Chapter 20

EXCLUSIVE BREAST-FEEDING AND HIV INFECTION

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1. MOTHER TO CHILD HIV TRANSMISSION

Women can transmit HIV to their infants prenatally, at delivery or postpartum through breast-feeding. Without any interventions, 30-45% of infants of HIV-infected mothers become infected themselves. In many African countries, antiretroviral drugs, usually nevirapine, are becoming increasingly available for mothers and infants at delivery. Although programmatic data on transmission rates in nevirapine-treated populations are only beginning to become available, it appears that transmission rates by 4-6 weeks postpartum are approximately halved and that total transmission after a variety of low cost interventions in several African trials was 24%. This means that the breast-feeding route of transmission to approximately 16% of infants is becoming the major route of mother-to-child transmission in Sub-Saharan Africa. Unfortunately, even in urban areas of low income countries with potential access to delivery antiretrovirals, replacement feeding is associated with high risk of infant morbidity and mortality from other infections. This dilemma has caused enormous amounts of discussion among researchers and international agency staff and enormous anxiety and stress among women and health care staff in low income countries.

Therefore, there was great relief and hope a few years ago when it was reported from South Africa that exclusive breast-feeding (EBF) appeared to protect infants from postnatal transmission compared with infants mixed-fed with breast-milk and other foods. Since then EBF has been promoted in many places for HIV-infected women who do not have access to safe and nutritionally complete replacement foods, even though the South African study was the only evidence. Recently, however, a larger study in Zimbabwe found very similar results. The hazard ratio for HIV transmission between the ages of 6 weeks and 18 months was, compared with EBF, 1.61 (0.72 – 3.64) for predominant breast-feeding (breast-milk plus non-milk liquids), and 2.60 (1.21 – 5.55) for mixed feeding (breast-milk and non-human milk or solids). The study also found that 68% of postnatal transmission occurred after 6 months, suggesting that EBF to 6 months followed by early cessation might be a strategy for reducing postnatal HIV transmission. Both the Zimbabwean and South African studies were designed as randomised controlled trials of vitamin A supplementation and women selected their own feeding mode. The limitations in interpreting the associations of EBF with decreased HIV transmission in such non-randomised studies are well recognised.

### 2.1 Possible mechanisms whereby EBF could protect against postnatal HIV transmission

Is the relationship between EBF and reduced HIV transmission causal, and, if so, what is the mechanism? Three main mechanisms have been postulated: 1) mixed feeding damages the intestinal barrier permitting breast-milk virus to cross into the infant’s circulation; 2) mixed feeding stimulates immune cells and stimulated immune cells are more susceptible to HIV than are resting cells; 3) mixed feeding induces subclinical mastitis in the woman’s breasts, resulting in increased viral load in the milk. All of these potential mechanisms were considered in the South African study.

#### 2.1.1 Gut permeability

Permeability of the small intestine can be measured fairly non-invasively by a dual sugar permeability test. The test was carried out in the South African infants at 1, 6, and 14 weeks of age using lactulose and mannitol as the test sugars. The test was sensitive enough to detect increased gut