The Presence of Rhinovirus in Lower Airways of Patients With Bronchial Asthma

Wos M, Sanak M, Soja J, Olechnowicz H, Busse WW, Szczeklik A. Am J Respir Crit Care Med. 2008;177(10):1082–1089

PURPOSE OF THE STUDY. To determine if there was identifiable rhinovirus in the bronchi of stable asthmatic subjects and whether there is a difference in the prevalence of bronchial rhinovirus in asthmatic subjects versus nonasthmatic controls.

STUDY POPULATION. Adult asthmatic subjects having bronchoscopy for clinical indications were enrolled if they had a forced expiratory volume in 1 second of <80% of predicted and had >12% improvement with bronchodilator or airway hyperreactivity to methacholine. Subjects must have had stable symptoms for at least 2 weeks and no upper airway infection in the previous 3 weeks. Control subjects were nonasthmatic patients who were undergoing diagnostic bronchoscopy for symptoms such as dyspnea, hemoptysis, or tumor or having lobectomy or pulmonectomy for tumor. Controls must not have had upper airway infection within 3 weeks.

METHODS. Mucosal biopsies and lung tissue samples were analyzed by immunohistochemical staining using monoclonal antibody to rhinovirus and by in situ reverse-transcription polymerase chain reaction to identify rhinoviral RNA.

RESULTS. Immunochemical staining showed rhinovirus in 64% (9 of 14) of the bronchial biopsies from asthmatic subjects and in 33% (2 of 6) of the controls. With the polymerase chain reaction method, 73% of biopsies from asthmatic subjects and 22% of the controls had evidence of rhinovirus RNA. Asthmatic subjects who tested positive for rhinovirus had worse pulmonary function and increased serum and tissue eosinophilia and increased tissue leukocytes compared with subjects in the virus-negative group.

CONCLUSIONS. Rhinovirus is more often present in the lower airways of asthmatic patients, and its presence is associated with worse lung function and increased eosinophilic inflammation.

Childhood Asthma After Bacterial Colonization of the Airway in Neonates


PURPOSE OF THE STUDY. To investigate a possible association between bacterial colonization of the hypopharynx in asymptomatic neonates and later development of recurrent wheeze, asthma, and allergy during the first 5 years of life.

STUDY POPULATION. The subjects were children from the Copenhagen Prospective Study on Asthma in Childhood who were born to mothers with asthma. Samples were obtained from 321 subjects at the age of 1 month when the infants were asymptomatic.

METHODS. Aspirates from the hypopharyngeal region were cultured for Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, and Staphylococcus aureus. Wheeze was monitored prospectively on diary cards during the first 5 years of life. Peripheral eosinophil count, total immunoglobulin E (IgE) levels, and specific IgE levels were measured at 4 years of age. Lung function was measured and asthma was diagnosed at the age of 5.

RESULTS. Overall, 21% of the infants were colonized with S pneumoniae, M catarrhalis, H influenzae, or a combination of these organisms. Colonization with ≥1 of these organisms, but not S aureus, was significantly associated with persistent wheeze, acute severe exacerbation of wheeze, and hospitalization for wheeze. Eosinophil counts and total IgE levels at age 4 were significantly increased in children colonized at age 1 month with S pneumoniae, M catarrhalis, or H influenzae, but the specific IgE level was not significantly affected. Children who had been colonized neonatally with S pneumoniae, M catarrhalis, or H influenzae also had, at age 5, increased prevalence of asthma, increased risk for hospitalization for wheeze, and increased reversibility of airway resistance after the administration of a bronchodilator.

CONCLUSIONS. Neonates colonized in the hypopharyngeal region with S pneumoniae, M catarrhalis, H influenzae, or a combination of these organisms are at increased risk for recurrent wheeze and asthma early in life.
The Presence of Rhinovirus in Lower Airways of Patients With Bronchial Asthma

Larry W. Williams

Pediatrics 2008;122;S206
DOI: 10.1542/peds.2008-2139

Updated Information & Services
Including high resolution figures, can be found at:
/content/122/Supplement_4/S206.1

Subspecialty Collections
This article, along with others on similar topics, appears in the following collection(s):
Allergy/Immunology
/cgi/collection/allergy:immunology_sub
Asthma
/cgi/collection/asthma_sub

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
/site/misc/Permissions.xhtml

Reprints
Information about ordering reprints can be found online:
/site/misc/reprints.xhtml

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.
The Presence of Rhinovirus in Lower Airways of Patients With Bronchial Asthma

Larry W. Williams

Pediatrics 2008;122;S206
DOI: 10.1542/peds.2008-2139BBB

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/122/Supplement_4/S206.1