Chlamydial Pneumonia and Asthma: A Potentially Important Relationship

In this issue of *JAMA*, Hahn et al[1] document an interesting relationship between chlamydial pneumonia and asthma in adults using a matched comparison method. These investigators found that patients with serologically confirmed *Chlamydia pneumoniae* infection (antibody titers greater than 1:64) were much more likely to develop bronchial asthma subsequent to their chlamydial infection than were seronegative patients (antibody titers less than 1:16). Nearly 30% of the *Chlamydia*-exposed (seropositive) patients were later diagnosed as having asthmatic bronchitis, whereas only 7% of unexposed (seronegative) patients received the same diagnosis in the 6-month period after their respiratory illness.

See also p 225.

The context for this finding is a trend toward increasing incidence, morbidity, and mortality attributable to asthma—despite advances in diagnosis and treatment. During the 1980s, statistics relating to asthma showed distinct increases in mortality in the United States and in most industrialized countries.[2,3] Furthermore, a recent article demonstrated changing hospitalization patterns among children with asthma over the same time period.[4]

Possible explanations for these observations include the following: (1) reflection of a true increase in asthma prevalence and incidence; (2) increasing numbers within the pool of genetically susceptible individuals; (3) increased survival of infants and children with severe respiratory impairment; (4) increased documentation and case findings; (5) increasing problems with access to medical care, especially for indigent patients; and (6) artifactual reasons (diagnosing asthma in patients in whom it was not previously diagnosed or in those who may have been diagnosed as having a different condition).[5]

In a 1990 review of asthma mortality in the United Kingdom, Higenbottam and Hay[6] showed that, although the incidence and mortality of asthma have both been on the rise, increases in the mortality rate have been significantly slower. The mortality rate per asthma patient, therefore, has declined. The same authors showed, however, that among asthma patients admitted to the hospital for an acute asthma attack, nearly two thirds had previously been prescribed treatment for the inflammatory component (aerosol corticosteroids and cromolyn) seen with asthma, yet only one third of these patients (18% with a diagnosis of acute asthma on hospital admission) had been compliant with their therapeutic regimen!

The effect of exposure to environmental allergens or pollutants may be of great importance in the increased incidence of asthma. Decreasing the levels of such allergens or pollutants should result in a reduction of airway inflammation and airway hyperresponsiveness. This was shown in children sensitive to house dust mites where treatment in the mite-free environment of the Swiss Alps resulted in improvement.[7,8] The importance of the effects of inhaled allergens, especially house dust mites, on airway responsiveness to inhaled histamine has been examined in several studies.[9-11] However, the result of environmental control is not rapid and may take weeks to occur. Reports on occupational asthma are similar but show an even longer time lag between treatment and improved airway response, sometimes requiring avoidance of allergen exposure for several months.[12]

The situation, however, appears to be even more complicated. In a 1991 review of 11 cases of respiratory arrest in asthma patients, 10 (91%) of the 11 patients had positive skin-puncture tests for sensitivity to the mold *Alternaria alternata* spores, and serum IgE antibodies to the mold were elevated in all nine of the patients tested (two of the patients died in respiratory arrest).[13] These results, in comparison with 99 matched control patients with asthma who had no history of respiratory arrest (31% sensitivity by skin-puncture test), led the authors to conclude that there was an approximately 200-fold increase in the risk of respiratory arrest among children and young adults exposed to *A alternata*.

Since recent investigations have disclosed that as many as 50% of all adults worldwide may be seropositive for *C pneumoniae* antibodies,[14] the results of Hahn et al may provide one more explanation for the increased incidence of asthma. Furthermore, as the authors articulate, *C pneumoniae* may prove to be an important preventable cause of adult-onset asthma. Such studies may help to unravel the mystery surrounding the increased incidence and mortality recently seen from asthma.

Roger C. Bone, MD

1. Hahn DL, Dodge RW, Golubjatnikov R. Association of *Chlamydia pneumoniae* (strain TWAR) infection with wheezing, asthmatic bronchitis, and adult-onset asthma. *JAMA*. 1991;266:225-230.
2. Evans R, Mullally DI, Wilson RW, et al. National trends in the morbidity and mortality of asthma in the US: prevalence, hospitalization and death from asthma over two decades: 1965-1984. *Chest*. 1987;91:655-745.
3. Sly RM. Mortality from asthma. *J Allergy Clin Immunol*. 1989;84:421-434.
4. Gergen PJ, Weiss KS. Changing patterns of asthma hospitalization among children: 1979 to 1987. *JAMA*. 1990;264:1688-1692.
5. Buist AS. Asthma mortality: what have we learned? *J Allergy Clin Immunol*. 1989;84:275-283.
6. Higenbottam T, Hay I. Has the treatment of asthma improved? *Chest*. 1990;98:706-712.
7. Kerrebijn KF. Endogenous factors in childhood CNSLD. In: Orie NGM, Van der Lende R, eds. *Bronchitis III*. Assen, the Netherlands: Van Gorcum; 1970:38-48.
8. Platts-Mills TAE, Chapman MD. Dust mites: immunology, allergic disease, and environmental control. *J Allergy Clin Immunol*. 1987;80:755-775.
9. Dorward AJ, Colloff MJ, MacKay NS, McSharry C, Thomson NC. Effect of house dust mite avoidance measures on adult atopic asthma. *Thorax*. 1988;43:98-102.
10. Murray AB, Ferguson AC. Dust-free bedrooms in the treatment of asthmatic children with house dust or house dust mite allergy: a controlled trial. *Pediatrics*. 1983;71:418-422.
11. Platts-Mills TAE, Mitchell EB, Nock P, Tovey ER, Moszoro H, Wilkins SR. Reduction of bronchial hyperreactivity during prolonged allergen avoidance. *Lancet*. 1982;2:675-678.
12. Lam S, Wong R, Yeung M. Nonspecific bronchial reactivity in occupational asthma. *J Allergy Clin Immunol*. 1979;63:23-34.
13. O'Hollaren MT, Yunginger JW, Offord KP, et al. Exposure to an aeroallergen as a possible precipitating factor in respiratory arrest in young patients with asthma. *N Engl J Med*. 1991;324:359-363.
14. Grayston JT, Wang S-P, Kuo C-C, Campbell LA. Current knowledge on *Chlamydia pneumoniae*, strain TWAR, an important cause of pneumonia and other acute respiratory diseases. *Eur J Microbiol Infect Dis*. 1989;8:191-202.

From the Section of Pulmonary Medicine, Rush-Presbyterian-St Luke's Medical Center, Chicago, Ill.
Reprint requests to Section of Pulmonary Medicine, Rush-Presbyterian-St Luke's Medical Center and Rush Medical College of Rush University, 1653 W Congress Pkwy, Chicago, IL 60612 (Dr Bone).