

CDC study affirms benefits of routine rotavirus vaccination

by **Jane Seward, M.B.B.S., M.P.H., FAAP,**
and **Umesh Parashar, M.B.B.S., M.P.H.**

A new study from the Centers for Disease Control and Prevention (CDC) shows that routine vaccination of U.S. infants against rotavirus has dramatically reduced hospitalizations, emergency department (ED) visits and doctor visits for diarrhea-related illness in young children. In turn, this has led to substantial savings in treatment costs (*N Engl J Med.* 2011;365:1108-1117, www.nejm.org/doi/full/10.1056/NEJMoa1000446).

Before the RotaTeq and Rotarix vaccines were introduced in the United States in 2006, rotavirus was responsible for about 400,000 visits to doctors' offices, 200,000 ED visits, 55,000 to 70,000 hospitalizations, and 20 to 60 deaths each year in children younger than 5 years old. In pre-licensure studies, RotaTeq and Rotarix were 85% to 98% effective at preventing severe rotavirus disease in clinical trials in middle- and high-income countries, including the United States.

The CDC used health insurance claims data from 2001 to 2009 for about 2 million U.S. children under 5 years old to assess coverage of rotavirus vaccine and the effect on health care visits and treatment costs for diarrhea-related illness. Researchers examined both direct benefits to vaccinated children and indirect protective benefits to unvaccinated children. They estimated national declines in diarrhea-associated hospitalizations and treatment costs by extrapolating data from this study to the U.S. population of children under 5 years old.

Vaccine coverage

By the end of 2008, at least one dose of rotavirus vaccine had been given to 73% of children under 1 year of age, 64% of 1-year-olds and 23% of 2- to 4-year-olds.



AAP News photo by Jeff Knox

About 20 to 60 U.S. children under age 5 died every year from rotavirus before RotaTeq and Rotarix were introduced in 2006.

Decrease in health care use

Compared with pre-vaccine years (2001 to 2006), hospitalization rates for rotavirus-related illness in children under 5 years old decreased substantially — 75% decline for 2007-'08 and 60% decline for 2008-'09.

Compared with pre-vaccine years, hospitalization rates during 2007-'08 decreased 72% even among children 2-4 years old with negligible vaccine coverage, suggesting indirect protection from the rotavirus vaccination program.

During the 2008 and 2009 rotavirus seasons (January to June), vaccinated children had 89% fewer

hospitalizations for rotavirus-related illness and 44% to 58% fewer hospitalizations for diarrhea from any cause compared with unvaccinated children. Also, vaccinated children had 37% to 48% fewer ED visits and 9% to 12% fewer outpatient visits for diarrhea-related illness compared with unvaccinated children.

Reduction in hospitalizations, cost savings

For the two-year period from 2007 to 2009, an estimated 65,000 hospitalizations of U.S. children under 5 years old were averted, and about \$278 million in health care costs were saved as a result of rotavirus vaccination.

Dr. Seward is a CDC liaison to the AAP Committee on Infectious Diseases and deputy director, Division of Viral Diseases (DVD), National Center for Immunization and Respiratory Diseases (NCIRD), CDC. Dr. Parashar is a medical epidemiologist and team leader for the Viral Gastroenteritis Team, DVD, NCIRD, CDC.

RESOURCES

- For information on rotavirus, visit www.cdc.gov/rotavirus/index.html.
- For information on rotavirus vaccination, visit www.cdc.gov/rotavirus/vaccination.html.