

HATiP

HIV & AIDS Treatment in Practice

Issue 75 | 21 September 2006



In this issue:

Safer infant feeding update, part 2; *page 2*

- Debates about weaning at the World AIDS Conference
- Counselling and support
- Lay-counsellors, mothers and peer-support groups
- Involving the male partner
- Improving feeding alternatives for HIV-positive mothers not breastfeeding their infants
- Flash heating expressed breast milk
- Conclusion
- Resources
- References

Safer infant feeding update, part 2

Debates about weaning at the World AIDS Conference

How to wean safely and whether abrupt weaning is feasible, proved to be one of the most hotly debated infant feeding topics at the World AIDS Conference.

There seemed to be a divergence of opinion on how traumatic abrupt weaning is for the mother. In one conference session on PMTCT, Laurette Cucuzza of Centre for Development of Population Activities (CEDPA) said "I am concerned about abrupt weaning and the psycho-social impacts on women..." She spoke from personal experience about the difficulties of weaning her own child gradually and wondered "whether anyone had done any research on the trauma that abrupt weaning can cause for women."

Dr Valérie Leroy, who presented the Ditrane Plus findings (which reported reassuringly low transmission rates associated with early weaning (see <http://www.aidsmap.com/en/news/4B3A0A9D-2500-48E2-8A5E-4C490E212AED.asp>)) noted that definitions of abrupt weaning varied.

In the case of Ditrane Plus, "we counselled them to stop breastfeeding the child over a two week period and the median duration of weaning was 15 days," she said. The investigators also closely monitored adverse events and found no greater tendency to adverse events in the women who weaned earlier versus those who weaned later. She also said that the mothers weaned quite rapidly by themselves without any great problems.

Meanwhile, in a Zimbabwean study on the feasibility of early breastfeeding cessation (at around month 6) presented by Dr Naume Tavengwa during a PATH satellite session on breastfeeding at the conference, 11/12 HIV-positive mothers stopped breastfeeding, after receiving their infant's HIV-negative test result at month 6. Most weaned very rapidly — six within two days and 5 within one week.

In contrast, according to Dr Nigel Rollins of the University of KwaZulu Natal, very different experiences were reported in a South African study, also presented as a poster at the meeting by Bland et al. The study enrolled 1,217 HIV-infected and 1,219 uninfected women who were counselled, antenatally, on infant feeding as per WHO recommendations.

"We interviewed women before, during and after cessation of breastfeeding about their experiences, and it was very humbling. It really is hanging out our dirty washing because even though we thought that we had a reasonable support network, the women find [abrupt weaning] uniformly awful, isolating and very, very stressful."

"There's obviously the nutritional needs that need to be met, but one of the main messages from our side was that crying was the major driver of mothers' responses and in a way, crying is the new risk factor for mother to child transmission. Because it is crying and the behaviour of the child that drives mixed feeding. The staff were very clear on the fact that exclusive breastfeeding was protective and that with the introduction of other feeds the risk increases, but it is the crying of the baby in public that really drives mothers' behaviours in many situations."

The likelihood of feeding the infant after partial weaning is high, several studies at the meeting suggested, because many mothers

who are weaning haven't formed a clear plan of how they will feed the infant once it is weaned (Paoli). As a result, the first couple days after weaning, "many mothers start a "quest for food" that ends with various feeding patterns," according to Alfieri et al, describing difficulties mother face when weaning in Burkina Faso.

And when no suitable alternative food can be found, it must be difficult to stick to weaning — especially when the baby is hungry and crying.

Counselling and support

A supportive counselling programme could go a long way towards helping a mother adhere to her infant feeding choice. However, according to several conference presentations, counselling staff are generally confused about how to counsel HIV-positive mothers about infant feeding.

According to Dr Rollins, in the South African early weaning studies "the counsellors have the very same [stressful] experience [as the mothers]. They didn't know where to go, they didn't know what to do, and it said that we have to have a much more structured set of counselling tools and awareness around this whole process."

A presentation on infant feeding counselling in Tanzania made similar observations, noting that counsellors lacked confidence and had high levels of stress and frustrations— "calling for an urgent need of update training on HIV and infant feeding, review of pre-service curriculum and provision of tangible tools (quick reference) to be used during counselling," (Leshabari).

According to the survey, the counsellors didn't know how to assess women's individual situations in order to advise mothers about which infant feeding options were best for them. But a grave finding was that the counsellors simply didn't agree with the programme recommendations — exclusive breastfeeding or exclusive formula feeding, "since both violated cultural norms... and they expressed reluctance in promoting those options perceived to be culturally unacceptable," wrote the investigators.

Another study at four sites in South Africa, Namibia and Swaziland, reported that "clients as well as counsellors have described encounters as disempowering. Counsellors experience burn-out and clients report feeling judged, blamed and stigmatised... MTCT Infant Feeding Counselling, because of its nature, is drawn into the "minefield around motherhood and sexuality" (Buskens). With such an emotionally charged issue, the results can be disastrous when counsellors are biased against one or the other infant feeding practice. It is a very common occurrence for healthcare workers to push mothers with HIV to formula feed to avoid HIV-infection, even without determining whether replacement feeding is safe or available.

Lay-counsellors, mothers and peer-support groups

Several programmes such as one described by Dr. Rollins and his colleagues in several presentations, report better results by training and using lay-counsellors rather than medical staff (for more about Dr. Rollin's work, see the presentation he made at the PATH Symposia on HIV and Infant Feeding, http://www.path.org/files/Nigel_Rollins.pdf).

Other programmes use peers, including in some cases, other mothers with HIV. Mothers 2 Mothers is a mentorship programme for pregnant women living with HIV that began in Cape Town but has now expanded into several provinces in South Africa, Botswana and Ethiopia (Aunt). The programme recruits recently delivered mothers living with HIV (currently over 200) to return to antenatal clinic as

mentors to educate, counsel and support HIV-infected pregnant women and mothers with infants (currently around 5000 per month).

According to Aunt et al, mothers with HIV “have a better understanding and greater acceptance of interventions to reduce vertical transmission. They are better able to participate in decision making with respect to mode of delivery, use of antiretroviral agents to reduce transmission and infant feeding method.”

Meanwhile, a Population Council, Horizons project in Nairobi Kenya reported some success with traditional birth attendants and HIV-positive peer counsellors who have been trained to educate and support pregnant women to know their HIV status and to adopt safer infant feeding practices (Kaai).

Finally, in the Breastfeeding Antiretroviral and Nutrition (BAN) Study in Malawi, nurses are being used for counselling; however, support groups have now been set up for breastfeeding mothers to share strategies for adhering to exclusive breastfeeding and rapid weaning (Tembo). Since 2005, 116 women have participated, and according to Tembo et al, they have generated several ideas for dealing with family or social pressures against early weaning. For example, “they feed their babies first before visiting or meeting their neighbours as hungry babies cry a lot and are pacified by breastfeeding. Thus feeding them would minimise crying and other people would not ask the mothers to breastfeed the babies, [and] they lie that they are pregnant again. Pregnant women are not encouraged to breastfeed in Malawi,” wrote Martin Tembo and colleagues.

Involving the male partner

Several reports at the World AIDS Conference stressed that, in some cultural contexts, it could be very important to involve the male partner in infant feeding decisions — especially in situations where the man is the chief decision maker in the family. Otherwise, he may forbid her to feed the child in any way that costs the family (by buying replacement feeding etc...) or goes against tradition. “Direct involvement of men in perinatal studies and PMTCT programme can aid in retention and adherence to study procedures,” wrote of the investigators of the BAN study (Chiwanda). The morbidity and mortality risks of not breastfeeding need to be explained as well to the partner as the risks of transmission from breastfeeding.

However, counselling and support systems are crucial in this context since new mothers who disclose their status are at risk of violence or abandonment (Tembo). For example, in the Breast Milk Study in Kampala, Uganda, “some women experienced domestic violence ranging from desertion, financial support withdrawal, harassment and battering following HIV status disclosure to their spouses. The violence was more marked if the infants were also HIV-infected or the husbands were HIV-negative. Some women breast fed their infants for either too long or too short compared to their plans for fear of status disclosure or HIV transmission through breastfeeding,” wrote Kagoda and Bakaki.

Improving feeding alternatives for HIV-positive mothers not breastfeeding their infants

Criteria for determining whether formula feeding is truly AFASS were discussed in part one, however, counsellors and mothers must undergo a similar process for determining whether there are adequate replacement foods to provide an infant upon weaning. “Several infants suffered from diarrhoea, malnutrition or even death following cessation of breastfeeding,” Kagoda and Bakaki noted in their study. This appears to be relatively common when quality

replacement foods are either not available or adequate (see <http://www.aidsmap.com/en/news/59415764-DC18-4383-AB43-04B312F8141A.asp>) — and when mothers are unprepared for what they will do after weaning.

“Mothers had difficulty accessing replacement milks and nutritious foods due to economic constraints and food insecurity,” said Dr Naume Tavengwa of the ZVITAMBO project who gave a presentation on early breastfeeding weaning at the Path Symposia (see http://www.path.org/files/Naume_Tavengwa.pdf). In her study, eight out of twelve mothers who planned on weaning at 6 months said that they could not afford milk, and ten out of twelve mothers said it was hard to get the variety of foods for a balanced infant diet.

Also during the PATH symposium, Dr Jean Humphrey pointed out that there really are few precedents for not breastfeeding an infant between months six and nine in rural Africa. In her presentation, she showed how a few common replacement diets (including corn meal (mielie), bananas, mashed pumpkin, etc.) were all nutritionally inadequate — though they could be improved with the addition of more milk and sugar, or when milk isn’t available, by adding more oil, sugar and peanut butter (for more detail on these examples, see http://www.path.org/files/Jean_Humphrey.pdf).

Some studies and programmes are directly providing HIV-positive mothers with free or low cost food supplements to guarantee that weaned infants get adequate nutrition. For example, a substudy of the BAN trial reported fairly good experiences using a locally produced spread made up of peanut butter, milk, oil, sugar, and micronutrients as a high energy breast milk replacement for infants (Thomas). This “ready to use” replacement food had previously been used in Malawi to treat severely malnourished children.

Other studies have used fortified flours which can be cooked up and served as gruel. For example, as part of the Kesho-Bora study of ART in breastfeeding mothers in Burkina Faso, a local flour producer and French food technologists (NUTRIFASO) collaborated to develop a locally produced AFASS baby food for weaned infants (Cames). The product contains mostly maize, groundnut and soybean flour fortified with vitamins and minerals, with added enzymes, sugar and iodised salt. Feeding the baby about two to three cups of the gruel (made from half a cup of dry flour) and two cups of milk a day should meet his or her nutritional needs. According to the poster presentation on this initiative (which can be downloaded here <http://www.mpl.ird.fr/epiprev/actu.htm>), 59 out of 63 infants actually ate the gruel.

However, there will always be some babies that will refuse to eat such replacement foods or will eat them very reluctantly — or will spit the food back up. And to this reporter, the variety of foods in Dr. Humphrey’s presentation sound more appetising.

Finally, the PMTCT programme in Haiti is pioneering adding a nutritional and educational support program for infants over nine months of age (when formula supplies end). Mothers are given monthly food rations and money (~US\$4) with which to buy other provisions as children were weaned. According to Dr Ralph Ternier and colleagues, the programme was “universally praised by the mothers”... “and was a relatively inexpensive addition to the program.”

Flash heating expressed breast milk

One often overlooked alternative feeding option is to use the mother’s own expressed breast milk once it has been heated to kill HIV. Heat treating expressed milk could prove safer than formula feeding in many settings where there is no reliable access to clean drinking water or a consistent supply of formula.

But there are problems with the two techniques — boiling and Holder pasteurisation — listed by WHO infant feeding resources. Boiling breast milk directly causes significant nutritional damage to it. Holder pasteurisation, on the other hand, is a low temperature slow heating method that has been reported to inactivate HIV while maintaining most of the milk's nutritional properties. The method involves heating the milk to 62.5 degrees Celsius for 30 minutes and has been used in breast milk banks. But this isn't a simple method that most women can do in their own homes since it requires temperature gauges and timing devices that simply aren't available in most at-risk communities.

However, several studies at the World AIDS Conference reported that a new pasteurisation technique, flash heating, could be a practical method that mothers could perform on their own stoves or over a fire.

According to Kiersten Israel-Ballard, a doctoral student at the University of California, Berkeley, the method is based upon flash pasteurisation, a technique that involves heating at 72 degrees for only 15 seconds, which is used in commercial food science because it protects the nutrients while killing pathogens more effectively than Holder pasteurisation.

In the modified flash-heating breast milk technique, mothers wash their hands with soap and water and then manually express 75-150mL of breast milk into a sterile jar such as a peanut butter, jam, or honey jar — something that a mother would already have in her home. The jar is then placed in a simple aluminium pan containing around half a litre of water. The water and the jar of milk are then heated together over very high heat. When the water — not the milk — reaches 100 degrees and is therefore at a visible rolling boil, the milk is immediately removed from the water and allowed to cool.

When testing this method, Israel-Ballard and colleagues monitored the temperature of the milk and water in 15 second intervals and found that the breast milk typically reached a peak temperature of 72.9 degrees Celsius.

So far, several studies have evaluated the safety, effectiveness and acceptability of the method. Previously, pilot safety studies found that the flash heat method was capable of inactivating HIV in spiked breast milk samples from healthy mothers while retaining most of the milk's nutritional and anti-microbial properties.

"Inactivating HIV is really just one of the issues in maintaining the safety of the breast milk," said Israel-Ballard. In one study, presented as a poster at the conference, flash heat was capable of destroying any type of contaminant that was in the milk and destroyed the growth of any such microbes for up to eight hours after flash heating when stored at room temperature (23 Celsius). In contrast, there was substantial bacterial growth (including *E.coli* and *S. aureus*) by 8 hours in unheated breast milk controls (Israel-Ballard). She also noted that the treated breast milk can be frozen and thawed once, but only once (the thawing process is destructive to milk products).

The objective of the other study Israel-Ballard presented was to confirm that flash heating was also capable of inactivating HIV in naturally infected breast milk samples from HIV positive mothers. The study recruited 84 HIV-positive lactating mothers at a PMTCT clinic in Durban, South Africa. These women provided 94 breast milk samples which were immediately placed in an ice water bath and transferred to the laboratory. 50 ml of the breast milk was aliquoted to the flash heated and the remaining volume used as a unheated control.

Only about 31% of the mothers had detectable HIV in their breast milk. After controlling for other maternal characteristics, detectable

breast milk viral load was significantly associated with low CD4 counts, increased likelihood of vitamin use and lower volumes of breast milk expressed (which is possibly a sign of mixed feeding or weaning).

30 of the 98 breast milk samples collected had detectable HIV. To determine the impact of flash heat on breast milk viral load, the unheated and flash heated aliquots of these 30 samples. The samples had a mean (sd) value of 8,078 (15,154) copies/mL; a median value of 1,895 copies/mL; and a range from 617 to 65,101 copies/mL.

After flash-heating, none of the samples showed detectable levels of HIV.

Israel-Ballard noted a number of limitations of the study, for example, the ExaVir RT assay used in the study is limited to detection of cell free virus only. Cell-free virus refers to "free-floating" virus or the parts of the virus not associated with a cell. Cell-associated virus refers to HIV that is inside a cell, and Israel-Ballard noted, "there has been data that has shown that cell-associated HIV could be the culprit for more of the transmission to the infant. We are very much concerned with this. Our virologist and our food scientist hypothesised that cell associated-infectivity would be destroyed along with the cell [by flash-heating]. Our preliminary data is promising with the cell-associated virus that we have been looking at, and we will be exploring this further."

She also noted that additional research is needed to determine if variations in milk, water volumes, jar or pan size, shapes, heating source maybe even altitude would impact the effectiveness of flash heat. "We begun to address these issues in several field conditions and we currently confirming the nutritional, immunological and anti-microbial safety."

"We have confirmatory data where we actually spiked the heating milk with high concentrations of *E. coli* and *Staph. aureus* to then see if, even after heating, if the milk were to be contaminated, are the antimicrobial properties still active. Because in raw unheated breast milk, the breast milk is like live tissue. It is antiviral, it is antimicrobial. These data are also very promising and we hope to expand upon this soon," she said.

If nutritional safety and anti-HIV activity is confirmed, Israel-Ballard believes that flash heat should be included in comprehensive infant feeding counselling.

However, the practice may not be acceptable in every culture. Israel-Ballard shared this concern and said that one of the first studies that they did was in Zimbabwe where they found that the majority of participants felt that manually expressing and heat treating breast milk could be a potentially acceptable option — given that support was provided and that the safety could be confirmed. However, during the PATH Symposia, Dr. Tavengwa reported that another group of Zimbabwean mothers said that flash-heating would not be "culturally acceptable." This indicates, at the very least, that there would have to be significant efforts to educate and reassure mothers about the process.

But it may be possible for heat treated breast milk to be used from birth (and this should be clinically evaluated given the high mortality rates reported on formula). However, Israel-Ballard believes that "it may be most feasible during times of high risk, such as mastitis and perhaps more practically during or after abrupt weaning. There are risks from the sudden onset of complimentary foods without the immune protection from breast milk. There is also the lack of adequate nutrition available that could result in malnutrition and soberingly, there is the recent data confirming the significant increase in breast milk viral load during the weaning

period, suggesting that if a mother were to breast feed during this time, the risk of transmission would actually be increased.

"Perhaps heat treated breast milk could be used during this time and could be viewed as another complimentary food – one that is HIV-free, nutritious, affordable and available."

Conclusion

Unfortunately, no infant feeding strategy will ever be without some risk, either of transmission or mortality. Still the pendulum does seem to have swung somewhat back towards recognising the importance of breastfeeding for child health, and of better defining what AFASS really means in each regional setting. It will soon be time for a policy review, as Dr Peggy Henderson, who originally proposed the AFASS criteria, herself wrote in a poster at the recent World AIDS Conference: "The evidence from recent studies and further experience in the field call for a review of current technical recommendations, once key information on antiretrovirals becomes available."

Resources

We highly recommend the presentations made at the Path Symposia on HIV and infant feeding at the World AIDS Conference (see

http://www.path.org/news/an060813_AIDSconf_infant_feeding.php)

References

Alfieri C et al. Early weaning: a challenge for mothers in Burkina Faso. Sixteenth International AIDS Conference, Toronto, Abstract CDC0540, 2006.

Aunt K, Besser M, Mbono B. Mothers 2 Mothers: Education, counseling and psychosocial support in PMTCT programs in Africa. A replicable and sustainable model for care. Sixteenth International AIDS Conference, Toronto, Abstract TUPE0696, 2006.

Bland RM et al. WHO and UNICEF infant feeding policy for HIV-positive women - how feasible is it? Sixteenth International AIDS Conference, Toronto, Abstract TUPE0342, 2006.

Buskens J. Woman's inhumanity to woman in infant feeding counseling in southern Africa. Sixteenth International AIDS Conference, Toronto, Abstract THPE0605, 2006.

Cames C et al. A sustainable baby food support for HIV-1-infected mothers. The Kesbo Bora study (KB) initiative in Burkina Faso. Sixteenth International AIDS Conference, Toronto, Abstract TUPE0356, 2006.

Chiwanda D et al. Involvement of males as a strategy to increase accrual, retention and adherence in clinical trials - BAN study experience. Sixteenth International AIDS Conference, Toronto, Abstract TUPE0667, 2006.

de Paoli MM, Mkwana DB, Rollins NC. Rapid cessation of breastfeeding - a safe and feasible PMTCT strategy? Sixteenth International AIDS Conference, Toronto, Abstract CDC0535, 2006.

Henderson P, Vallenat C. Making infant feeding counselling work in the context of HIV/AIDS. Sixteenth International AIDS Conference, Toronto, Abstract CDC0529, 2006.

Israel-Ballard K et al. Assessing storage safety of flash-heated breast milk as an infant feeding option for HIV positive mothers in

developing countries. Sixteenth International AIDS Conference, Toronto, Abstract TUPE0341, 2006.

Israel-Ballard K et al. Viral safety of flash-heated breast milk as an infant feeding option for HIV positive mothers in developing countries. Sixteenth International AIDS Conference, Toronto, abstract THAC0103, 2006.

Kaai S et al. Infant feeding counseling and practice among HIV-positive urban poor PMCT clients in Nairobi, Kenya. Sixteenth International AIDS Conference, Toronto, Abstract CDC0536, 2006.

Kagoda B, Bakaki P. Health and socio-economic experiences of HIV-infected women and their infants in the era PMTCT: case reports from the breast milk study. Sixteenth International AIDS Conference, Toronto, Abstract CDC0577, 2006.

Leroy V et al. 18-month effectiveness of short-course perinatal antiretroviral regimens combined to infant-feeding interventions for PMTCT in Abidjan, Côte d'Ivoire. DITRAME PLUS ANRS 1201/1202 2001-2005. Sixteenth International AIDS Conference, Toronto, Abstract MoPB2007, 2006.

Leshabari S et al. Counselling on HIV and infant feeding: the experiences and challenges faced by nurse counsellors in northern Tanzania. Sixteenth International AIDS Conference, Toronto, Abstract TUPE0785, 2006.

Makin JD et al. Choosing to formula or breastfeed: factors affecting women's choice of infant feeding in Pretoria, South Africa. Sixteenth International AIDS Conference, Toronto, Abstract CDD0864, 2006.

Tembo M et al. Women's experiences and lessons in HIV-infected mothers social support groups. Sixteenth International AIDS Conference, Toronto, Abstract THPE0624, 2006.

Ternier R et al. Nutritional support for infants of non-breastfeeding, HIV-positive mothers. Sixteenth International AIDS Conference, Toronto, Abstract THPE0185, 2006.

Thomas RM et al. Evaluation of mothers' experiences using a ready-to-use therapeutic food to aid in early breastfeeding cessation of infants of HIV-infected mothers: the BAN study in Lilongwe, Malawi. Sixteenth International AIDS Conference, Toronto, Abstract CDC0526, 2006.