Findings Predict Pneumonia Treatment Failure

BY MITCHEL L. ZOLER
Philadelphia Bureau

WASHINGTON — Five clinical findings at initial presentation in patients with severe, community-acquired pneumonia identified those who failed to respond to the first 3 days of antibiotic therapy in a study with 260 patients.

Prompt assessment of these five clinical flags may potentially distinguish patients who require close monitoring from those who face little risk from an early hospital discharge and oral antibiotic therapy, Martine Hoogewerf, M.D., said at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

But the prognostic value of these five findings requires validation in a larger group of patients before they can be used in routine practice, cautioned Dr. Hoogewerf, an infectious diseases specialist at the University Medical Center in Utrecht, the Netherlands.

The five findings were confusion, a gram-negative infection, an arterial pH of less than 7.35, an arterial oxygen pressure (PO_2) of less than 60 mm Hg, and a diagnosis of heart failure.

In a multivariate analysis of potential predictors of early treatment failure, these five parameters were associated with statistically significant differences in response. The first four factors identified patients with an increased risk of failure, while the presence of heart failure identified patients with a reduced risk.

Two possible explanations for the "protective" role of heart failure were that some patients with heart failure are mistakenly diagnosed with pneumonia, and when they actually have pneumonia, it more often has a viral etiology, Dr. Hoogewerf said. Among patients in the study, 68% of those with heart failure had no identified etiologic pathogen; among those without heart failure, 45% had no identified etiologic pathogen.

Dr. Hoogewerf and her associates converted their findings on predictive features into a scoring system. Based on the relative predictive value of these five clinical parameters, they created a scoring scheme for health care workers to use when first evaluating patients with severe, community-acquired pneumonia.

The system scores an arterial pH of less than 7.35 as 3 points, confusion as 2 points, a gram-negative infection as 2 points, an arterial PO_2 of less than 60 mm Hg as 2 points, and heart failure as –2 points.

Among the 260 patients in the study, 61% had a score of less than 2 points, and 18% of these patients had treatment failure after 3 days of antibiotic therapy. Another 35% of patients had a score of 2-4 points, and they had a treatment failure rate of 47%. The remaining 4% of patients had a score of 5 points or higher, and their failure rate was 80%, Dr. Hoogewerf said at the conference, sponsored by the American Society for Microbiology.

The study involved adults with community-acquired pneumonia seen at seven hospitals and medical centers in the Netherlands. All patients had either a pneumonia severity index score of more than 90 at their initial evaluation or met the criteria of the American Thoracic Society for severe pneumonia. All patients were started on antibiotic therapy and reassessed 3 days later.

A total of 80 patients (31%) had not responded to treatment after 3 days. The clinical importance of treatment failure at this time was documented by additional follow-up of all patients. The average hospital length of stay for patients who had early treatment success was 9.6 days, compared with an average length of stay of 13.4 days for the early treatment failures. The difference of 3.8 days is statistically significant.

In addition, patients with early treatment success had a 4.4% mortality rate by 28 days after the start of treatment. Patients who were early treatment failures had a 12% mortality rate 28 days after treatment started. The multivariate analysis of baseline parameters showed that patients with an arterial pH of less than 7.4 had a 4.46-fold increased risk of treatment failure, compared with patients whose arterial pH was at or above this cutoff. Patients who were confused had a 3.8-fold increased risk of failure, compared with those who were not confused.

Patients with a gram-negative infection had a 3.2-fold increased risk of treatment failure, compared with patients without an identified gram-negative infection. Patients with an arterial PO_2 of less than 60 mm Hg had a 77% increased risk of failure, compared with patients whose arterial PO_2 was at or above this cutoff. And patients with heart failure had a 68% reduced risk of treatment failure, compared with patients with no heart failure. ■

Keeping Score: Five Factors Predict Risk

Clinical Factor	Points
Arterial pH <7.35	+3
Confusion	+2
Gram-negative infection	+2
Arterial PO_2 <60 mm Hg	+2
Heart failure	–2

Source: Dr. Hoogewerf

New Coronavirus May Cause 9% of Children's Respiratory Infections

BY DOUG BRUNK
San Diego Bureau

A novel human coronavirus discovered by molecular testing in Connecticut may account for about 9% of respiratory tract infections in infants and young children.

The initial discovery is similar to that of a coronavirus identified by investigators in the Netherlands in 2004 (Proc. Natl. Acad. Sci. USA 2004;101:6212-6 and Nat. Med. 2004;10:368-73).

"Whether this virus is associated with other clinical syndromes remains to be determined," wrote the investigators, led by Frank Esper, M.D., of the department of pediatrics at Yale University, New Haven. "Population-based studies are required to define the burden of disease caused by this novel HCoV, and such studies could provide information on causality."

For the study, he and his associates developed PCR probes to target regions of the replicase 1a gene that are conserved among genetically diverse animal and human coronaviruses (J. Infect. Dis. 2005;191:492-8). They obtained specimens from the respiratory tracts of 895 children in the New Haven area who were less than 5 years old and who tested negative for common respiratory infections via direct fluorescent antibody assay. In the process, the investigators identified genomic sequences of a novel HCoV they called the New Haven coronavirus (HCoV-NH).

Of the 895 children 79 (8.8%) tested positive for HCoV-NH. Clinical data were available for 76 of the 79 children. Of these, 9 (11.8%) had evidence of a recent infection with another respiratory virus.

The most common clinical findings among the 67 children infected only with HCoV-NH were cough (64.2%), rhinorrhea (61.2%), tachypnea (58.2%), fever (47.8%), abnormal breathing sounds (44.8%), and hypoxia (37.3%).

A comparison of the HCoV-NH with the HCoV identified in the studies from the Netherlands "revealed that these viruses are closely related and likely represent the same species," the investigators observed.

They went on to conclude that the present study demonstrates "the power of the tools of molecular biology to define and characterize potential infectious agents associated with human disease."

In a related analysis, Dr. Esper and his associates conducted a case-control trial after one of the study participants—a 6-month-old infant with Kawasaki disease—tested positive for HCoV-NH. They studied respiratory specimens from 11 children with Kawasaki disease and 22 age-matched controls (J. Infect. Dis. 2005;191:499-502).

Of the 11 children with Kawasaki disease, nearly three-fourths (72.7%) tested positive for HCoV-NH compared with 1 child (4.5%) in the control group. That translated into a 16-fold risk of HCoV-NH infection among children with Kawasaki disease.

"Further studies—such as prospective cohort studies, seroepidemiological investigations, and investigations of inflamed tissue for the presence of the virus—are required to determine the precise role played by HCoV-NH in the pathogenesis of Kawasaki disease and to determine whether other infectious agents can also trigger this syndrome," the investigators concluded. ■

Malaria Web Site Offers Therapy Strategies and Telediagnosis

BY DAMIAN McNAMARA
Miami Bureau

MIAMI BEACH, FLA. — Want to confirm a suspected case of malaria?

You can e-mail a digital image to the Centers for Disease Control and Prevention for telediagnosis, and if necessary download guidelines for treatment from its new malaria Web site, Phuc Nguyen-Dinh, M.D., said at the annual meeting of the American Society of Tropical Medicine & Hygiene.

In less than 1 year, the CDC's online malaria initiative (www.cdc.gov/malaria) has supplanted many calls to the center's malaria hotline. Because malaria is relatively rare in the United States, with an estimated 1,200 cases identified per year, clinicians often need assistance in diagnosis and management. To that end, the CDC offers malaria publications, diagnostic reference services, and training seminars for laboratory personnel.

"Now information is downloadable from the Web site. We believe it is more accurate to print the guidelines than to get information over the telephone. Plus, with the Web site we can update the information as needed," said Dr. Nguyen-Dinh, medical officer in the division of parasitic diseases at the Centers for Disease Control and Prevention, Atlanta.

The response to the Web site has been positive, Dr. Nguyen-Dinh said. The clinical guidelines are especially useful, according to 430 physicians surveyed through the Infectious Diseases Society of America's Emerging Infections Network. The site features prevention information with a link to the CDC's travelers' information site. It also features interactive training for recognition of malaria.

"We know there is a need in the United States for better diagnosis," said Stephanie Johnson, MBA, CDC researcher in the Division of Parasitic Diseases. In 2002-2003, the CDC received 188 requests for telediagnosis, of which 79 were for suspected malaria. If the telediagnosis is malaria, the CDC requests the sender submit samples for verification.

Images of other suspected parasitic infections can be e-mailed to the CDC's Laboratory Identification of Parasites of Public Health Concern program (www.dpd.cdc.gov/dpdx). ■

The CDC malaria hotline, 770-488-7788, operates Monday through Friday, 8 a.m. to 4:30 p.m. EST; the after-hours emergency number is 770-488-7100.