Risk Factors May Help Triage Severe Bronchiolitis

BY BETSY BATES
Los Angeles Bureau

HONOLULU — Three recent prospective studies—two conducted in the United States and one in Canada—have begun to tease out risk factors that might identify which infants with bronchiolitis are at risk of severe disease.

As the most common disease of the lower respiratory tract in young children, bronchiolitis leads to 100,000 annual hospital admissions, although it has been frustratingly difficult to pinpoint which patients require intensive measures.

Researchers offered some clues in studies presented back to back at the annual meeting of the Pediatric Academic Societies.

A prospective cohort study conducted in 30 U.S. hospitals during two bronchiolitis seasons (2004-2006) found four independent risk factors for ICU admission vs. admission to a regular hospital floor in 1,456 children less than 2 years old.

Dr. Dorothy Damore and coinvestigators of the Multicenter Airway Research Collaboration found that, after adjustment for potential confounders, the following factors predicted severity: age less than 2 months (53% vs. 26%, for an odds ratio of 4.1); inadequate oral intake (53% vs. 31%, OR 3.3); moderate to severe retractions (48% vs. 31%, OR 2.6); prior emergency department visit within the past week (40% vs. 25%, OR 2.2).

Although initial oxygen saturation less than 90% initially emerged as a risk factor for ICU admission, it lost significance during adjustment for other factors.

Respiratory rate was not found to be a predictor for ICU admission in either univariate or multivariate analyses, said Dr. Damore, a pediatric emergency medicine specialist at New York–Presbyterian Hospital and Weill Cornell Medical Center in New York.

Notably, children with chronic medical conditions were included in the analysis.

Dr. Damore said a larger, ongoing study will include virology data in an effort to explore the potential role of infectious etiology in the severity of bronchiolitis.

A second prospective study examining risk factors for severe bronchiolitis was conducted in eight pediatric emergency departments throughout Canada from late 2004 to April 2007.

Among 1,554 infants up to 1 year old admitted with a first episode of bronchiolitis, 35 (2.2%) developed severe bronchiolitis, defined as the need for intubation, apnea, or admission to a pediatric ICU.

No child died during the study, but 5 developed apnea, 10 required intubation, and 31 ultimately needed to be treated in an ICU. The potential for developing severe disease was "not immediately obvious on initial presentation," said Dr. Amy C. Plint of the departments of pediatrics and emergency medicine at the University of Ottawa on behalf of the Pediatric Emergency Research Canada group.

Just half were initially admitted to the ICU from the emergency department. Seven were sent home and required readmission. Four specific risk factors distinguished the children with the most severe disease, but only age overlapped the characteristics highlighted in the study led by Dr. Damore.

In this analysis, 100% of severe cases were marked by one of the following: Oxygen saturation on room air of less than 88%; heart rate of equal to or more than 180 beats/min; respiratory rate of greater than or equal to 80 breaths/min; age less than 7 weeks (slightly younger than the at-risk group identified by the Damore study).

Oxygen saturation also figured prominently in a study conducted in 20 U.S. emergency departments participating in the Pediatric Emergency Care Applied Research Network.

In this study of 598 children 2-11 months old admitted with a first case of bronchiolitis, oxygen saturation less than 94% and a temperature of greater than or equal to 38° C stood out in a multivariate analysis as the factors most predictive of a prolonged inpatient hospital stay.

Lead author Dr. Howard Corneli emphasized that no criterion stood out as "highly predictive," with high sensitivity as well as specificity.

"There is no single [predictive] rule for a complex multifactorial disease," maintained Dr. Corneli, a pediatric emergency medicine specialist at the University of Utah, Salt Lake City.

None of the presenters reported disclosures of financial conflicts of interest with regard to his or her presentation. ■