Bacterial co-infection and interpretation of immunological data from BAL fluid specimens in severe RSV bronchiolitis

Thorburn et al reported on pulmonary bacterial co-infection in children with severe respiratory syncytial virus (RSV) bronchiolitis. The authors found that 40% of children with severe RSV infection were infected with bacteria in their lower airways. The most commonly isolated organism was Haemophilus influenzae, a Gram negative lipopolysaccharide producing organism.

Previous studies from the same paediatric intensive care unit have investigated cytokines, chemokines, and the cellular composition of specimens obtained by nonbronchoscopic bronchoalveolar lavage (BAL) in ventilated children with RSV infection using the same method as was used in this study. The investigators found a predominance of neutrophil leukocytes, increased production of interleukin (IL)-9, and increased levels of a number of chemokines compared with controls without lower respiratory tract infection.

Lipopolysaccharide, as produced by H influenzae, is a potent activator of the nuclear transcription factor NF-κB. NF-κB is essential in activating IL-9 production and in the production of an array of chemokines. The neutrophilia found in the airways of children with severe RSV bronchiolitis may be partly due to bacterial stimulation of the production of the neutrophil leukocyte attracting chemo- kine IL-8 via NF-κB activation and indirectly via IL-9 stimulating IL-8 production. Neutrophil leukocytes can contribute to IL-8 production after IL-9 stimulation of its IL-9 receptors, and McNamara et al have demonstrated IL-9 bound to neutrophils by immuno- fluorescence studies in lavage samples.

Futures studies investigating the immunopathogenesis of the lower respiratory tract of children with RSV infection need to rule out bacterial co-infection to obtain an unbiased view of the immunopathogenesis of this disease.

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Competing interests: none.

References

Still awaiting a useful tool for predicting severe CAP

We agree with Buisin et al that severity scores for community acquired pneumonia (CAP) that are accurate for predicting 30 day mortality, such as the pneumonia severity index (PSI) and CURB-65, are unlikely to be as useful for predicting the need for admission to the intensive care unit (ICU). In our institution, as their paper describes, the patients who die from CAP are generally older, have unstable co-morbid conditions, and are made "not for resuscitation", so are not suitable candidates for admission to the ICU. We also agree that the revised American Thoracic Society criteria are of very limited use as a tool for predicting severe CAP as the major criteria (need for mechanical ventilation or intravenous inotropic support) identify patients who should already be in the ICU rather than predict those who will need it.

However, we have some concerns with the methodology used to validate the scoring systems in their study. The entry criteria based on the admission diagnosis of CAP could lead to errors since, in our experience, the admission diagnosis is frequently incorrect. Published reports suggest that the disparity between clinicians’ reports of chest radiographs for CAP and those reported by radiologists is high, with 20–50% of radiographs not confirmed as demonstrating pneumonia, despite the clinician's assessment as such. In our own institution, a review of the radiographs of almost 1000 patients admitted with an emergency department diagnosis and radiologist reports in patients discharged from an emergency department with suspected pneumonia. Emerg Radiol 2005;11:242–5.


Authors’ reply

Charles et al have raised two important issues concerning our study:

1. Should scoring systems intended to guide admission or the need for ICU assessment or empirical antibiotic choices be built using the data from patients who the examining clinicians believe to have pneumonia based upon their interpretation of the chest radiograph (that is, exactly the group of patients to whom the scoring system will be applied in practice), or should they be built only using data from those patients in whom the radiologist described consolidation on the chest radiograph? We chose the former in order to make the results as directly relevant and applicable as possible and note that, in 88% of our patients, the treating clinicians applied a discharge diagnosis (with knowledge of the radiologist’s report) of pneumonia.

2. Having chosen the patient group, should we build the model with data available to the emergency department clinician
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