Adenovirus 14 Caused Outbreak of Severe CAP

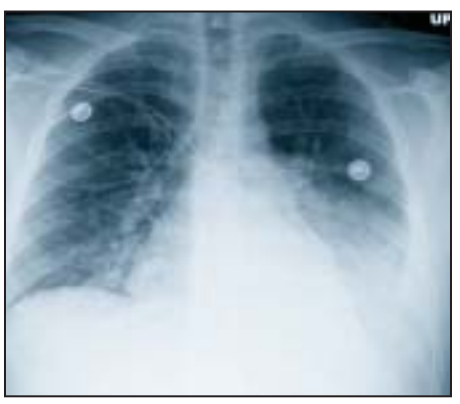
BY DOUG BRUNK
San Diego Bureau

SAN DIEGO — During the winter of 2006 and the spring of 2007, adenovirus 14 caused a community outbreak of respiratory disease in Oregon, with a fatality rate of 19%, Dr. Paul Lewis reported at the annual meeting of the Infectious Diseases Society of America.

"This seemed to come out of nowhere," Dr. Lewis, a public health physician with the state of Oregon and a pediatric infectious disease physician with Oregon Health and Science University, Portland, said of the outbreak. "In patients with serious respiratory illness without an identified etiology, clinicians should think about viruses."

The cluster was first identified in the spring of 2007 by his associate, Dr. David Gilbert, who was making rounds in the intensive care unit at Providence Portland Medical Center and thought it was odd that 4 of 13 patients had adenovirus infections, which are typically mild and self-limited.

"When we called other hospitals in the Portland area, we almost fell out of our chairs because they all had seen recent severe and fatal cases of adenovirus," Dr. Lewis said.



Lobar consolidation is shown in a patient on day 1 of hospitalization.

The same patient is shown above on day 4 of hospitalization.

PHOTOS COURTESY DR. PAUL LEWIS

The researchers studied 45 cases of adenovirus that were detected in Oregon medical laboratories between November 2006 and April 2007. The adenovirus isolates were typed by hexon gene sequencing or by a novel adenovirus 14–specific real-time polymerase chain reaction assay.

More than 75% of all adenovirus cases were in male patients. Of the 45 cases, 31 (69%) were adenovirus 14, a serotype first identified in 1953 but seen infrequently and never in outbreaks since that time.

Patients infected with adenovirus 14 were significantly older than patients infected with other adenovirus isolates (a mean of 59 years vs. 1 year, respectively). They also had significantly higher rates of hospitalization (71% vs. 14%, respectively).

Clinical features of patients with adenovirus 14 included fever (84%), tachypnea (77%), hypoxia (48%), and hypotension (43%). Of the 24 chest x-rays obtained, 21 (88%) had abnormal findings. Lobar consolidation was the most common pattern seen.

Dr. Lewis reported that 22 (71%) of the adenovirus 14 patients required hospitalization, and 6 (19%) died. Of the hospitalized patients, 16 (73%) required ICU care, 13 (59%) required mechanical ventilation, and 8 (36%) required blood pressure support with vasopressors.

"Infection control was a great concern to hospitals that saw multiple cases," Dr. Lewis said. "Many patients were isolated with [severe acute respiratory syndrome]–like precaution. There was a health care worker at an ICU taking care of one of these patients who was subsequently admitted to that ICU with adenovirus 14," he added. "That's our only known possible case of transmission, but we cannot be sure it was not acquired in the community."

Treatment included "lots of empiric antibiotics." Cidofovir was used in six patients, two of whom died.

Dr. Lewis said that there are 51 known adenovirus serotypes. Types 1, 2, and 5 are nearly universal in children, whereas types 3, 4, and 7 are common in adults. No adenovirus vaccine is currently available in the United States, and previous vaccines developed for the military do not cover adenovirus 14.

He acknowledged certain limitations of the study, including its retrospective design and the potential for testing bias. ■

Assessment Tool Offers Insight Into Pneumonia Severity

BY PATRICE WENDLING
Chicago Bureau

CHICAGO — A simple severity-assessment tool for community-acquired pneumonia accurately identified patients needing intensive respiratory or inotropic support in a 7,464-patient, multicenter validation study.

SMART-COP was developed as part of the Australian Community-Acquired Pneumonia (CAP) study and measures eight features readily available at the time of initial assessment: low systolic blood pressure (less than 90 mm Hg), multilobar chest x-ray involvement, low albumin level (less than 3.5 g/dL), high respiratory rate (age-adjusted cutoffs), tachycardia (at least 125 beats per minute), confusion (new onset), poor oxygenation (age-adjusted cutoffs), and low arterial pH (less than 7.35).

A modified version for primary care physicians, called SMRT-CO, does not require the results of investigations such as serum albumin, arterial pH, and arterial oxygen tension.

For SMART-COP and SMRT-CO, the cutoff scores for increased risk of needing intensive respiratory or inotropic support (IRIS) are at least three points and at least two points, respectively, Dr. Patrick G.P. Charles of the department of infectious diseases, Austin Health, Heidelberg, Australia, and his associates reported in a late-breaking poster at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

The investigators calculated the area under the receiver operating characteristic (ROC) curve and the Hosemer-Lemeshow goodness-of-fit statistic to determine the ability of SMART-COP to predict the need for IRIS among 7,464 patients from five CAP databases, including 474 patients who needed IRIS. The patients' mean age was 65 years (range 18-100 years).

Sensitivity and specificity for SMART-COP in each of the five databases were 80% and 61%, 58% and 75.5%, 69% and 73%, 86% and 73%, and 89% and 46%, respectively. For SMRT-CO, those results were 86% and 51%, 71% and 59%, 81% and 58%, 85% and 55%, and 95% and 36%, respectively. This high accuracy was found even though it wasn't possible in most cases to assess the lower cutoff values for respiratory rate and oxygenation in patients aged 50 years or younger, the investigators reported at the meeting sponsored by the American Society for Microbiology.

Some databases didn't record actual values, but simply noted whether, for example, the respiratory rate was 30 breaths or more per minute. In the SMART-COP model, the cutoff is at least 25 breaths per minute for patients aged 50 years or less, and at least 30 breaths per minute for those older than 50.

Without the actual value for each test, the missing data were assumed to be normal, and no points could be assigned, Dr. Charles explained in an interview. He said it is difficult to know exactly how many data points were missing, but noted that albumin level and arterial blood gases were not recorded in about 4,500 patients.

"Based on this, it is very likely that the SMART-COP scores given to many patients were inappropriately low, making the sensitivity figures look lower than they probably should be if complete data were available," Dr. Charles said. "A prospective study is planned, which should answer this." ■

Pneumonia Patients Admitted Late To ICU Have Higher Mortality

SAN FRANCISCO — Patients with community-acquired pneumonia who were admitted to the intensive care unit 2 or more days after diagnosis were more than twice as likely to die within 30 days as were those who were admitted in 24 hours or less, according to a poster presentation at the International Conference of the American Thoracic Society.

The retrospective, observational study involved 161 patients seen over a 3-year period at two tertiary care hospitals in San Antonio. All patients were 18 years old or older, all had received a chest x-ray within 24 hours of admission, and all had a diagnosis consistent with community-acquired pneumonia, wrote Dr. Marcos I. Restrepo and his colleagues at the University of Texas at San Antonio.

There were no significant differences in demographic or clinical characteristics between the 142 patients admitted to the ICU early and the 19 admitted late. There were also no significant differences between the two groups in whether they received antibiotics within 4 hours, whether their blood was cultured appropriately, or whether they received guideline-concordant antibiotic therapy.

After 30 days, 47% of the patients who had been admitted late had died, compared with 23% of the patients who had been admitted early, a significant difference.

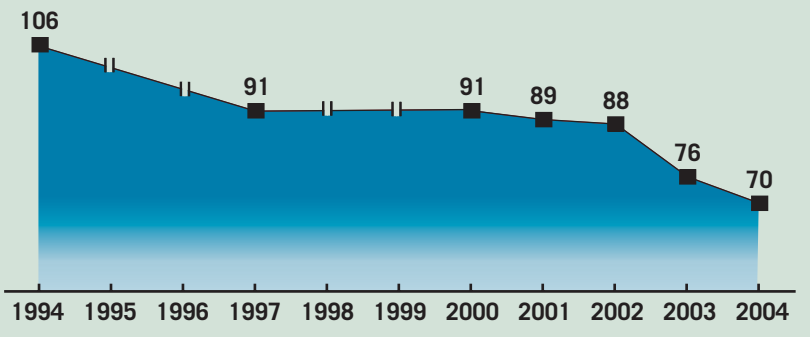
The investigators wrote that further research is needed to isolate the factors underlying the association between late ICU admission and increased mortality.

—Robert Finn

DATA WATCH

Inpatient Mortality from Pneumonia Declining

(per 1,000 admissions)



Source: Healthcare Cost and Utilization Project

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