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Effect of pneumococcal conjugate vaccine on nasopharyngeal bacterial colonization during acute otitis media

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Abstract

The heptavalent pneumococcal conjugate vaccine (PCV7) has been shown to reduce the incidence of acute otitis media (AOM) caused by Streptococcus pneumoniae by 34% and reduces the overall incidence of AOM by 6% to 8%. More recent studies have shown increases in the proportion of Haemophilus influenzae and Moraxella catarrhalis in the middle-ear fluid of PCV7-immunized children. There has been no report on the effect of PCV7 on all 3 bacterial pathogens combined, either in the middle-ear fluid or nasopharynx of individual children with AOM. We investigated the impact of PCV7 on nasopharyngeal colonization with bacterial pathogens during AOM in the pre-PCV7 and post-PCV7 vaccination eras. Four hundred seventeen children (6 months to 4 years of age) were enrolled onto AOM studies between September 1995 and December 2004. Of these, 200 were enrolled before the vaccine use (historical controls), and 217 were enrolled after the initiation of PCV7 vaccination (101 were underimmunized, and 116 were immunized). Although the nasopharyngeal colonization rate for S pneumoniae was not different between the 3 groups, a significantly higher proportion of PCV7-immunized children with AOM were colonized with M catarrhalis. Overall, the mean number of pathogenic bacteria types isolated from immunized children (1.7) was significantly higher than in controls (1.4). The increase in bacterial colonization of the nasopharynx during AOM could be associated with an increase in AOM pathogens and theoretically can predispose PCV7-immunized children with AOM to a higher rate of antibiotic treatment failure or recurrent AOM.