

Risk for mother-to-child HIV-1 infection was increased by breast-feeding

Nduati R, John G, Mbori-Ngacha D, et al. Effect of breastfeeding and formula feeding on transmission of HIV-1. A randomized clinical trial. JAMA. 2000 Mar 1;283:1167-74.

QUESTION

In the infants of HIV-1-infected women, does formula feeding instead of breast-feeding reduce the rate of HIV-1 transmission and mortality?

DESIGN

Randomized (allocation concealed*), blinded (investigators to interim results),* controlled trial with 2-year follow-up.

SETTING

4 antenatal clinics in Nairobi.

PATIENTS

425 HIV-1-infected pregnant women (mean age 23 y) who resided in Nairobi and had access to municipally treated water. 401 mother-infant pairs (94%) were included in the analysis.

INTERVENTION

Women were allocated to breast-feed ($n = 212$) or formula-feed ($n = 213$) their infants. Women in the formula-feed group were told to feed their infant with a cup and

had to demonstrate proper formula preparation and cup feeding to a visiting nurse.

MAIN OUTCOME MEASURES

Infant HIV-1 infection and mortality within the first 2 years. Mortality rates were compared using Kaplan-Meier survival analysis.

MAIN RESULTS

Analysis was by intention to treat. At 24 months, the cumulative probability of HIV-1 infection was higher in breast-fed infants than in formula-fed infants ($P = 0.001$) (Table). A significant difference existed between breast-fed and formula-fed infants at all ages after birth, with a 10.2% cumulative difference occurring at 6 weeks (CI 3.1 to 17.3, $P = 0.005$). The groups did

not differ for mortality ($P = 0.30$) (Table), and no difference existed at any age after birth.

CONCLUSIONS

In HIV-1-infected women, breast-feeding was associated with a greater transmission rate of HIV-1 infection to infants than was formula feeding, with a 10% difference between groups occurring by 6 weeks of age. The method of feeding did not affect mortality rates at 2 years.

*See Glossary.

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Breast-feeding vs formula feeding for infants of HIV-1-infected mothers at 24 months†

Outcomes	Cumulative rates		ARI (95% CI)	NNH (CI)
	Breast-feeding	Formula feeding		
HIV-1 infection	37%	21%	16% (6.5 to 26)	7 (4 to 16)
Mortality	24%	20%	4% (-4 to 13)	Not significant

†Abbreviations defined in Glossary; NNH and CI calculated from data in article.

COMMENTARY

The study by Nduati and colleagues, done in a resource-poor setting where breast-feeding is the norm, confirmed that breast-fed infants are at increased risk for HIV-1 infection. Applying these results in practice, however, is not easy. A major issue, raised by the authors themselves, is the lack of acceptability of formula feeding. In the study, many women in the formula-feeding group admitted to breast-feeding. The stigma associated with not breast-feeding, the convenience of breast-feeding, the cost of formula, and the potential for increased early mortality in infants not breast-fed all add to the difficulties of implementing a change in feeding patterns in these settings. Perhaps we should instead be looking at strategies to reduce the risk for HIV-1 transmission despite breast-feeding (1).

One strategy might be to use antiretroviral agents postpartum to prevent mother-to-child transmission. In a Ugandan trial, nevirapine was given as a single dose intrapartum and to the infant at 2 to 3 days (2). Nearly all the infants were breast-fed, and the transmission rates at 2 and 4 months were 11.9% and 13.1%, respectively.

A second strategy might be to determine whether a period of breast-feeding exists that optimizes the benefits and minimizes the risk for transmission of HIV-1. Unfortunately, it appears that the early weeks of breast-feeding, which provide the greatest benefit, are also when the highest risk for transmission exists (3).

A third strategy might be to consider other factors that could affect transmission from breast milk. For example, in an observational study

of 549 infants in South Africa, the rates of HIV-1 transmission at 3 months in those who were either formula-fed, mixed-fed, or exclusively breast-fed were 18.8%, 24.1%, and 14.6%, respectively (4). The intriguing possibility that the exclusion of other food modifies HIV-1 transmission from breast milk needs further study.

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