



Poliovirus Vaccines

Revised: June 15, 2020.

Drug Levels and Effects

Summary of Use during Lactation

The Centers for Disease Control and Prevention and American Academy of Pediatrics 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 poliovirus vaccine. The injectable polio vaccine now recommended in the United States is inactivated and poses no risk when given to mothers who are breastfeeding.[1,2] Breastfeeding also appears to reduce infant side effects associated with routine childhood immunization and can reduce the efficacy of oral polio vaccines.[3] However, some studies indicate that breastfeeding might improve infant response to oral polio vaccine.[4,5] Breastfed infants should be vaccinated according to the routine recommended schedules. Exclusive breastfeeding improves the response to oral polio vaccine in countries with poor infant nutrition and high rates of infant diarrhea.

Drug Levels

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

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

Effects in Breastfed Infants

Breastfed infants are less likely to have fever and may be less likely to experience anorexia and reduced energy intake after routine childhood immunization than those who are not breastfed.[6,7]

Administration of oral poliovirus vaccine to nursing infants is less effective if it is given the neonatal period, due to maternal antibodies in colostrum and breastmilk.[8-10] However, when given according to accepted vaccination schedules, breastfeeding does not interfere with the infant's response to oral polio vaccine.[11-13]

One study found that in previously vaccinated infants at 21 to 40 months of age breastfed infants had higher neutralizing antibody titers, higher secretory IgA levels in saliva and higher fecal IgM against polio than formula-fed infants.[14]

Disclaimer: Information presented in this database is not meant as a substitute for professional judgment. You should consult your healthcare provider for breastfeeding advice related to your particular situation. The U.S. government does not warrant or assume any liability or responsibility for the accuracy or completeness of the information on this Site.

Attribution Statement: LactMed is a registered trademark of the U.S. Department of Health and Human Services.

A study in Zambia found that infants whose mothers were infected with HIV had reduced antibody responses to oral polio vaccination than infants whose mothers were HIV negative. However, when results were corrected for duration of breastfeeding, difference was small. The authors concluded that HIV-positive mothers breastfed for shorter durations (mean 6 months) than HIV-negative mothers (mean 15 months), resulting in a lowered immune response to oral polio vaccine.[15]

A study in Bangladesh found that antibody titers for oral poliovirus vaccine (OPV) type 3 were inadequate in 13.6% of infants who received OPV at 6 months and 7.3% of infants who received OPV at 12 months. Failure rates for types 1 and 2 were lower, as was the failure rate for intramuscular polio vaccine. Malnutrition and more than 2 diarrheal episodes appeared to be the causative factors for the poor response. Exclusive breastfeeding was associated with a better response to OPV 3.[4]

A subsidiary analysis of a study in Chilean infants that compared trivalent inactivated polio vaccine plus bivalent oral polio vaccine to trivalent inactivated polio vaccine alone found that breastfed infants might have a better mucosal response against type 2 poliovirus.[5]

A study in Zimbabwe found that supplementing infants who received oral polio vaccine and their mothers with a single large dose of vitamin A did not improve their antibody response to the vaccine.[16]

Effects on Lactation and Breastmilk

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

References

1. Ezeanolue E, Harriman K, Hunter P, et al. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP). Available at: <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html> Accessed June 5, 2020
2. Kimberlin DW, Brady MT, Jackson MA, et al. Red Book: 2018 Report of the Committee on Infectious Diseases. 31st ed. Elk Grove Village, IL: American Academy of Pediatrics. 2018.
3. Parker EP, Ramani S, Lopman BA, et al. Causes of impaired oral vaccine efficacy in developing countries. *Future Microbiol.* 2018;13:97–118. PubMed PMID: 29218997.
4. Haque R, Snider C, Liu Y, et al. Oral polio vaccine response in breast fed infants with malnutrition and diarrhea. *Vaccine.* 2014;32:478–82. PubMed PMID: 24300591.
5. Brickley EB, Wieland-Alter W, Connor RI, et al. Intestinal immunity to poliovirus following sequential trivalent inactivated polio vaccine/bivalent oral polio vaccine and trivalent inactivated polio vaccine-only immunization schedules: Analysis of an open-label, randomized, controlled trial in Chilean infants. *Clin Infect Dis.* 2018;67 Suppl 1:S42–S50. PubMed PMID: 30376086.
6. Pisacane A, Continisio P, Palma O, et al. Breastfeeding and risk for fever after immunization. *Pediatrics.* 2010;125:e1448–52. PubMed PMID: 20478932.
7. López-Alarcón M, Garza C, Habicht JP, et al. Breastfeeding attenuates reductions in energy intake induced by a mild immunologic stimulus represented by DPTH immunization: possible roles of interleukin-1beta, tumor necrosis factor-alpha and leptin. *J Nutr.* 2002;132:1293–8. PubMed PMID: 12042449.
8. Vaccine World Health Organization Collaborative Study Group on Oral Poliovirus. Factors affecting the immunogenicity of oral poliovirus vaccine: a prospective evaluation in Brazil and the Gambia. *J Infect Dis.* 1995;171:1097–106. PubMed PMID: 7751683.
9. Plotkin SA, Katz M, Brown RE, et al. Oral poliovirus vaccination in newborn African infants. *Am J Dis Child.* 1966;111:27–30. PubMed PMID: 5900282.
10. Zaman S, Carlsson B, Jalil F, et al. Specific antibodies to poliovirus type I in breastmilk of unvaccinated mothers before and seven years after start of community-wide vaccination of their infants with live, oral poliovirus vaccine. *Acta Paediatr Scand.* 1991;80:1174–82. PubMed PMID: 1785290.

11. Triki H, Abdallah MV, Ben Aissa R, et al. Influence of host related factors on the antibody response to trivalent oral polio vaccine in Tunisian infants. *Vaccine*. 1997;15:1123–9. PubMed PMID: 9269056.
12. Kim-Farley R, Brink E, Orenstein W, et al. Vaccination and breast-feeding. *JAMA* 1982;248:2451-2. Letter. PMID: 7131700
13. John TJ, Devarajan LV, Luther L, et al. Effect of breast-feeding on seroresponse of infants to oral poliovirus vaccination. *Pediatrics*. 1976;57:47–53. PubMed PMID: 174056.
14. Hahn-Zoric M, Fulconis F, Minoli I, et al. Antibody responses to parenteral and oral vaccines are impaired by conventional and low protein formulas as compared to breast-feeding. *Acta Paediatr Scand*. 1990;79:1137–42. PubMed PMID: 2085099.
15. Sanz-Ramos M, Manno D, Kapambwe M, et al. Reduced poliovirus vaccine neutralising-antibody titres in infants with maternal HIV-exposure. *Vaccine*. 2013;31:2042–9. PubMed PMID: 23474309.
16. Church JA, Rukobo S, Govha M, et al. Neonatal vitamin A supplementation and immune responses to oral polio vaccine in Zimbabwean infants. *Trans R Soc Trop Med Hyg*. 2019;113:110–5. PubMed PMID: 30576507.

Substance Identification

Substance Name

Poliovirus Vaccines

Drug Class

Breast Feeding

Lactation

Vaccines