Microbial Interactions during Upper Respiratory Tract Infections

Melinda M. Pettigrew, Jananne F. Gent, Krystal Revi, Janaka A. Patel, and Tanase Chonmaitree

ACTIVITY

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Learning Objectives

Upon completion of this activity, participants will be able to:

- Identify common bacterial isolates from children with upper respiratory infections
- Specify host/external interactions between colonizing bacteria during upper respiratory infections
- Identify variables associated with higher rates of colonization with S. pneumoniae
- Specify which bacterial co-infectors in the nasopharynx may negatively impact H. influenzae

S. pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, and Staphylococcus aureus often colonize the nasopharynx. Children are susceptible to bacterial infections during or soon after upper respiratory tract infection (URTI). We describe interactions with these 4 bacteria species alone or in combination during URIs. Data were from a prospective cohort of healthy children 2 to 30 months of age followed up for 1 year. Analyses of 985 awashes from 272 children indicated that S. pneumoniae colonization is negatively associated with colonization by H. influenzae. Competitive interactions shifted when H. influenzae and M. catarrhalis colonized together. In this study, the relationship of children with 5 or more negative associations were identified between S. pneumoniae and S. aureus. S. pneumoniae and M. catarrhalis. Polymicrobial interactions differed by number and species of bacteria present. Antibiotic therapy and vaccination strategies targeting specific bacterial species may alter the flora of the nasopharynx.

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S. pneumoniae, H. influenzae, and M. catarrhalis are the 3 most common causative agents of pneumonia in young children. S. pneumoniae is also common causes of pneumonia, sepsis, and meningitis in young children. The proportion of young children colonized with any of these 3 bacteria species can be ~70% in some populations (4–8). S. aureus strains colonize up to 35% of young children and are associated with a wide range of infections including soft tissue infections, sepsis, and pneumonia (9,10). Increases in the incidence of disease caused by community-acquired methicillin-resistant S. au-

The activity supported the learning objectives.

A. Staphylococcus aureus
B. Moraxella catarrhalis
C. Haemophilus influenzae
D. Streptococcus pneumoniae

2. Which of the following associations between bacteria in the current study is most accurate?

A. Colonization with H. influenzae was positively associated with S. pneumoniae colonization
B. Colonization with M. catarrhalis was positively associated with S. pneumoniae colonization
C. Colonization with S. pneumoniae was positively associated with M. catarrhalis colonization
D. Colonization with H. influenzae and M. catarrhalis was positively associated with S. pneumoniae colonization

Earning CME Credit

To obtain credit, you should read the entire article. After reading the article, you should be able to answer the following questions, related, multiple-choice questions. To complete the questions and earn continuing medical education (CME) credit, please go to http://www.medscape.com/cme/vid. Credit cannot be obtained for tests completed on paper, although you may use the worksheet below to keep a record of your answers. You must be registered on Medscape.com, please click on the New Users Registration Link on the left hand side of the website to register. Only one answer is correct for each question. Once you successfully answer all post-test ques-

A. Antibiotic use in the past 3 days
B. Younger age
C. Upright vaccination with pneumococcal vaccine (PCV7)
D. Breast-feeding

4. A day care promoted colonization with which of the following bacteria?

A. S. aureus
B. M. catarrhalis
C. H. influenzae
D. S. pneumoniae

5. The activity supported the learning objectives.

Strongly Agree
Strongly Disagree