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Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

POLICY STATEMENT

Infant Feeding and Transmission of Human Immunodeficiency Virus in the United States

COMMITTEE ON PEDIATRIC AIDS

KEY WORDS
HIV, human milk, mother-to-child transmission

ABBREVIATIONS
AAP—American Academy of Pediatrics
CDC—Centers for Disease Control and Prevention
PEP—postexposure prophylaxis
WHO—World Health Organization

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abstract

FREE

Physicians caring for infants born to women infected with HIV are likely to be involved in providing guidance to HIV-infected mothers on appropriate infant feeding practices. It is critical that physicians are aware of the HIV transmission risk from human milk and the current recommendations for feeding HIV-exposed infants in the United States. Because the only intervention to completely prevent HIV transmission via human milk is not to breastfeed, in the United States, where clean water and affordable replacement feeding are available, the American Academy of Pediatrics recommends that HIV-infected mothers not breastfeed their infants, regardless of maternal viral load and antiretroviral therapy. *Pediatrics* 2013;131:391–396

BACKGROUND

Breastfeeding provides numerous health benefits to infants. In addition to providing optimal infant nutrition, human milk contains immune-modulating factors that protect against morbidity and mortality from infectious diseases, particularly those causing respiratory and gastrointestinal tract illnesses, which is especially important for infants living in resource-limited countries where infectious diseases are a major cause of infant mortality.[1] The American Academy of Pediatrics (AAP) strongly supports exclusive breastfeeding for approximately 6 months, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant.[2]

Given that each year, approximately 8700 HIV-infected women give birth in the United States,[3] it is critical that physicians are aware of the HIV transmission risk from human milk and the current recommendations for feeding HIV-exposed infants in the United States. HIV can be transmitted from mother to child through human milk, with ongoing risk of infection throughout the breastfeeding period.[4] In the absence of antiretroviral prophylaxis, postnatal infection risk appears to be highest in the first 4 to 6 weeks of life, ranging from 0.7% to 1% per week.[5–7] However, risk continues for the duration of breastfeeding; in 2 large studies, late postnatal transmission risk after 4 to 6 weeks of age was 8.9 infections per 100 child-years of breastfeeding (approximately 0.17%/week) and was constant throughout this period.[4,8] Transmission risk is higher for women who acquire HIV infection (acute HIV infection) during lactation than for women with

preexisting infection[9]; in 1 study, the cumulative risk of transmission of HIV via human milk was 14% from mothers with chronic HIV infection compared with 25% to 30% among mothers who acquired HIV during late pregnancy or lactation.[8] Other factors associated with increased risk of HIV transmission via human milk include high maternal plasma and human milk viral load, low maternal CD4+ cell count, longer breastfeeding duration, breast abnormalities (eg, mastitis, nipple abnormalities), oral lesions in the infant, mixed breastfeeding and formula feeding in the first few months of life (compared with exclusive breastfeeding), and abrupt weaning.[7]

Recent studies in Africa have revealed that 6 months of antiretroviral prophylaxis, either daily infant nevirapine or a triple-drug antiretroviral regimen administered to the mother, significantly reduced postnatal transmission risk to 1% to 5%.[10] On the basis of these data, the World Health Organization (WHO) published revised feeding guidelines for infants born to HIV-infected mothers living in resource-limited settings where infectious disease and malnutrition are major causes of infant mortality and replacement feeding is not feasible. In such settings, the WHO recommends exclusive breastfeeding for the first 6 months of life, followed by complementary foods and breastfeeding through 12 months of age, accompanied by postnatal infant or maternal antiretroviral prophylaxis to reduce HIV transmission during breastfeeding.[11,12]

However, neither infant nor maternal postpartum antiretroviral prophylaxis completely eliminates the risk of HIV transmission via human milk. In the United States, with current interventions, mother-to-child HIV transmission during pregnancy and labor is very low at under 1%.[13] Breastfeeding transmission rates with antiretroviral prophylaxis administered to either the infant or the mother, although low, are still 1% to 5%, and transmission can occur despite undetectable maternal plasma RNA concentrations.[14] Maternal prophylaxis with triple-drug regimens may be less effective if first started during the postpartum period or late in pregnancy, because it takes several weeks to months before full viral suppression in human milk is achieved.[15,16] Antiretroviral drugs taken by the mother have differential penetration into human milk, with some drugs achieving concentrations much higher or lower than maternal plasma concentrations.[10,17] Although clinical trials of maternal antiretroviral prophylaxis to prevent postnatal transmission in resource-limited countries have generally shown low infant toxicity, increased rates of severe infant anemia and development of multiclass antiretroviral drug resistance in infants infected despite prophylaxis have been reported.[18,19] Therefore, in the United States, where there is access to clean water and affordable replacement feeding, the AAP continues to recommend complete avoidance of breastfeeding as the best and safest infant feeding option for HIV-infected mothers, regardless of maternal viral load and antiretroviral therapy.

An HIV-infected woman receiving effective antiretroviral therapy with repeatedly undetectable HIV viral loads in rare circumstances may choose to breastfeed despite intensive counseling.[20] This rare circumstance (an HIV-infected mother on effective treatment and fully suppressed who chooses to breastfeed) generally does not constitute grounds for an automatic referral to Child Protective Services agencies. Although this approach is not recommended, a pediatric HIV expert should be consulted on how to minimize transmission risk, including exclusive breastfeeding. Communication with the mother's HIV specialist is important to ensure careful monitoring of maternal viral load, adherence to maternal therapy, and prompt administration of antimicrobial agents in instances of clinical mastitis. Infant HIV infection status should be monitored by nucleic acid (plasma HIV RNA or DNA) amplification testing throughout lactation and at 4 to 6 weeks and 3 and 6 months after weaning. Breastfeeding by an infected mother with detectable viral load or receiving no antiretroviral therapy despite intensive counseling represents a difficult ethical problem that requires consultation with a team of experts to engage the mother in a culturally effective manner that seeks to address both her health as well as her child's.

The optimal strategy for management of breastfeeding women with suspected acute HIV infection is unknown. In such circumstances, the mother should undergo appropriate evaluation (ie, plasma HIV RNA test as well as an HIV antibody test, because the antibody test result may be negative in acute infection), and breastfeeding should be stopped until HIV infection is confirmed or ruled out. Mothers should be assisted to pump and store expressed milk until a confirmatory test result is available and supported with skin-to-skin care to maintain milk supply; if HIV infection is ruled out, breastfeeding can resume. If the mother is found to be HIV infected, the infant should undergo age-appropriate HIV diagnostic testing evaluation, with follow-up testing at 4 to 6 weeks and 3 and 6 months after breastfeeding cessation if the initial test result is negative.[13]

The use of antiretroviral postexposure prophylaxis (PEP) has not been studied in infants born to mothers with acute HIV infection. Infant PEP may be less effective in this circumstance compared with other nonoccupational exposures, because human milk exposure is likely

to have occurred over a prolonged period rather than from a single exposure. A regimen of daily nevirapine given to breastfeeding infants born to women with chronic HIV infection significantly reduces postnatal infection.[10] Whether a combination infant regimen would be more effective is unknown. In a study of infant prophylaxis in Malawi, the combination of daily nevirapine and zidovudine was not more effective in reducing transmission and was associated with more hematologic toxicity.[21] Some experts recommend providing a combination 3-drug regimen to exposed infants that is effective for treatment in HIV-infected infants. The appropriate prophylaxis duration is unknown; 4 weeks is used for nonoccupational exposure PEP. Consultation with a pediatric HIV expert is recommended with regard to decisions about the use of PEP for infants of breastfeeding women diagnosed with acute HIV infection; the National Perinatal HIV Hotline (1-888-448-8765) is a federally funded service providing referrals and free clinical consultation to physicians providing care for HIV-infected women and their infants.

The use of expressed human milk for the nutrition of sick, preterm, and recuperating neonates in ICUs is common practice, and some mothers express milk for feeding their infants in child care settings. The potential for transmission of infectious agents, such as HIV, through donor milk requires appropriate selection and screening of donors and careful collection, processing, and storage of milk. Donor human milk banks that belong to the Human Milk Banking Association of North America (http://www.hmbana.org/) voluntarily follow guidelines of the Centers for Disease Control and Prevention (CDC), which include screening of donors for infectious transmissible agents as well as heat treatment of the milk. Holder pasteurization (ie, heating at 62.5°C for >30 minutes) is the only method that completely eradicates HIV in all human milk components and is the current standard in human donor milk banks in the United States. Flash-heat pasteurization (heating milk in a water bath to 100°C and removing it when water reaches a rolling boil, then allowing it to cool) has been recommended as a potential method for pasteurizing human milk in developing countries, because it is more feasible for caregivers and preserves more nutritive elements. However, although flash-heat pasteurization destroys cell-free HIV, it does not destroy cell-associated HIV in human milk[22]; therefore, in the United States, where there is access to clean water and affordable replacement feeding, infant feeding of expressed flash-heat–treated human milk from HIV-infected women is not recommended. Informal milk-sharing practices (ie, person-to-person or Internet sharing) are discouraged, because formal procedures for donor laboratory screening and pasteurization of milk cannot be guaranteed through such venues (http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/PediatricAdvisoryCommittee/UCM238627.pdf).[23] Gloves are not recommended for the routine handling of expressed human milk but should be worn by health care workers in situations in which exposures to human milk might be frequent or prolonged, such as in human milk banking.

Recommendations for management of accidental exposure of an infant to human milk not obtained from his or her mother are available from the CDC (http://www.cdc.gov/breastfeeding).

Risk of HIV transmission in the case of an infant consuming human milk from a woman other than the mother in the United States is low, because women with known HIV infection are advised not to breastfeed their infants, HIV screening of milk donors and heat treatment of human milk is performed by milk banks, and HIV transmission from a single human milk exposure has not been documented.

In 2009, the CDC reported late HIV transmission events in infancy among 3 HIV-infected children suspected to have acquired HIV infection as a result of consuming premasticated (prechewed) food given to them by their HIV-infected caregivers.[24] Phylogenetic comparisons of virus from cases and suspected sources and supporting clinical history and investigations suggest that the feeding of premasticated foods to the infants was the route of transmission. Subsequent investigation has identified additional children with potential HIV acquisition through premastication.[25] In a cross-sectional survey of primary caregivers of HIV-exposed infants 6 months of age or older from 9 pediatric clinics in the United States, 31% reported that the child had received premasticated food from either themselves, someone else, or both. Most primary caregivers were biological mothers and were HIV infected. Physicians should routinely inquire about this feeding practice and should instruct HIV-infected caregivers on potential risks, including premastication, as well as safer feeding options.

CONCLUSIONS

When making infant feeding recommendations, physicians should be aware of the potential for HIV transmission through human milk; knowledge of maternal HIV serostatus is essential to determine whether breastfeeding is appropriate. The WHO has developed recommendations for breastfeeding in resource-limited countries.[11,12] The following recommendations are made by the AAP for the United States, where the risks of infectious diseases and malnutrition for infants who are not breastfed are outweighed by the risks

of HIV transmission through human milk and where alternatives to breastfeeding are available. The CDC and the AAP recommend universal opt-out HIV screening of all pregnant women in the United States.[26,27] Because the only intervention to completely prevent HIV transmission via human milk is not to breastfeed, in the United States, where clean water and affordable replacement feeding are available, the AAP recommends that HIV-infected mothers not breastfeed their infants, regardless of maternal viral load and antiretroviral therapy.

RECOMMENDATIONS

1. Women and their physicians need to be aware of the potential risk of HIV transmission to infants during pregnancy, during labor and delivery, and from breastfeeding.
2. Documented routine, opt-out HIV antibody testing should be performed for all women seeking prenatal care in the United States. Knowledge of HIV infection status will facilitate implementation of measures to prevent the acquisition and transmission of HIV and can help to determine whether it is appropriate to breastfeed. Repeat testing may be considered for all HIV-seronegative women in the third trimester and is recommended for women receiving care in jurisdictions with high HIV prevalence (see http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm), for women delivering in health care facilities with an HIV infection prevalence of ≥1 per 1000 pregnant women, for women at increased risk of HIV acquisition, and for women with signs or symptoms of acute HIV infection.
3. For women in labor with undocumented HIV status during the current pregnancy, maternal HIV antibody testing with opt-out consent by using a rapid HIV test is recommended. Rapid antibody testing of the mother, by using either blood or saliva, is preferred over rapid testing of the infant; saliva HIV antibody testing should not be used for infant testing. A positive rapid test result should be confirmed by a standard HIV antibody test. Women with a positive HIV rapid antibody test result should promptly begin receiving antiretroviral prophylaxis to prevent intrapartum transmission (and their infants should receive prophylaxis), without waiting for results of the confirmatory test, and should be advised not to breastfeed. Mothers with a positive HIV rapid test result should be assisted to pump and store expressed human milk until a confirmatory test result is available and supported with skin-to-skin care to maintain milk supply; if HIV infection is ruled out, antiretroviral prophylaxis should be stopped and breastfeeding should be initiated. Women with a negative HIV rapid test result can initiate breastfeeding.
4. In the rare situation in which rapid HIV testing during labor is not immediately available, women with unknown HIV status should be counseled, with documentation in the medical record, regarding the potential high risk of HIV transmission through human milk should she be infected, and that an HIV test would be advised before initiation of breastfeeding.
5. In the United States, HIV-infected women should be counseled not to breastfeed or to provide their milk for the nutrition of their own or other infants, regardless of antiretroviral drug use or viral load; the discussion should be documented in the medical record. If financial resources are identified as a barrier to avoiding breastfeeding, physicians should assist in identifying appropriate financial support to access infant formula (eg, application to the Special Supplemental Nutrition Program for Women, Infants, and Children; http://www.fns.usda.gov/wic).
6. Women who are HIV seronegative should be strongly encouraged to exclusively breastfeed their infants.
7. Women who are HIV seronegative but who are at particularly high risk of seroconversion (eg, injection drug users or sexual partners of known HIV-infected persons or active drug users) should have repeat HIV testing and be provided education about HIV and the risk of transmission through human milk and should be provided an individualized recommendation concerning the appropriateness of breastfeeding.
8. In postpartum lactating women with suspected acute HIV infection, breastfeeding should be stopped until HIV infection is confirmed or ruled out. Pumping and temporarily discarding human milk can be recommended, and if HIV infection is ruled out, breastfeeding can resume. If maternal HIV infection is confirmed, the infant should undergo HIV testing. Consultation with a pediatric HIV expert is recommended regarding decisions about postexposure antiretroviral prophylaxis for the infant.
9. NICUs should develop polices for use of expressed milk for nutrition of neonates. Current standards of the Occupational Safety and Health Administration do not require gloves for routine handling of expressed human milk. However, gloves should be worn by health care workers in situations in which exposure to human

milk might be frequent or prolonged (eg, human milk banking).

10. Human milk banks should follow guidelines developed by the US Public Health Service, which include donor screening for HIV infection and assessing risk factors that predispose to infection, as well as pasteurization of all human milk specimens.
11. Physicians should routinely inquire about premastication and prewarming feeding practices and instruct HIV-infected caregivers on safer feeding options.

LEAD AUTHOR

Lynne M. Mofenson, MD

COMMITTEE ON PEDIATRIC AIDS, 2011–2012

Patricia M. Flynn, MD, Chairperson
Grace M. Aldrovandi, MD
Ellen Gould Chadwick, MD
Rana Chakraborty, MD
Ellen Rae Cooper, MD
Heidi Schwarzwald, MD
Jaime Martinez, MD
Russell B. Van Dyke, MD

LIAISONS

Kenneth L. Dominguez, MD, MPH – *Centers for Disease Control and Prevention*
Lynne M. Mofenson, MD – *National Institute of Child Health and Human Development*

CONSULTANT

Gordon E. Schutze, MD

STAFF

Anjie Emanuel, MPH

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