Adult respiratory distress syndrome: has there been a change in outcome predictive measures?

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Abstract

Background – Studies suggest that the mortality in adults with acute respiratory distress (ARDS) has not changed over the past two decades, despite the introduction of new therapeutic techniques and sophisticated ventilatory support devices. Mortality and physiological variables that might predict outcome in patients with ARDS were therefore assessed.

Methods – A retrospective survey was undertaken in 41 patients with ARDS. Results – Mortality was 66%. Only the presence of sepsis predicted death. Conclusion – Mortality from ARDS is unchanged. Currently available severity scoring systems are not helpful in predicting outcome.

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Acute respiratory distress was first described in adults (ARDS) in 1967, but controversy still surrounds its aetiology, clinical management strategies, and epidemiology.¹ The incidence of ARDS varies from 1000 to 15,000 cases per year in the UK, and between 50,000 and 150,000 cases per year in the USA. The syndrome continues to stimulate both basic and clinical research, which has resulted in the introduction of a number of new systems of ventilatory and pulmonary support including pressure controlled, inverse ratio ventilation (PC-IRV); high or ultra high frequency jet ventilation (UHFJV); intravenous oxygenation ("IVOX") and extracorporeal gas exchange (ECGE). The use of such expensive and invasive techniques, and the need to ration their application to those individuals most likely to benefit, has led to interest in the development of tools to predict outcome at the time of diagnosis. Standard critical care severity of illness scoring systems such as APACHE II and more specialised lung orientated systems such as the acute lung injury score (LIS), together with semiquantitative assessment of associated organ dysfunction, have been widely applied to this end, but their predictive power remains unproven. In a retrospective study the mortality of a group of patients with ARDS was examined with regard to physiological variables that might be predictive of death, severity scoring systems designed to aid in establishing prognosis at the time of diagnosis, and the possible role of new methods of ventilatory support in altering outcome.
Discussion

This study revealed that (1) the mortality associated with ARDS has changed little in recent years despite the advent of new forms of ventilatory support; (2) only associated sepsis is important in determining outcome; and (3) both general and lung orientated severity scoring systems are unhelpful in discriminating survivors from non-survivors at presentation. Our mortality data are in agreement with most3–6 but not all,7 recent publications in which survival figures for patients with ARDS vary from 53% to 74%.

It is possible that the patient population referred to a tertiary centre such as ours might differ from those described in previous publications. Indeed, the severity of hypoxaemia in our population appears generally worse than those of the other series quoted above.8 However, although over 50% of our patients were referred from other hospitals their mortality was better (59%) than that of the “resident” patients (74%).

The fact that the number of organ systems in failure at the time of data collection did not predict outcome might be considered surprising in view of data previously published by Knaus et al.9 However, the physiological and laboratory parameters for organ dysfunction used here differ in many respects from the earlier study which did not incorporate haematological, hepatic, or gastrointestinal criteria. The presence of sepsis and possibly cardiovascular dysfunction seemed to be important in this regard. In previous series sepsis has been described as a leading cause of death in patients with ARDS3–6 and cardiac dysfunction7 to a lesser degree. In agreement with the current results, primary lung failure has also been described as an adverse prognostic sign.2

Studies of ARDS are frequently not comparable because of varying definitions and the inhomogeneity of patients, but the LIS offered the promise of greater compatibility between studies. In the current study, however, LIS could not be shown to predict outcome. The APACHE II score had limited value and was of most use in those patients who did not undergo elective operations. However, it was often scored relatively late in the admission (due to interhospital transfer) and its use in this respect is invalidated. No firm conclusions could be drawn regarding the possible influence of new techniques of ventilatory support on mortality. Absolute numbers were small and patients were not randomly divided into conventional and non-conventional treatment arms.

In conclusion, it appears that the mortality from ARDS remains high despite advances in ventilatory support techniques. In common with others, we have found sepsis to be an associated condition with adverse prognostic implications. Currently available severity scoring systems seem to be little use in predicting outcome.