Childhood Diarrhea Deaths after Rotavirus Vaccination in Mexico

TO THE EDITOR: The World Health Organization (WHO) recommends the use of rotavirus vaccines for all children worldwide to control severe rotavirus disease, which causes 527,000 childhood deaths annually. After the phased national introduction of rotavirus vaccine in Mexico in 2006 and 2007, we showed a marked reduction in the rate of death from childhood diarrhea during the rotavirus season (December to May) of 2007–2008 and 2008–2009 (Jan. 28, 2010, issue). However, because of year-to-year variations in diarrhea rates, cautious interpretation was warranted with regard to whether rotavirus vaccination had a causal role in this reduction. In addition, emerging evidence from Africa, Asia, and poor settings of Latin America suggests the possibility of waning vaccine efficacy after the first year of life.

To address these concerns, we continued to monitor diarrhea-related deaths in Mexican children and compared diarrhea-related mortality during a 3-year period after the introduction of the vaccine (2008–2010) with mortality during rotavirus seasons in baseline years (2003–2006), excluding the transition year (2007).

We found a sustained reduction in diarrhea-related mortality for children under the age of 5 years for 3 full years (Fig. 1). As compared with baseline, diarrhea mortality fell by 56% (95% confidence interval [CI], 49 to 63) during rotavirus seasons after vaccination. Reductions were primarily among children under 1 year of age in the 2007–2008 season and extended to older ages in subsequent seasons. Annual diarrhea-related mortality among children under the age of 5 years dropped by 46% (95% CI, 42 to 50) from an average of 18 deaths per 100,000 in 2003–2006 to 9 deaths per 100,000 in 2008–2010 (P<0.001). These findings translate to an annual reduction of approximately 880 deaths related to childhood diarrhea. Overall, most of the reduction was among children under 2 years of age, who accounted for approximately 90% of the diarrhea-related mortality among children under the age of 5 years.

Before 2010, approximately half of children under 5 years of age and 78 to 89% of those under 2 years of age had received at least one dose of rotavirus vaccine. On the basis of the sustained 46% reduction in diarrhea-related mortality and the approximate 90% coverage for the rotavirus vaccine among children under 2 years of age, we estimate that some 50% of the deaths related to childhood diarrhea in Mexico were...
attributable to rotavirus infection that occurred before vaccination.

The sustained reduction in the rate of death from diarrhea for three seasons after the introduction of the rotavirus vaccine, with reductions progressively extending to other age groups as they become age-eligible for vaccination, provides evidence that some mortality reduction is likely attributable to vaccination. The cumulative reduction of some 2640 childhood deaths since the vaccination program was initiated in Mexico highlights the lifesaving promise of rotavirus vaccines and supports the WHO recommendation for immunization of all children worldwide against rotavirus.

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.


CORRECTIONS

MYO1E, Focal Segmental Glomerulosclerosis, and the Cytoskeleton (July 28, 2011;365:368-9). In the third paragraph (page 368), in the sentence that begins, “Mutations in APOL1,” the term “apolipoprotein A1” should have been “apolipoprotein L1.” The article is correct at NEJM.org.

Effect of Nesiritide in Patients with Acute Decompensated Heart Failure (July 7, 2011;365:32-43). The author listed as “W.H. Wilson” (page 32), should have been listed as “W.H.W. Tang.” The article is correct at NEJM.org.

In the August 4, 2011, issue, the photograph on page 453 should have been attributed to Merlin Larson, M.D., rather than Merlin Lawton, M.D. We regret the error.

NOTICES

Letters submitted for publication should contain a mailing address and telephone number of a contact person or department. We regret that we are unable to publish all notices received. Notices also appear on The Journal’s Web site (NEJM.org/medical-conference). The listings can be viewed in their entirety or filtered by specialty, location, or month.

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