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Issue No. 11, July 2006, is part of a 12-part CME/CE activity (September 2005 – August 2006).

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Applicants will receive a certificate of participation from PPS by return mail within 6 to 8 weeks of the date of receipt of the completed Evaluation/Registration Form.

#### Learning Objectives

After studying the literature presented in this Pediatric Respiratory Care series, participants will be able to:

- Identify respiratory disorders in pediatric patients
- Summarize risk factors for respiratory disorders in pediatric patients
- Select an appropriate therapeutic regimen for patients with pediatric respiratory disorders

#### Target Audience

This educational activity is designed for pediatricians, primary care physicians, pediatric and family nurse practitioners, neonatologists, infectious disease specialists, allergists, pulmonologists, immunologists, and other healthcare professionals involved in the care and management of pediatric respiratory patients.

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This program has been approved for 2.7 contact hours of continuing education by the American Academy of Nurse Practitioners. Program ID 0601034.

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*Clinical Insights*® in

# PEDIATRIC RESPIRATORY CARE

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## Viral Etiology and/or Eosinophilia May Determine Corticosteroid Efficacy in the Control of Wheezing

The use of corticosteroids in young children with first episodes of acute wheezing is still controversial. While corticosteroid use in children with acute asthma is well documented, there is an insufficiency of studies supporting their use in children with bronchiolitis. The reason for this disparity is not clear, although age does not appear to be a determining factor. Furthermore, the presence of atopy and

eosinophilia, key risk factors for development of asthma, do not correlate with the efficacy of systemic corticosteroids. In a recent study, Tuomas Jartti and colleagues tested the hypothesis that the disparity in corticosteroid response may be related to the viral etiology of acute wheezing, by examining the efficacy of prednisolone (PDN) in reducing early wheezing in children infected by rhinovirus (RV) or respiratory syncytial virus (RSV).

*PDN did not influence time until ready for discharge. In secondary outcomes, PDN reduced the number of wheezing relapses during the subsequent 2-month period in children infected with RV, but not in children infected with RSV.*

Hospitalized children (less than 3 years of age) experiencing their first or second episode of wheezing were randomly assigned in a double-blind manner to receive oral PDN (2 mg/kg; 3 divided doses for 3 days; n=46) or placebo (n=32). Patients with >1 previous wheezing episode, use of inhaled or oral steroids in the preceding 4 weeks, chronic diseases, or severe wheezing requiring intensive medical care were

excluded from the study. On entry to the study, nasopharyngeal aspirates for virus detection, exhaled nitric oxide, and blood samples for eosinophil analysis were collected. The objective was to compare the efficacy of PDN in children infected with RSV or RV. The primary endpoint was time until ready for discharge, while

secondary endpoints included occurrence of relapses within the next 2 months, blood eosinophil count at discharge and 2 weeks

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#### Disclosures:

\* Dr Piedra is an associate professor of molecular virology and microbiology, and pediatrics at Baylor College of Medicine. He has indicated relevant financial relationships as noted: he receives grant/research support from MedImmune, Inc.; is a speaker for MedImmune, Inc.; is an expert witness for Sanofi-Pasteur; and is an ad hoc consultant for GlaxoSmithKline, MedImmune, Inc., and Sanofi-Pasteur.

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## Viral Etiology and/or Eosinophilia May Determine Corticosteroid Efficacy in the Control of Wheezing

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following discharge, oxygen saturation during hospitalization, and duration of symptoms.

PDN did not influence time until ready for discharge. In secondary outcomes, PDN reduced the number of wheezing relapses during the subsequent 2-month period in children infected with RV (PDN vs placebo, 4 of 18 [22%] versus 9 of 16 [56%], OR=19.06; 95% CI 2.52-144.03;  $P=0.004$ ) but not in children infected with RSV (27% PDN vs 15% placebo; OR=0.34; 95% CI 0.056-2.03;  $P=0.23$ ). PDN was also effective in reducing relapses in children with eosinophil counts  $\geq 0.2 \times 10^9/L$  (PDN vs placebo, 5 of 21 [24%] versus 10 of 14 [71%], OR=10.57; 95% CI

1.99-56.22;  $P=0.006$ ) but not in children with counts  $< 0.2 \times 10^9/L$  (PDN vs placebo, 29% of patients versus 7%, OR=0.15; 95% CI 0.014-1.63;  $P=0.12$ ).

The authors contend their findings support the view that use of systemic corticosteroids at standard dosages is effective in the treatment of first- or second-time rhinovirus-induced wheezing illness with or without elevated blood eosinophil count.

Jartti T et al. Evaluation of the efficacy of prednisolone in early wheezing induced by rhinovirus or respiratory syncytial virus. *Pediatr Infect Dis J.* 2006;25:482-488.

### COMMENTARY

**H. CODY MEISSNER, MD, Chief Division of Pediatric Infectious Disease, Tufts-New England Medical Center, Boston, Massachusetts.**

*Corticosteroid therapy is used in up to 60% of infants and young children hospitalized in the United States with bronchiolitis. Corticosteroid use in bronchiolitis continues to occur despite the results of numerous randomized, placebo-controlled clinical trials that fail to show a benefit in terms of shorter length of stay or more rapid improvement of clinical score. Results from the study by Jartti et al suggest the number of wheezing relapses in rhinovirus-induced bronchiolitis were lower in corticosteroid-treated patients (4/18) than in placebo recipients (9/16). However, the number of subjects in either group was too small for any reasonable conclusion. Based on the available literature, corticosteroid therapy is not indicated for children with bronchiolitis.*

## Infection With Novel Coronavirus Strain HKU1, Associated With Community-Acquired Pneumonia, Elicits a High Incidence of Febrile Seizures

The identification of novel causative agents to explain the significant number of undiagnosed respiratory tract infections is an area of intense interest and research. Within the last 3 years, five novel agents have been identified: human metapneumovirus, human bocavirus\*, severe acute respiratory syndrome (SARS) coronavirus, human coronavirus NL63, and coronavirus HKU1. Three of these newly-identified agents are from the coronavirus group. The coronaviruses are classified into three groups based on serologic and phylogenetic criteria: group 1, which includes strains 229E and NL63; group 2, which includes strains OC43

and HKU1; and group 3, which includes the SARS coronavirus. Strains 229E and OC43 are known to account for 5% to 30% of human respiratory tract infections with strain NL63 present in less than 4% of respiratory specimens. Strain HKU1 is the most recently characterized of the coronavirus family and a recent study detected HKU1 in 2.4% of patients with community-acquired pneumonia. The clinical spectrum of illness associated with HKU1 and its epidemiology relative to other coronavirus strains is not clear. In a recently-published report of their prospective study, a group of Hong Kong-based investigators examined these questions for HKU1 and

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#### **PRCI MISSION STATEMENT**

The PRCI is a multicomponent educational program on pediatric respiratory disorders designed for pediatricians, primary care physicians, pediatric and family nurse practitioners, neonatologists, infectious disease specialists, allergists, pulmonologists, immunologists, and other healthcare professionals involved in the care and management of pediatric respiratory patients. PRCI programs address issues concerning asthma, respiratory syncytial virus, and other respiratory tract infections and disorders. Methods to prevent, control, and treat respiratory illnesses in children are also evaluated.

## **Infection With Novel Coronavirus Strain HKU1, Associated With Community-Acquired Pneumonia, Elicits a High Incidence of Febrile Seizures**

*Continued*

compared their findings with those obtained for NL63, OC43, and 229E strains in patients hospitalized for acute respiratory illness during a 1-year period.

Nasopharyngeal aspirates (NPAs) were collected from 4,181 patients with acute respiratory tract infections who were admitted to two public hospitals from April 2004 to March 2005. Corona-

viruses were detected using reverse transcriptase polymerase chain reaction (RT-PCR) with primers specific for each of the four coronavirus strains. Coronaviruses were detected in 2.1% of patients with OC43 being the most-detected strain (1.3%). Both HKU1 and NL63 had similar incidence (0.4% and 0.3%, respectively), while strain 229E was detected least often (0.1%). Of the patients with HKU1 infection,

approximately 85% (11/13) were children and 62% (8 patients) had underlying diseases. As would be expected with coronavirus infection, the most common presentation was upper respiratory infection. However, HKU1 infection was also associated with pneumonia, acute bronchiolitis, and asthmatic exacerbation. Importantly, although HKU1-associated fever was shorter in duration and exhibited no difference in maximum temperature when compared with

other strains or virus infections, children with HKU1 infection demonstrated a significantly higher incidence of febrile seizures (50% for HKU1 compared with 14% for OC43, 9% for adenovirus, 8% for respiratory syncytial virus, and none for strain 229E).

In contrast to infections due to strain NL63, which mainly occurred in early summer and autumn, both HKU1- and OC43-associated infections peaked in winter with some reports of HKU1 also occurring in spring to early summer. Based on nucleotide sequencing and phylogenetic analysis, two genotypes of HKU1 (A and B) were identified. Further investigation showed that, of the 13 previously-reported HKU1 isolates, 7 were type A and the remainder were type B.

The authors call for additional studies of

HKU1 infection in other areas to further understand the clinical spectrum of illness associated with this strain, as well as its geographic distribution.

Lau SKP et al. Coronavirus HKU1 and other coronavirus infections in Hong Kong. *J Clin Microbiol.* 2006;44:2063-2071.

\* See Arnold JC et al. *Clin Infect Dis.* 2006; 43: 283-288, for information pertaining to human bocavirus.

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In addition to regular issues of *Clinical Insights®* in *Pediatric Respiratory Care*, visit [www.freecme.com](http://www.freecme.com) and take the CME course **Managing the Treatment of RSV and Pediatric Influenza.**

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