Rotavirus Hospitalizations Drop 84% in 3 Years

BY MIRIAM E. TUCKER

BALTIMORE — Rotavirus hospitalizations declined by 84% from 2006 to 2008 among children less than 3 years of age, suggesting a dramatic effect of vaccination.

That degree of decline was seen even among children 2-3 years old whose age made them ineligible to be vaccinated against rotavirus, suggesting that the vaccine's impact extends beyond direct vaccinees, Daniel C. Payne, Ph.D., said at the annual meeting of the Pediatric Academic Societies.

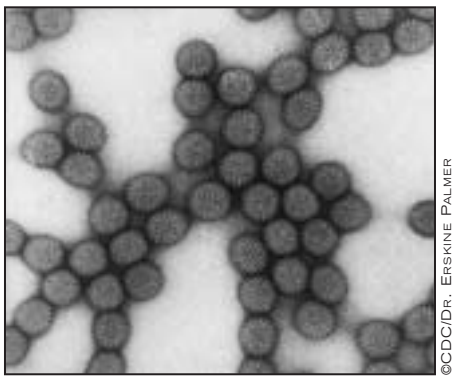
Dramatic decreases in rotavirus hospitalization rates were observed in 2008, compared with the pre-vaccine licensure year 2006. "Rotavirus hospitalization rate decreases were much greater than would be expected based on vaccine coverage," said Dr. Payne of the Centers for Disease Control and Prevention, Atlanta.

The findings come from the New Vaccine Surveillance Network (NVSN), a systematic, prospective, population-based surveillance network for acute gastroenteritis in three U.S. counties with a combined catchment of approximately 85,000 children less than 3 years of age. Funded by the CDC, the NVSN allows for direct estimates of the rotavirus disease burden in each participating hospital.

Children less than 3 years of age who resided in specific counties in Tennessee, Ohio, and New York were eligible for enrollment if they had acute gastroenteritis (AGE), defined as three or more episodes of diarrhea and/or any vomiting in a 24-hour period. Surveillance was conducted during January to June of 2006, 2007, and 2008.

Stool samples were collected from 499 of 578 eligible children. The proportion of hospitalized children with AGE who tested positive for rotavirus dropped from 50% in 2006 (91 of 181) to 45% in 2007 (81 of 179) and then down to just 6% (9 of 139) in 2008. "This is a major, major decline in incidence, using the same [testing] methodology for all 3 years," Dr. Payne commented.

At one site, Rochester, N.Y., there wasn't a single hospitalization for rotavirus gastroenteritis during 2008 in a catchment area of 28,000 children less than 3 years of age, he noted. Broken down by age, there was a 66% decline in rotavirus hospitalizations among children less than 1 year of age from 2006 to 2008, during which time vaccine coverage (defined as receipt of at least one of the three doses) increased from less than 1% to 56%. For children aged 1-2 years, there was a 95% decline over the 3 years, concurrent with a rise in vaccine coverage from 0% to 44%.



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There was a major decline in incidence of rotavirus causing AGE hospitalizations.

The most startling finding, however, was an 85% decline in rotavirus hospitalizations among 2- to 3-year-olds, who were age ineligible to receive the vaccine, with vaccination rates less than 1% in 2008. "It looks like a disproportionate effect," Dr. Payne commented, adding that " this raises a previously unpredicted question: Are there indirect benefits—herd immunity—from rotavirus vaccine?"

"Clinical trials of the vaccine did not evaluate herd immunity. … This is certainly something we're looking at further," he said.

In response to an audience member's question about cost effectiveness, Dr. Payne said that if the 84% decline in hospitalizations seen in these three surveillance sites were extrapolated to the entire country, it would mean 22,000 fewer hospitalizations and 300,000 fewer emergency department visits within a 1-year period. Cost effectiveness hasn't yet been analyzed, but "it's something that will be important to look at."

Dr. Payne stated that he had no financial conflicts of interest to report. ■