

# Infant feeding practices and attitudes among women with HIV infection in northern Thailand

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**Abstract** Knowledge and attitudes towards infant feeding among women in northern Thailand were examined. Face-to-face interviews using structured questionnaires were undertaken in three districts of Chiang Rai province. Subjects included postnatal women with HIV infection (group 1, n = 80), antenatal women with HIV infection (group 2, n = 36) and antenatal women with unknown HIV status (group 3, n = 86). Advantages of breastfeeding and formula feeding according to several characteristics (convenience, cleanliness, cheapness and safety) were rated using a four-point (0–3) scale. Overall, breastfeeding was rated much higher (11.4/12) than formula feeding (6.1/12) ( $p < 0.0005$ ). Formula feeding rating was highest among postnatal women with HIV infection (6.8/12); however, it was lower than the rating for breastfeeding (11.3/12). The vast majority of women with HIV infection were either formula feeding (group 1, 94%) or intended to formula feed (group 2, 72%) their infants. In contrast, the vast majority of antenatal women of unknown HIV status planned to breastfeed (group 3, 83%). All women, regardless of HIV status, consider breastfeeding to be more advantageous than formula feeding. However, once women with HIV infection are informed of the risk of HIV transmission through breastfeeding, they are able to make their own decision to follow the Thai Ministry of Public Health's recommendation to formula feed.

## Introduction

Breastfeeding transmission is accountable for about one-third of mother-to-child transmission of HIV in developing countries (Mofenson 1997; Nicoll *et al.*, 2000). In developed countries, women with HIV infection are recommended not to breastfeed their children; however, in developing countries, the risk of postnatal HIV transmission has to be balanced against the risk of morbidity and mortality associated with formula feeding (Nicoll *et al.*, 2000; WHO, 2000).

While continuing to support the UNICEF Baby-friendly initiative and to promote universal breastfeeding, the Ministry of Public Health (MOPH) of Thailand has recom-

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mended formula feeding for infants born to mothers with HIV infection since 1993 and has provided free formula to the poorest fraction of the population (Kanshana & Kullerk, 1998). Some authors, however, have raised concerns about a possible risk of spillover of the formula feeding policy to the general population and about the risk of discrimination of mothers with HIV infection since formula feeding may identify them as HIV-infected (Coutsoudis *et al.*, 1999).

As zidovudine (ZDV) prophylaxis has proved efficacious in reducing mother-to-child HIV transmission (MCT) (Dabis *et al.*, 1999; Lallemand *et al.*, 2000; Shaffer *et al.*, 1999; Wiktor *et al.*, 1999), public health interventions to prevent perinatal transmission are being implemented in Thailand (Thaineua *et al.*, 1998). Their success will depend not only on antiretroviral availability, but also on public knowledge of HIV/AIDS, attitudes towards HIV testing, and towards infant feeding. In this paper, we report the results of a survey in northern Thailand, in which we assessed the knowledge, attitudes and practices regarding infant feeding in the context of HIV. We have interviewed three groups of women: antenatal and postnatal women with HIV infection and antenatal women of unknown HIV status.

## Methods

The study was conducted at two district hospitals (Mae Chan Hospital, Mae Sai Hospital), one provincial hospital (Chiang Rai Hospital) and in health centres (Mae Chan district) in Chiang Rai province, northern Thailand. At the time the study was performed (1998), the antenatal HIV prevalence was estimated at 10.8% in the study hospitals (Le Coeur *et al.*, 1999). In these hospitals, pregnant women are routinely offered HIV testing and informed consent is required. Pre-test group counselling is provided at the first antenatal visit. Acceptance rates for HIV testing are extremely high in northern Thailand, in the order of 99% (Thaineua *et al.*, 1998). During individual post-test counselling sessions HIV-positive women are advised not to breastfeed their baby. In northern Thailand, access to antenatal care is estimated at more than 80% (Kieffer, 2001).

From January to March 1998, three groups of women were enrolled into the study after informed consent: 80 women with HIV infection who had delivered and were attending well baby clinics (group 1); 36 pregnant women with HIV infection in antenatal care (ANC) who had received at least one session of post-HIV test counselling (group 2); and 86 pregnant women of unknown HIV status, after pre-test counselling and testing but before they had received their HIV test results (group 3). In the three groups, women were selected sequentially.

Two trained Thai health care workers interviewed the women. An interpreter was needed for some interviews with Hilltribe and Burmese women. Baseline data on sociodemographic characteristics, HIV/AIDS knowledge and attitudes toward infant feeding were collected. For modes of feeding (breast, formula), four characteristics were investigated: convenience, cleanliness, cheapness and safety. In order to grade the perceived advantages of formula feeding and breastfeeding for these four characteristics, we designed a four-point scale with the answer no advantage rating 0, little advantage rating 1, some advantage rating 2 and most advantage rating 3.

The overall rates for breastfeeding and formula feeding were compared using the *t*-test. The Kruskal-Wallis test was used to compare the rates among the three study groups. Finally, the percentages of responses in the three study groups were compared using the chi-square test. Descriptive content analyses were used for open-ended questions.

**Table 1.** Infant feeding advantage rating among the three groups

	Group 1 (n = 80)	Group 2 (n = 36)	Group 3 (n = 86)	Total (n = 202)	p <sup>a</sup>
Infant feeding advantage ratings <sup>b</sup>					
Breastfeeding					
Convenience	2.8	2.7	2.8	2.8	NS
Cleanliness	2.8	2.8	2.9	2.8	NS
Cheapness	2.9	3.0	2.9	2.9	NS
Safety	2.9	2.8	2.9	2.9	NS
Combined score	11.3	11.3	11.4	11.4	NS
Formula Feeding					
Convenience	2.0	1.7	1.8	1.9	NS
Cleanliness	2.1	1.9	1.9	2.0	NS
Cheapness	0.7	0.5	0.4	0.5	NS
Safety	2.1	1.8	1.5	1.8	0.002
Combined score	6.8	5.9	5.5	6.1	0.02

<sup>a</sup> Value for inter-group differences; <sup>b</sup> rating: 0 = no advantage; 1 = little advantage; 2 = some advantage; 3 = most advantage.

**Results**

Of the 202 women interviewed, the majority were Thai (67%), although Hilltribe (17%) and Burmese (16%) ethnic groups were also included. About half of the women were working, with labourer (25%), agricultural worker (11%) and commercial activities (8%) being the most common employment categories. The vast majority of women were either married (65%) or in de facto relationships (26%). Thirty-six per cent of women had never attended school, 55% attended elementary school only, the others having either secondary or higher level of education. Fifty-two per cent of the women were multiparous; however, women with HIV infection (groups 1 and 2) were more likely than women of unknown HIV status (group 3) to be in their first pregnancy (OR = 2.2, 95% CI = 1.2–4.0). The previous breastfeeding experience of the multiparous women was not assessed.

For breastfeeding, the mean advantage rating for each characteristic examined (convenience, cleanliness, cheapness and safety) was high and close to the maximum (2.8, 2.8, 2.9 and 2.9, respectively)(Table 1). The combined rates for each of the three groups of women were also similar (11.4 for group 1, 11.3 for group 2 and 11.4 for group 3). In contrast, for each characteristic, formula feeding was rated much lower (1.9, 2.0, 0.5 and 1.8, respectively), and the combined scores differed significantly among the three groups ( $p = 0.02$ ): postnatal women with HIV infection (group 1), rated formula feeding the highest (combined score 6.8 in group 1 versus 5.9 in group 2 and 5.5 in group 3), and the score for ‘safety’ in this group was significantly higher than in the two others (2.1 versus 1.8 in group 2 and 1.5 in group 3). For each characteristic, breastfeeding was considered more advantageous than formula feeding ( $p < 0.0005$  for each).

Reporting of circumstances when women would not breastfeed differed among the study groups (Table 2). Women with HIV infection (groups 1 and 2) were much more likely to identify HIV infection as a reason not to breastfeed than women of unknown HIV status (group 3)(74% versus 27%;  $p < 0.0001$ )(Table 2). Almost all women (99%) agreed that in general breastfeeding is best for infants; however, 95% agreed that women with HIV infection should not breastfeed their child (Table 2).

**Table 2.** Attitudes towards infant feeding among the three groups

	Group 1 (n = 80)	Group 2 (n = 36)	Group 3 (n = 86)	Total (n = 202)	p <sup>a</sup>
Under what circumstances should mothers not breastfeed? (%) <sup>b</sup>					
No breast milk	31.3	30.6	48.8	38.6	0.01
Not enough breast milk	17.5	22.2	32.6	24.8	0.03
Not healthy	33.8	27.8	32.6	32.2	NS
Work outside home	22.5	27.8	37.2	29.7	0.04
Has HIV infection	77.5	66.7	26.7	54.0	< 0.00001
Do not know	3.8	5.6	3.5	4.0	NS
Others	7.5	8.3	17.4	11.9	0.04
HIV-infected mothers should not breastfeed their infants (%)					
Agree	93.7	94.6	96.5	95.0	NS
In general breast milk is best for infants (%)					
Agree	98.7	100	98.8	99.0	NS

<sup>a</sup> Value for inter-group differences; <sup>b</sup> More than one answer possible.

Several questions were asked concerning opinions on mothers who formula feed their infants. The majority of women (71%) said formula feeding could indicate that mothers were working outside the home, and almost half (45%) thought formula feeding could indicate that mothers were HIV-infected. Women with HIV infection (groups 1 and 2) were slightly, but not significantly, more likely than women of unknown HIV status (group 3) to believe the latter.

Ninety-four per cent ( $n = 75$ ) of postnatal women with HIV infection (group 1) exclusively formula fed their baby, 5% ( $n = 4$ ) fed their child both breast milk and formula milk and only one woman exclusively breastfed her child. The reasons these women gave for formula feeding were: recommended by their doctor (40%), HIV infection (27%), prevention of MCT (18%) or other reasons (14%).

Eighty-three per cent of antenatal women of unknown HIV status (group 3) wanted to breastfeed their child after delivery, 7% planned to breastfeed and formula feed, 5% had not decided yet and only 5% planned to exclusively formula feed. In contrast, only 25% of antenatal women with HIV infection (group 2) planned to breastfeed after delivery, 72% planned to formula feed and 3% planned to breastfeed and formula feed. The reasons given by women who planned to formula feed were their HIV-positive status, their doctor's recommendation and prevention of MCT.

Among postnatal women with HIV infection (group 1), 87% had originally planned to breastfeed. However, following their HIV diagnosis the percentage dropped to 6%. Ninety-five per cent of women in this group reported being advised to formula feed, generally by health professionals. Initially, after receiving this advice, most women (66%) worried that they could not afford formula milk. In addition, they felt sorry that they could not breastfeed their child and were afraid that someone would ask why they were not breastfeeding or that someone would uncover their HIV status. However, after they began formula feeding, their level of anxiety decreased, and they were comforted by the fact that they could help prevent transmission of HIV to their child.

Eighty-seven per cent of postnatal women with HIV infection (group 1) were asked by members of their community why they were formula feeding. Of these, 27% answered directly that they were HIV-positive, while 73% answered that either their doctor had recommended formula feeding or their breast milk was insufficient.

## Discussion

Our study provides evidence of a strong belief that breastfeeding is more advantageous than formula feeding among women in northern Thailand. Despite this strong belief, there is a high level of compliance with the Thai MOPH recommendation that women with HIV infection should formula feed their infant; this is evident in the intended and actual rates of formula feeding among antenatal and postnatal women with HIV infection, respectively. This may indicate high quality post-test counselling in the antenatal care setting in northern Thailand.

There are several limitations in the study methodology that require consideration when interpreting the findings. Information was gathered through face-to-face interviews and thus includes the possibility of both self-reporting and interviewer bias. Prevailing social norms and a perception of possible stigmatization may have influenced responses. Women were not selected randomly, but we believe that our sequential selection method did not introduce major bias. Sociodemographic characteristics of women of unknown HIV status (group 3) were similar to those of all women coming for antenatal care in these hospitals between June 1997 and December 1998 (Le Coeur *et al.*, 1999). Similarly, women with HIV infection coming for their antenatal follow-up were comparable to all women with HIV infection attending the same hospitals between June 1997 and December 1998 and screened for HIV during pregnancy (Le Coeur *et al.*, 1999). However, the group of women with HIV infection attending the well baby clinic may have been biased towards formula feeding since hospital-based postnatal clinics are the distribution points for formula milk. This group of women may not be representative of all postnatal women with HIV infection. Finally, misinterpretation of some aspects of the questionnaire appears to have been present. Questions in which multiple responses were possible were often answered by a single response. Although interpreters were used with Hilltribe and Burmese women who could not speak Thai, language difficulties may have contributed to this apparent misinterpretation.

In our study, breastfeeding was considered much more advantageous than formula feeding. Although unverifiable, this may reflect the success of the UNICEF baby-friendly initiative introduced in 1991 (UNICEF, 1995). The advantage of breastfeeding over formula feeding was greatest for the characteristic of 'cheapness', but was also considerable for 'safety', 'convenience' and 'cleanliness'. Despite the higher advantage rating for breastfeeding, including 'safety', most antenatal women with HIV infection planned to formula feed, and nearly all postnatal women with HIV infection were formula feeding their infants. In contrast, the vast majority of postnatal women with HIV infection had planned to breastfeed prior to knowledge of their HIV status, and the vast majority of antenatal women of unknown HIV status planned to breastfeed. These data demonstrate widespread uptake of the Thai MOPH recommendation that all women with HIV infection should formula feed their infants.

HIV status had a limited influence on perception of formula feeding, with slightly higher ratings for 'safety' and for the combined rating. The possible recruitment bias could explain partly the fact that postnatal women with HIV infection gave the highest rating for formula feeding, however it is more likely explained by a reinforcement of the HIV prevention advantage of formula feeding through actual feeding. It is interesting to observe that only one-quarter of women of unknown HIV status (the group of women closest to women in the general population) mentioned HIV infection as a reason not to breastfeed, whereas other reasons such as the absence or insufficiency of breast milk, a disease or a job outside home were more popular responses. In contrast, women with HIV infection, who are particularly sensitive about this issue, gave HIV infection as the main reason for not breastfeeding. This

suggests that even though the potential for discrimination exists, formula feeding is associated with many other reasons that have no negative connotation.

When asked why they were not breastfeeding, 27% of the postnatal women responded that it was because they were HIV-positive. Although discrimination is still a concern for many women in northern Thailand, others are quite open about their HIV status. Indeed, through NGOs, people with HIV/AIDS (PWA) groups, and community participation programmes a high level of community acceptance of people with HIV has been achieved in northern Thailand (Supawitkul, 2001).

Very limited literature exists on the knowledge and attitudes towards infant feeding specifically among women with HIV infection. As in this study, previous research among the general Thai maternal population has shown that breastfeeding is the preferred method of infant feeding (Jackson *et al.*, 1992; Soawakontha *et al.*, 1995; Yimyam, 1998).

The cultural diffusion theory raises the potentiality that a loss of confidence in breastfeeding will spread to the general population. Our study clearly demonstrates that knowledge of transmission of HIV through breastfeeding does not change women's preference for breastfeeding, a finding in opposition with cultural diffusion theory (Coutsoudis *et al.*, 1999). It also shows that most women with HIV infection clearly choose to protect their children from HIV despite knowledge of the disadvantages of formula milk relative to breast milk and the potential for discrimination. Finally, our study shows that women with HIV infection are able to respond positively to potentially discriminative attitudes such as questions about their mode of feeding. Therefore, formula feeding programmes targeted towards women with HIV infection do not negatively impact efforts to promote breastfeeding. Now that interventions to reduce mother-to-child transmission of HIV with antiretroviral therapy are implemented, such recommendations should be considered in regions where HIV prevalence is high and where formula feeding can be safely implemented.

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## References

- COUTSOUDIS, A., PILLAY, K., SPOONER, E., KUHN, L. & COOVADIA, H.M., FOR THE SOUTH AFRICAN VITAMIN A STUDY GROUP (1999). Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study. *Lancet*, 354, 471–476.
- DABIS, F., MSELLATI, P., MEDA, N., WELFFENS-EKRA, C., YOU, B. & MANIGART, O. *ET AL.* (1999). Six-month efficacy, tolerance, and acceptability of a short regimen of oral zidovudine to reduce vertical transmission of HIV in breastfed children in Cote d'Ivoire and Burkina Faso: a double-blind placebo-controlled multicentre trial. DITRAME Study Group. *Lancet*, 353, 786–792.
- JACKSON, D.A., IMONG, S.M., WONGSAWASDI, L. *ET AL.* (1992). Weaning practices and breast-feeding duration in Northern Thailand. *British Journal of Nutrition*, 67, 149–164.
- KANSHANA, S. & KULLERK, N. (1998). *Situation analysis: current interventions to reduce vertical transmission of HIV in Thailand*. UNICEF office for Thailand.
- KIEFFER, M.P. (2001). Challenges and opportunities for starting and scaling up programs to prevent mother to child transmission in the Asia and Pacific Region. 6th International Congress on AIDS in Asia and the Pacific, Melbourne, October 5–10.
- LALLEMANT, M., JOURDAIN, G. & LE CŒUR, S. *ET AL.* (2000). A trial of shortened zidovudine regimens to prevent mother-to-child transmission of Human Immunodeficiency Virus 1. *New England Journal of Medicine*, 343, 982–991.

- LE CŒUR, S., PRASITWATTANASERE, S., SEUBMONGKOLCHAI, R., JOURDAIN, G., LALLEMANT, M. & THE PHPT GROUP, THAILAND (1999). Sociodemographic characteristics associated with HIV-infection in pregnant women in Thailand. 5th International Congress on AIDS in Asia and the Pacific, Kuala Lumpur, October 20–26 [abstract 721].
- MOFENSON, L.M. (1997). Mother-child HIV-1 transmission: timing and determinants. *Obstetrics & Gynecology Clinics of North America*, 24, 759–784.
- NICOLL, A., NEWELL, M.L., PECKHAM, C., LUO, C. & SAVAGE, F. (2000). Infant feeding and HIV-1 infection. *AIDS*, 14(Suppl. 3), S57–S74.
- SHAFFER, N., CHUACHOOWONG, R., MOCK, P.A., BHADRAKOM, C., SIRIWASIN, W. & YOUNG, N.L. ET AL. (1999). Short-course zidovudine for perinatal HIV-1 transmission in Bangkok, Thailand: a randomised controlled trial. Bangkok Collaborative Perinatal HIV Transmission Study Group. *Lancet*, 353, 773–780.
- SOAWAKONTHA, S., CHANTRAPHOSRI, V., KAMPOR, P. ET AL. (1995). Breastfeeding behavior and supplementary food pattern of villagers in Udon Thani Province, northeast Thailand. *Southeast Asian Journal of Tropical Medicine & Public Health*, 26, 73–77.
- SUPAWITKUL, S., SINSOMBOONTONG, S., SUPAWITKUL, B. & KHAMSAEN, N. (2001) Scaling up community-based AIDS program in Chiang Rai: concepts, implementations, results, constraints, and keys of success. 6th International Congress on AIDS in Asia and the Pacific, Melbourne, October 5–10 [Abstract 1920].
- THAINEUA, V., SIRINIRUND, P., TANBANJONG, A., LALLEMANT, M., SOUCAT, A. & LAMBORAY, J.L. (1998). From research to practice: use of short course zidovudine to prevent mother-to-child HIV transmission in the context of routine health care in Northern Thailand. *Southeast Asian Journal of Tropical Medicine & Public Health*, 29, 429–442.
- UNICEF (1995). *Baby-friendly hospital initiative handbook*. CF/PROG/IC/95–005.
- WHO (2000). New data on the prevention of mother-to-child transmission of HIV and their policy implications. WHO technical consultation on behalf of the UNFPA/UNICEF/WHO/UNAIDS Inter-Agency Task Team on Mother-to-Child Transmission of HIV. Geneva, October 2000 (available at [http://www.unaids.org/publications/documents/mtct/MTCT\\_Consultation\\_Report.doc](http://www.unaids.org/publications/documents/mtct/MTCT_Consultation_Report.doc))
- WIKTOR, S.Z., EKPINI, E., KARON, J.M., NKENGASONG, J., MAURICE, C. & SEVERIN, S.T. ET AL. (1999). Short-course oral zidovudine for prevention of mother-to-child transmission of HIV-1 in Abidjan, Cote d'Ivoire: a randomised trial. *Lancet*, 353, 781–785.
- YIMYAM, S. (1998). Breastfeeding, work and women's health among Thai women in Chiang Mai. *Breastfeeding Review*, 6, 17–22.