic shock. *N Engl J Med* 2008; 358: 111-24.
4. Human albumin administration in critically ill patients: systematic review of randomised controlled trials. Cochrane Injuries Group Albumin Reviewers. *BMJ* 1998; 317: 235-40.
5. Finfer S, Bellomo R, Boyce N, et al. A comparison of albumin and saline for fluid resuscitation in the intensive care unit. *N Engl J Med* 2004; 350: 2247-56.
6. Marik PE, Pastores SM, Annane D, et al. Recommendations for the diagnosis and management of corticosteroid insufficiency in critically ill adult patients: consensus statements from an international task force by the American College of Critical Care Medicine. *Crit Care Med* 2008; 36: 1937-49. □