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Influenza Vaccines

Revised: March 16, 2020.

Drug Levels and Effects

Summary of Use during Lactation

The Centers for Disease Control and Prevention and several health professional organizations state that vaccines given to a nursing mother do not affect the safety of breastfeeding for mothers or infants and that breastfeeding is not a contraindication to either the live, attenuated (i.e., inhaled) or inactivated (i.e., injected) influenza vaccine, including H1N1 (swine) influenza vaccine. Immunization of the mother during pregnancy increases the amount of influenza antibodies in breastmilk and may offer added protection of their breastfed infants against influenza.[1,2] Breastmilk antibody responses are higher with the inactivated influenza vaccine than with the live oral vaccine.[3] Breastfed infants should be vaccinated according to the routine recommended schedules.[4-7]

Pasteurization decreases some of the anti-influenza antibody concentrations in milk. In one study, Holder pasteurization of donor breastmilk decreased IgM antibody concentration against H1N1 hemagglutinin and H3N2 neuraminidase by 2.5-fold and 23-fold, respectively. IgG antibodies against H3N2 hemagglutinin were decreased by half by pasteurization of skimmed milk. Pasteurization of whole milk decreased anti-H3N2 neuraminidase IgM by two-thirds. The relative abundance of anti-H1N1 hemagglutinin IgA, anti-H3N2 neuraminidase IgA, and anti-H1N1 hemagglutinin IgG did not differ between raw milk and pasteurized whole or skimmed milk. Anti-H1N1 hemagglutinin IgM, anti-H3N2 neuraminidase IgM, and anti-H3N2 neuraminidase IgG in pasteurized whole milk were 2.5-, 7.3-, and 1.5-fold higher than than in pasteurized skimmed milk but did not differ for other antibodies.[8]

Drug Levels

Maternal Levels. A study compared the effects of inactivated influenza vaccine (Fluzone, 2011-2012 strains) and live attenuated influenza vaccine (FluMist, 2012-2013 strains) in nursing mothers who were 28 to 120 days postpartum. Breastmilk IgG and IgA (H1N1 strain only), serum hemagglutination inhibition (HAI), and serum IgG responses were higher after the inactivated vaccine than after the live oral vaccine.[3]

Maternal milk and infant gastric and stool samples were collected from 20 premature-delivering mother-infant pairs ranging in gestational age at birth from 26 to 36 weeks in the neonatal intensive care unit. Samples were collected at 8 to 9 days and 21 to 22 days postpartum. Results were compared to the same infant samples when the infants were given donor milk. Gastric samples were collected 30 minutes after the end of the feeding. IgA

antibodies to H1N1 hemagglutinin and H3N2 neuraminidase were 3.6- and 2-fold higher, respectively, in maternal milk than donor milk feeds given at 8–9 days of postnatal age but did not differ at 21–22 days. IbM antibodies to H1N1 hemagglutinin (10- and 3-fold) and H3N2 neuraminidase-specific IgM (13- and 8-fold) were higher in maternal milk than in donor milk feeds given at 8–9 days and 21–22 days of postnatal age, respectively. H1N1 hemagglutinin-specific IgG was 2-fold higher in maternal than donor milk feeds given at 8–9 days and 21–22 days of postnatal age. H3N2 neuraminidase-specific IgG was 30% higher in maternal milk than donor milk feeds given at 8–9 days but did not differ at 21–22 days. In gastric contents, H1N1 hemagglutinin-specific IgG was 2-fold higher in maternal milk than donor feeds given at 8–9 days and 21–22 days of postnatal age. H3N2 neuraminidase-specific IgG was 30% higher in maternal milk than donor milk feeds given at 8–9 days but did not differ at 21–22 days.[8]

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Limited data indicate that breastfeeding can enhance the response of the infant to certain vaccine antigens.[4,7,9]

In a study of pregnant women who were immunized during the third trimester and breastfed their infants for an average of 14 weeks, their infants had a 36% reduction in respiratory illness with fever, and a 63% reduction in laboratory-confirmed influenza during the first 6 months of life. However, the contribution of breastfeeding compared with passive transfer of maternal antibodies during pregnancy was not determined.[10]

A prospective, blinded trial in Bangladesh compared outcomes of mothers randomly assigned to receive either trivalent influenza vaccine or pneumococcal polysaccharide vaccine in the third trimester of pregnancy and their infants. Influenza-specific IgA levels were higher in the breastmilk of those immunized against influenza than pneumococcus until at least 6 months postpartum. The breastfed infants of influenza-vaccinated mothers had fewer episodes of respiratory illness with fever in the first 6 months postpartum, which was positively correlated with the extent of exclusive breastfeeding.[2]

A study compared the effects of inactivated influenza vaccine (Fluzone, 2011-2012 strains) and live attenuated influenza vaccine (FluMist, 2012-2013 strains) in nursing mothers who were 28 to 120 days postpartum. The breastfed infants whose mothers received the live attenuated strain had more fussiness (60%) than those whose mothers received the inactivated vaccine (45%).[3]

Effects on Lactation and Breastmilk

Relevant published information was not found as of the revision date.

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Substance Identification

Substance Name

Influenza Vaccines

Drug Class

Breast Feeding

Lactation

Vaccines