

Continued from previous page

ilar conclusions regarding serotype changes after PCV7: Rates of invasive disease caused by antibiotic-resistant bacteria have declined, but rates of resistant disease caused by 19A increased by 238% from 1999 to 2004. The study also found modest increases in invasive disease caused by resistant strains not included in the vaccine (N. Engl. J. Med. 2006; 354:1455-63).

“The increase in resistant disease caused by serotype 19A is a concern,” said Dr. Kyaw, of the Centers for Disease Control and Prevention, and his colleagues. “It is difficult to predict whether the increase in resistant serotype 19A or other serotypes not covered by the vaccine will continue. Nevertheless, this replacement disease has the potential to reduce the overall benefit of the vaccine against resistant infections.”

Replacement disease with resistant strains, particularly 19A, is a surprise—and not a nice one, Dr. Daniel M. Musher said in an accompanying editorial. “This problem is compounded by the fact that,

through genetic transformation, pneumococci can switch capsules.” If pneumococcal strains with pandemic potential, such as 6B, 9V, or 23F, acquire a resistant capsule, dangerous new types could emerge.

There is insufficient information to make any predictions about the endemic spread of these replacement serotypes, Dr. Boulton said. “We have seen only cases of disease being caused by these replacement strains, but that’s all. It would be a very different situation if we begin to see levels of transmission comparable to what was seen in the serotypes included in the vaccine.” ■

## Pneumococcal Vaccine Stops hMPV Infection

Children vaccinated with three doses of pneumococcal conjugate vaccine had a reduced rate of human metapneumovirus-associated infections of the lower respiratory tract, as well as a lower rate of clinical pneumonia than children given placebo, researchers reported.

Dr. Shabir A. Madhi of the University of the Witwatersrand, Bertsham, South Africa, and colleagues performed an analysis of data from nearly 40,000 children—some of whom had been infected with HIV—who had been given three doses of a polysaccharide-protein conjugate vaccine (PCV) or placebo in an ongoing phase III study.

Dr. Madhi and coinvestigators tested nasopharyngeal aspirate samples of the children who had been hospitalized with lower respiratory tract infection (LRTI) for evidence of human metapneumovirus (hMPV), which was discovered only 5 years ago, as well as for HIV and C-reactive protein (J. Infect. Dis 2006;193:1236-43).

They found that for vaccinated children without HIV infection, the hospitalization rate was 46% lower than that of children who received placebo. For HIV-infected children, the reduction was 53% versus placebo. The incidence of clinical pneumonia also was reduced for both HIV-free and HIV-infected children who received vaccine (55% and 65%, respectively).

These results “suggest that bacterial coinfections, particularly pneumococcal infections, are an essential part of the pathogenesis of most severe hMPV infections progressing to pneumonia,” they said. This means that children hospitalized with hMPV-associated pneumonia “should be treated with antibiotics.”

—John R. Bell

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