

## Paper reports

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### Avoiding secondary insults in ICU

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There are relatively few treatments that directly improve outcome in critically ill patients. The mainstay of good intensive care remains supportive therapy for failing organs while strenuous attempts are made to avoid iatrogenic damage and nosocomial infection. A number of recent paper reports have focused on these last two areas.

Even an intervention as fundamental as intermittent positive pressure ventilation may be harmful if applied incorrectly and so the international consensus conference on ventilator-associated lung injury (VLI) in acute respiratory distress syndrome (ARDS) is timely. The animal data for VLI is now compelling, but the evidence in humans necessarily remains indirect. Nevertheless, the recently completed National Institutes of Health study has shown that protective ventilation strategies can improve outcome. The consensus conference also covers risk factors, incidence, monitoring, morbidity and prevention of VLI.

Blood transfusion carries a small but quantifiable risk of infection with HIV and other organisms. Since the average transfusion requirement of intensive care unit (ICU) patients is around three units per week, it was pertinent to investigate whether recombinant human erythropoietin (rHuEPO) would reduce the volume of blood given to ICU patients. Gettinger and colleagues demonstrated a cumulative reduction, in transfused blood, of nearly 50% in ICU patients treated with rHuEPO, but found no difference in mortality or adverse events. Treatment with rHuEPO was more expensive than blood transfusion, but in different healthcare systems or with increasing scarcity of blood this might not always be the case. Furthermore, the medico-legal consequences of this finding are potentially wide-ranging. Some Jehovah's Witnesses admitted to the ICU will demand treatment with rHuEPO, and the very rare patient who becomes infected after blood transfusion might in future ask what measures were taken to minimise transfusion requirement.

Percutaneous tracheostomy is an example of an intervention which carries a risk of harm but is nevertheless widely perceived to be beneficial (despite the absence of data to support improved outcomes). Escarment and colleagues have published a case series of 162 patients, showing

that the risks of the Griggs technique are real but relatively small, and no greater than those of the Ciaglia technique.

Martin and colleagues investigate the unusual axillary approach to the central veins. Nearly 12% of patients developed radiological evidence of venous thrombosis, even though all received low molecular weight heparin. This figure is similar to that reported following jugular vein cannulation. The risk of thrombosis is greatest for patients with catheters *in situ* more than 14 days and the authors advise against long-term use of this site.

Three paper reports examine different aspects of nosocomial infection. Vicca and colleagues ask the interesting question of whether high nursing workload contributes to methicillin resistant *Staphylococcus aureus* (MRSA) spread in the ICU. The study was observational and only 50 patients with MRSA carriage were identified. Further research is needed to confirm their plausible view that staff shortages increase nosocomial infections.

Ventilator associated pneumonia (VAP) remains a major problem for intubated ICU patients and the subject has been comprehensively reviewed by Higgins. The importance of differentiating colonisation from infection and the role of invasive procedures in diagnosis are covered in detail. Interestingly, there have been no studies that document improved outcome from VAP when invasive techniques are used. Since fiberoptic bronchoscopy adds some risk and considerable costs to the management of ventilated patients, it cannot yet be recommended for all patients.

The idea of giving supplemented oxygen to prevent surgical wound infections in patients having colo-rectal surgery might seem too simple to be effective. However in a large (500 patients) prospective randomised trial, Greif and colleagues have demonstrated a 50% reduction in wound infections for patients given supplemented oxygen (80% versus 30%) intra-operatively and for 2 h post-operatively. There was no difference in length of hospital stay or mortality. A subgroup analysis of only 30 patients showed no adverse effect on pulmonary function or atelectasis in the 80% oxygen group. Despite this reassuring finding, more

data are needed to establish beyond doubt that there are no harmful pulmonary effects from such a high concentration of oxygen.

Noninvasive ventilation (NIV) is being used more frequently since it was shown to be beneficial in patients with respiratory failure from chronic obstructive pulmonary disease (COPD). Kilger *et al* used NIV in patients after early extubation, mainly following lung transplantation. They showed an improvement in oxygenation and ventilatory parameters and their results suggest that NIV may be a useful weaning tool. Jolliet and colleagues studied patients with COPD and compared NIV using a helium : oxygen mixture or oxygen-enriched air. Impressively, they managed to avoid endotracheal intubation in all 20 patients. NIV improved many ventilatory parameters and there was a statistically significant decrease in  $p\text{CO}_2$  and dyspnoea with the helium : oxygen mixture. Larger numbers will be needed to determine whether there are any clinically significant benefits of helium : oxygen mixture.

The wide variety of diagnoses in critically ill patients is a constant challenge to the general intensive care physician who needs to keep abreast of the latest advances in many areas of medicine. The comprehensive review of unstable

angina by Yeghiazarians and colleagues is excellent in all areas but deals particularly well with pathogenesis and the role of new antiplatelet agents.

Viallon and colleagues address the use of intravenous bicarbonate therapy in patients with diabetic ketoacidosis. Although the study was retrospective, patients were well matched for arterial pH. It is interesting that the time to pH normalisation and urinary ketone clearance was the same whether or not patients received bicarbonate.

Finally, Azoulay and colleagues have examined outcome in 75 patients with multiple myeloma admitted to their intensive care unit between 1992 and 1998. In a multivariate analysis, invasive mechanical ventilation and vasopressor agents were associated with increased mortality and disease remission with decreased mortality. Nevertheless, 20% of mechanically ventilated patients and 26% of patients treated with vasopressors survived 30 days. Data on medium and long-term survival would clearly have been more informative. Arguably, it is unlikely that series such as this will ever be able to offer definite admission criteria for patients with poor prognoses – the case for sensitive judgements by experienced, scientifically up to date clinicians remains as strong as ever.