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JAMA. 2007 Apr 25;297(16):1784-92.

Invasive pneumococcal disease caused by nonvaccine serotypes among alaska native children with high levels of 7-valent pneumococcal conjugate vaccine coverage.

Singleton RJ, Hennessy TW, Bulkow LR, Hammitt LL, Zulz T, Hurlburt DA, Butler JC, Rudolph K, Parkinson A.

Arctic Investigations Program, National Center for Preparedness Detection and Control of Infectious Diseases, Centers for Disease Control and Prevention, Anchorage, Alaska, USA.

Abstract

CONTEXT: With routine childhood vaccination using heptavalent pneumococcal conjugate vaccine, one concern has been the potential for emergence and expansion of replacement disease caused by serotypes not contained in the heptavalent conjugate vaccine.

OBJECTIVE: To determine whether replacement disease is associated with the overall decline in invasive pneumococcal disease among Alaska Native children.

DESIGN, SETTING, AND PATIENTS: Alaska statewide longitudinal population-based laboratory surveillance of invasive *Streptococcus pneumoniae* infections from January 1, 1995, through December 31, 2006.

MAIN OUTCOME MEASURES: Incidence and types of pneumococcal disease in children younger than 2 years.

RESULTS: In the first 3 years after introduction of routine vaccination with heptavalent pneumococcal conjugate vaccine, overall invasive pneumococcal disease decreased 67% in Alaska Native children younger than 2 years (from 403.2 per 100,000 in 1995-2000 to 134.3 per 100,000 per year in 2001-2003, $P < .001$). However, between 2001-2003 and 2004-2006, there was an 82% increase in invasive disease in Alaska Native children younger than 2 years to 244.6/100,000 ($P = .02$). Since 2004, the invasive pneumococcal disease rate caused by nonvaccine serotypes has increased 140% compared with the prevaccine period (from 95.1 per 100,000 in 1995-2000 to 228.6 in 2004-2006, $P = .001$). During the same period, there was a 96% decrease in heptavalent vaccine serotype disease. Serotype 19A accounted for 28.3% of invasive pneumococcal disease among Alaska children younger than 2 years during 2004-2006. There was no significant increase in nonvaccine disease in non-Native Alaska children younger than 2 years.

CONCLUSIONS: Alaska Native children are experiencing replacement invasive pneumococcal disease with serotypes not covered by heptavalent pneumococcal conjugate vaccine. The

demonstration of replacement invasive pneumococcal disease emphasizes the importance of ongoing surveillance and development of expanded valency vaccines.

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PMID:17456820[PubMed - indexed for MEDLINE]

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