HIV transmission through breastfeeding

A REVIEW OF AVAILABLE EVIDENCE

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Glossary of terms

AZT (azidothymidine, also known as zidovudine [ZDV]): an antiretroviral drug that inhibits HIV replication. It was the first drug licensed to treat HIV infection. Today, it is commonly used in combination with other antiretroviral drugs to treat HIV infection, and, alone or in combination, in the prevention of mother-to-child transmission of HIV infection.

Breast-milk substitute: any food being marketed or otherwise represented as a partial or total replacement for breast milk, whether or not suitable for that purpose.

CD4+ cells (also known as "T4" or "helper T cells"): CD4+ lymphocytes (a type of white blood cell) are key to both humoral and cell-mediated immune responses. They are the main target cells for the HIV. Their number decreases with progression of HIV infection, and their level is used as a marker of severity of the infection.

CD8+ cells are also a subtype of T lymphocytes, which have an important function in fighting infection. Their number may increase with progression of HIV infection.

Cell-associated virus: HIV which lives inside the cell, measured as HIV-DNA.

Cell-free virus: parts of the virus (virions) not associated with a cell, measured as HIV-RNA.

Cessation of breastfeeding: completely stopping breastfeeding, including suckling.

Colostrum: the thick, yellow milk secreted by the breasts during the first few days after delivery. It gradually changes into mature milk at 3–14 days postpartum; it contains more antibodies and white blood cells than mature breast milk.

Commercial infant formula: a breast-milk substitute formulated industrially in accordance with applicable Codex Alimentarius standards to satisfy the nutritional requirements of infants during the first months of life up to the introduction of complementary foods.

Complementary food: any food, whether manufactured or locally prepared, used as a complement to breast milk or to a breast-milk substitute.

DNA: deoxyribonucleic acid, the carrier of genetic information, found in cell nuclei.

Enterocytes: the cells that form the lining of the intestinal wall.

Exclusive breastfeeding: an infant receives only breast milk, and no other liquids or solids, not even water, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

HAART: Highly Active AntiRetroviral Therapy, a combination of three or more antiretroviral drugs used in the treatment of HIV-infected people to reduce viral load.

Human immunodeficiency virus (HIV): the virus that causes AIDS. In this document, the term HIV means HIV-1. Mother-to-child transmission of HIV-2 is rare.

Immunoglobulins: the five distinct antibodies present in the serum and external secretions off the body (IgA, IgD, IgE, IgG and IgM).

Infant: a person from birth to 12 months of age.

Intrapartum: the period during labour and delivery.

Lamivudine, or 3TC: an antiretroviral drug often used in combination with zidovudine (AZT)

Lipid: any one of a widely varied group of fats and fat-like organic substances.

Macrophage: a type of white blood cell that ingests foreign material. Macrophages help destroy bacteria, protozoa and tumour cells and stimulate other cells of the immune system.

Mature breast milk: milk produced from about 14 days postpartum.

Mixed feeding: feeding both breast milk and other foods or liquids.

Mother-to-child transmission: transmission of HIV to a child from an HIV-infected woman during pregnancy, delivery or breastfeeding. The term is used here because the immediate source of the child's HIV infection is the mother. Use of the term *mother-to-child transmission* implies no blame, whether or not a woman is aware of her own infection status. A woman can contract HIV from unprotected sex with an infected partner, from receiving contaminated blood, from non-sterile instruments (as in the case of injecting drug users), or from contaminated medical procedures.

Neonatal: denotes the period from birth through the first 28 days of life.

Nevirapine (NVP): an antiretroviral drug commonly used either to treat HIV infection or as prophylaxis, alone or in combination with other drugs, to prevent mother-to-child transmission.

PCR: polymerase chain reaction, a qualitative or quantitative laboratory method in which the genetic material (DNA or RNA) of the virus is detected and amplified.

Peripartum transmission: mother-to-child transmission of HIV occurring shortly before, during or immediately after delivery.

Postnatal transmission: mother-to-child transmission of HIV after delivery, through breastfeeding.

Replacement feeding: feeding infants who are receiving no breast milk with a diet that provides the nutrients the infants need until the age at which they can be fully fed on family foods. During the first six months of life, replacement feeding should be with a suitable breast-milk substitute. After six months the suitable breast-milk substitute should be complemented with other foods.

RNA: ribonucleic acid, a substance present in the nucleus of all living cells and in many viruses. It is an intermediate form of DNA. It is the medium by which genetic instructions from the nucleus are transmitted to the rest of the cell.

RNA viral load: the result of a laboratory method, expressed as copies of RNA per ml of plasma or other body fluid; it reflects the amount of actively replicating virus in the body. Temporary high levels of viral RNA occur immediately after contracting infection. Later, levels increase with progression of disease. High levels are associated with high rates of mother-to-child transmission.

Transcytosis: a process by which specific macromolecules, such as nutrients or antibodies, are absorbed via polarized epithelial cells, which transport the macromolecule into the cell, transfer it across the cell, and release it to the other side.

Wet-nursing: breastfeeding by a woman other than the infant's mother.

Executive summary

Exclusive breastfeeding – breastfeeding with no other food or drink, not even water – is the ideal mode of infant feeding for the first six months of life. For optimal growth, development and health, infants should be exclusively breastfed for their first six months, and should then receive nutritionally adequate and safe complementary foods, while breastfeeding continues up to 24 months or beyond. With the onset of the HIV/AIDS epidemic, however, and the recognition that HIV-infected mothers can transmit HIV to their infants through breastfeeding, specific recommendations apply to infants born to HIV-infected mothers. The overall aim of these recommendations is to achieve the ultimate goal of increasing child survival, while reducing HIV infection in infants and young children.

Mother-to-child transmission of HIV can occur during the second and third trimesters of pregnancy, during delivery, or at any point during breastfeeding. The risk through breastfeeding is cumulative; the longer the HIV-infected mother breastfeeds, the greater the additional risk of transmission through breastfeeding. Where breastfeeding is common and prolonged, transmission through breastfeeding may account for up to half of HIV infections in infants and young children. Available interventions can reduce substantially the risk of transmission during pregnancy, labour and delivery, but, so far, risk reduction during breastfeeding has been much less successful. Research into prevention of breastfeeding transmission can reduce the rate to about 15% at three months, and triple combination therapy to under 6% at six weeks. Subsequent infection through breastfeeding, however, can increase the overall rate at 18–24 months to over 20%. The overall risk of mother-to-child transmission of HIV is substantially increased by maternal factors – high HIV viral load in plasma, a low CD4+ cell count, and AIDS – and by vaginal delivery or prematurity. Maternal factors are also associated with increased risk of transmission during breastfeeding. Recent maternal infection with HIV may raise the risk of transmission through breastfeeding to twice that of a woman with earlier established infection, owing probably to high viral load associated with recent infection.

It is not clear whether, or to what extent, the protection that breastfeeding normally confers against common childhood infections applies to breastfeeding of HIV-infected infants by HIV-infected mothers. Recent research in sub-Saharan Africa indicates that mortality in the first 12–18 months is similar in HIV-infected breastfed and non-breastfed infants. Nor is it clear whether, or in what ways, overall morbidity or mortality up to two years of age is related to different infant feeding practices; more studies are needed to clarify this issue.

Prevention of mother-to-child transmission

HIV-infected pregnant women should consider their infant feeding options. They should seek to balance