Addition of Severe Combined Immunodeficiency as a Contraindication for Administration of Rotavirus Vaccine

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In response to reported cases of vaccine-acquired rotavirus infection in infants with severe combined immunodeficiency (SCID) following rotavirus vaccine administration, both Merck & Co. and GlaxoSmithKline Biologicals have revised the prescribing information and patient labeling for their respective rotavirus vaccine products, pentavalent rotavirus vaccine (RV5) and monovalent rotavirus vaccine (RV1), with approval from the Food and Drug Administration (*1,2*). Merck revised the prescribing information and patient labeling for RV5 in December 2009, and GlaxoSmithKline Biologicals did so for RV1 in February 2010. After the revision to the RV5 prescribing information, CDC sought consultation from members of the former Rotavirus Vaccine Work Group of the Advisory Committee on Immunization Practices (ACIP). On the basis of that consultation and available data, CDC is updating the list of contraindications for rotavirus vaccine. Rotavirus vaccine (both RV5 and RV1) is contraindicated in infants diagnosed with SCID.

SCID includes a group of rare, life-threatening disorders caused by at least 15 different single gene defects that result in profound deficiencies in T- and B- lymphocyte function (*3*). The estimated annual incidence of SCID is one case per 40,000--100,000 live births, or a total of approximately 40--100 new cases among infants in the United States each year (*3*). SCID usually is diagnosed after an infant has acquired a severe, potentially life-threatening infection caused by one or more pathogens. Infants with SCID commonly experience chronic diarrhea, failure to thrive, and early onset of infections. Chronic, wild-type rotavirus infection has been reported in infants with SCID, with resulting prolonged diarrhea or shedding of rotavirus (*4*). Diagnosis and hematopoietic stem cell transplantation before onset of severe infections offer the best chance for long-term survival of SCID patients (*3,5*).

The median age at diagnosis of SCID is 4--7 months, which overlaps with the ages for rotavirus vaccination recommended by ACIP (ages 2, 4, and 6 months for RV5; ages 2 and 4 months for RV1). Prenatal diagnosis is possible for the minority of infants with a known family history of SCID. Newborn screening for SCID through evaluation of dried blood spots is available in two states, Massachusetts and Wisconsin. On January 21, 2010, the Federal Advisory Committee on Heritable Disorders in Newborns and Children recommended that a screening test for SCID be included in the core panel of the recommended uniform screening panel for all newborn infants. On May 21, the U.S. Department of Health and Human Services approved the addition of SCID to the uniform screening panel.

Since introduction of rotavirus vaccine in the United States in 2006, five cases (four in the United States and one in Australia) of vaccine-acquired rotavirus infection in RV5-vaccinated infants with SCID have been reported in the literature (*6--8*). Two additional U.S. cases of vaccine-acquired infection in RV5-vaccinated infants with SCID and one case of vaccine-acquired infection in an RV1-vaccinated infant with SCID from outside the United States have been reported to the Vaccine Adverse Event Reporting System (VAERS). The eight infants (four males and four females) were diagnosed with SCID between ages 3 months and 9 months and had received 1--3 doses of rotavirus vaccine before the diagnosis. All the infants had diarrhea, and most had additional infections (e.g., *Pneumocystis jirovecii,* rhinovirus, adenovirus*, Salmonella, Escherichia coli*, and *Giardia*) at the time of SCID diagnosis. Rotavirus infection was diagnosed by enzyme immunoassay in seven of the eight patients for whom this information was available. In all eight cases, vaccine-acquired rotavirus infection was confirmed by reverse transcription--polymerase chain reaction (RT-PCR) and nucleotide sequencing. Prolonged shedding of vaccine virus was documented in at least six of these cases, with duration of up to 11 months.

Rotavirus vaccine (both RV5 and RV1) is contraindicated in infants diagnosed with SCID. Consultation with an

immunologist or infectious disease specialist is advised for infants with known or suspected altered immunocompetence before rotavirus vaccine is administered (*9*). General guidelines on immunodeficiency and use of live virus vaccines are available in the *2009 Red Book*, Table 1.14 (*10*).

References

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