

# The new WHO recommendations on HIV and infant feeding - care for the mother, and in resource-limited settings let breastmilk care for the baby

Until 2009 the role of breastmilk in feeding HIV-exposed infants was fraught with international and national controversy. The general benefits of breastmilk and breastfeeding were differentially weighted against the risk of HIV transmission through breastmilk, and this splintered HIV and child health policy makers, implementers and activists. Ramdhial and Coovadia summarise the seven Key Recommendations in Infant Feeding in the *new* World Health Organization guidelines and highlight the training implications of these guidelines.<sup>1</sup> This paper discusses recent research findings that led to the development of these new guidelines and the implications of the guidelines for HIV-positive mothers, their infants and the South African prevention of mother-to-child transmission (PMTCT) programme.

## Recent research findings

The new evidence around HIV and infant feeding shows that maternal highly active antiretroviral therapy (HAART) and/or infant prophylaxis reduce postnatal breastmilk HIV transmission.<sup>2-5</sup> Maternal postnatal regimens appear to be just as efficacious as infant postnatal regimens, although the BAN study suggests a trend favouring infant nevirapine over maternal regimens: the rate of mother-to-child transmission of HIV at 28 weeks in BAN (where all HIV-positive mothers received single-dose nevirapine and tail cover) was 1.8% in breastfeeding infants receiving daily nevirapine for 6

months versus 3% in infants covered by maternal HAART for 6 months ( $p=0.0698$ ).<sup>2</sup> The PEPI study showed that after adjusting for risk factors (maternal CD4 cell count, maternal presentation, sex of infant and infant birth weight), 9-month HIV-free survival was higher among infants who received 14 weeks' postnatal prophylaxis compared with control infants who only received 1 week of ARV cover.<sup>6</sup> Both PEPI and SWEN show that the protective effect of infant postnatal prophylactic ARV regimens on breastmilk HIV transmission stops once the regimens stop.<sup>6,8</sup>

The new evidence has been summarised in a previous paper,<sup>9</sup> and the need for 'SUPPORT' to improve infant outcomes and reduce postnatal transmission has been suggested (Table I), viz. Screen all women for HIV; Send a CD4 cell count on all HIV-positive women; Screen all HIV-positive women, for specific criteria (previously called AFASS) as recommended by, or adapted from, the World Health Organization (WHO) (Fig. 1) using a standardised tool; Understand the woman's personal and socio-cultural context; Promote exclusive or predominant breastfeeding and review which woman fall out of the breastfeeding group by meeting specific criteria; Promote exclusive formula feeding if specific criteria are met; Organise supplies of antiretroviral medication, including infant prophylaxis, co-trimoxazole and nutritional support for mothers or infants (preferably through the Protein Energy

**TABLE I. 'SUPPORT': KEY MESSAGES TO PROMOTE SAFE INFANT FEEDING AND IMPROVE HIV-FREE SURVIVAL**

Support	Action
<b>S</b>	Screen all women for HIV Send off CD4 cell counts on all HIV-positive women Screen all HIV-positive women for the six WHO criteria (or a country adaptation thereof) to identify those women who may be able to 'fall out' of the breastfeeding group
<b>U</b>	Understand the mother's personal and socio-cultural context
<b>P</b>	Promote exclusive or predominant breastfeeding if all the six criteria are not met Plus start postnatal prophylactic regimens to minimise postnatal HIV transmission
<b>P</b>	Promote exclusive formula feeding if all the six criteria are met
<b>O</b>	Organise supplies: • of prophylactic antiretrovirals • of co-trimoxazole for infants from 6 weeks • of formula milk if mothers meet the six criteria and choose to formula feed
<b>R</b>	Review mothers and infants in the first 3 days postnatally, in the first 2 weeks postnatally and monthly thereafter Review mother's and infant's health, and infant feeding practices/techniques, regardless of feeding choice Review adherence to ARV regimens
<b>T</b>	Treat all mothers and children with antiretroviral therapy according to updated recommendations

Adapted from Goga *et al.*<sup>9,23</sup> and Jackson *et al.*<sup>24</sup>

**Mothers known to be HIV-infected** should only give commercial infant formula milk as a replacement feed to their HIV uninfected infants or infants who are of un-known HIV status, when specific conditions are met (*referred to as AFASS - affordable, feasible, acceptable, sustainable and safe in the 2006 WHO recommendations on HIV and Infant Feeding*):

- a. Safe water and sanitation are assured at the household level and in the community.
- b. The mother or other caregiver can reliably provide sufficient infant formula milk to support normal growth and development of the infant.
- c. The mother or caregiver can prepare it cleanly and frequently enough so that it is safe and carries a low risk of diarrhoea and malnutrition.
- d. The mother or caregiver can, in the first six months, exclusively give infant formula milk.
- e. The family is supportive of this practice.
- f. the mother or caregiver can access health care that offers comprehensive child health services.

**Fig. 1. WHO rapid guidance on HIV and infant feeding, 2010: Recommendation 5.<sup>1</sup>**

Malnutrition Scheme); Review health and feeding practices of ALL mothers and infants in the first 3 days after delivery, first 2 weeks postnatally and monthly thereafter, regardless of feeding choice; and lastly Treat all HIV-positive women and infants with HAART if they meet national criteria for HAART initiation.

### The new WHO guidelines and implications thereof

The revised WHO HIV and infant feeding guidelines state that national and sub-national authorities should decide whether health services will principally counsel and support HIV-infected mothers to either breastfeed and receive ARV interventions or avoid all breastfeeding, based on the approach that maximises infant HIV-free survival.<sup>1</sup> This implies that settings should adopt one specific overall (principal) feeding recommendation. However, the reality is that population-level decisions may be inappropriate at the individual level. A woman's right to individualised counselling and choice that is most appropriate to her circumstances is therefore of paramount importance and, ethically, this decision needs to be in the best interests of her child.

### South African revisions and implications thereof

In 2010 the South African government updated the national prevention of mother-to-child transmission (PMTCT) guidelines.<sup>10</sup> The new guidelines provide HAART to all pregnant women with CD4 cell counts  $\leq 350$  cells/ $\mu$ l, dual prophylaxis from 14 weeks of pregnancy, nevirapine and tenofovir/emtricitabine as tail cover, and either 6 weeks' nevirapine prophylaxis to infants of mothers on HAART or to non-breastfeeding HIV-exposed infants or continued nevirapine prophylaxis for breastfeeding HIV-exposed infants until 1 week after breastfeeding stops.

Although there are no data on the effectiveness of such infant antiretroviral prophylaxis for more than 6 months of breastfeeding, we postulate that cumulative HIV transmission at 9 months among breastfed HIV-exposed infants could range between 1.8% and 5% if we extrapolate from the BAN and PEPI studies<sup>2,6</sup> and that the effectiveness of maternal HAART on vertical transmission at 18 months could range between 3% and 9%.<sup>2,4,5</sup>

These data are promising, as they show marked reductions in HIV transmission with maternal HAART or with infant prophylaxis during breastfeeding. In settings where much of infant and under-5 mortality and morbidity are attributed to common infectious diseases and where under-nutrition contributes to 35 - 50% of under-5 deaths, these findings bring new hope as HIV-exposed infants may continue to breastfeed and to reap the child survival benefits of breastmilk.<sup>11</sup>

The new South African guidelines (2010) also speak about infant feeding options and the provision of free commercial infant formula for at least 6 months, but provide no guidance on how this should be done, i.e. which HIV-positive women should breastfeed? Who should avoid breastfeeding?

### Data on mode of feeding and infant outcome

The WHO collaborative study showed that exclusive breastfeeding, predominant breastfeeding, and any breastfeeding have greater child survival benefits than not breastfeeding, notwithstanding HIV.<sup>12</sup> The Lancet Child Survival series showed that universal coverage with exclusive breastfeeding (EBF) for the first 6 months and continued breastfeeding until at least 11 months may prevent 13% of under-5 deaths globally.<sup>13</sup>

Recent research has now highlighted the child survival benefits of breastfeeding in the context of HIV. The MASHI study in Botswana,<sup>14</sup> a randomised, controlled trial that compared infant outcomes between infants who avoided all breastfeeding and received 1 month's infant zidovudine (ZDV), and infants who received exclusive breastfeeding plus 6 months' infant ZDV prophylaxis, found that 7-month cumulative HIV transmission rates were 5.6% in the group that avoided breastmilk and 9.0% in the breastfed plus ZDV group. However, the cumulative incidence of infant death by month 7 was significantly higher in the group that avoided breastfeeding (9.3% v. 4.9%;  $p=0.003$ ). This supports findings from Kenya of increased early mortality among formula-fed infants.<sup>15,16</sup> At 18 months, despite the differing interventions in the MASHI study, HIV infection and death were similar in the two groups (13.9% v. 15.1%;  $p=0.60$ ).

Furthermore, a study of an outbreak of diarrhoea in Botswana in November 2005 - February 2006 found that 'not breastfeeding' was the most significant risk factor for diarrhoea (adjusted odds ratio 50, 95% confidence interval (CI) 4.5 - 100).<sup>17</sup> Most deaths occurred among HIV-exposed infants whose mothers received formula milk through the PMTCT programme. Among hospitalised infants 51% had poor growth before the diarrhoea.

In the ZEBS study,<sup>18</sup> not breastfeeding was associated with 2 - 4-fold increases in uninfected child mortality at 0 - 3, 4 - 5, 6 - 11 and 12 - 18 months; uninfected HIV-exposed infants who had stopped breastfeeding did not have a better survival at 24 months than uninfected exposed infants who continued breastfeeding (83.9% and 80.7%, respectively;  $p=0.27$ ); HIV-infected children at age 4 months who stopped breastfeeding had a higher 24-month mortality than infected children who continued breastfeeding (73.6% v. 54.8%;  $p=0.007$ ).

In South Africa research in a predominantly rural district showed that cumulative 3-month mortality in exclusively breastfed infants was 6.13% (95% CI 4.74 - 7.92) versus 15.12% (7.63 - 28.73) in infants given replacement feeds (hazard ratio for formula feeding 2.06, 95% CI 1.00 - 4.27,  $p=0.051$ ),<sup>19</sup> despite the fact that the HIV-positive women opting to avoid breastfeeding were better off socio-economically. Furthermore,

a study in routine PMTCT sites found that formula feeding in an environment without piped water, fuel or HIV status disclosure carries a 3.63 (95% CI 1.48 - 8.89) greater hazard of HIV transmission or death than formula feeding when these conditions are met.<sup>20</sup>

### Implications of these findings for mothers, health care providers and the SA PMTCT programme

These findings have two major implications for South Africa. Firstly, given the burden of HIV (which accounts for 30 - 40% of childhood deaths), diarrhoea, pneumonia and septicaemia in South Africa,<sup>21</sup> the socio-economic disparities (Gini coefficient 0.666<sup>22</sup>), and the data on infant outcome according to feeding practice, the most prudent feeding option for HIV-positive women in many areas of South Africa will be breastfeeding with ARV prophylaxis. Secondly, each pregnant woman or mother-infant pair needs to be assessed according to the 'SUPPORT' acronym in Table I. Women meeting the six WHO criteria (Fig. 1) – or a country adaptation thereof – could be advised not to breastfeed if the assessment shows that avoiding breastfeeding is appropriate for them and best for their infants. Women not meeting the criteria should be counselled on exclusive breastfeeding for the first 6 months with continued breastfeeding thereafter and nevirapine prophylaxis during the breastfeeding period until 1 week after breastfeeding stops.

Both groups of women (breastfeeding with prophylaxis and non-breastfeeding) need to be supported so that individual concerns and feeding difficulties are raised during routine child health visits. Each mother and baby should be followed up within 3 days of delivery, and then at least monthly thereafter in accordance with the IMCI guidelines.<sup>10</sup>

### Summary and conclusions

Based on recent research, the revised WHO HIV and infant feeding guidelines suggest that national and sub-national authorities should decide whether health services will principally counsel and support HIV-infected mothers to either breastfeed and receive ARV interventions or avoid all breastfeeding. This implies that countries or regions should adopt one specific overall (principal) feeding recommendation. In 2010 South Africa updated the PMTCT guidelines, based on the WHO guideline, and opted to provide 6 weeks' nevirapine prophylaxis for all HIV-exposed infants with continued nevirapine prophylaxis to all breastfeeding HIV-exposed infants until 1 week after breastfeeding stops.

Population-level decisions may, however, be inappropriate at the individual level. An HIV-positive woman's right to individualised counselling and a choice that is most appropriate to her circumstances is therefore of paramount importance, and when working from an ethics paradigm this decision needs to be in the best interests of her child. In most parts of South Africa exclusive breastfeeding will optimise HIV-free child survival. The WHO suggests using specific criteria (Fig. 1) to identify HIV-positive women who are exceptions to an overall health service feeding recommendation of breastfeeding with ARV prophylaxis for HIV-positive women.

The most pragmatic approach at this time is to SUPPORT (Table I) and care for each HIV-positive pregnant woman (CD4 cell counts, antiretrovirals for the mother's own health or for preventive treatment), including assessing her situation so that if all the environmental conditions for safe formula feeding exist, she could be offered an alternative to breastfeeding.

In settings where child morbidity and mortality from common diseases are high or where the six conditions highlighted

by the WHO are not met (in general or on an individual level), breastfeeding with ARV prophylaxis (or maternal HAART if mother is eligible) would be the most appropriate recommendation. In this way in resource-limited settings, services will provide care for the HIV-positive mother and breastmilk (with prophylaxis) will protect the infant from common killer diseases (diarrhoea and pneumonia) and thus contribute towards caring for the HIV-exposed infant.

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