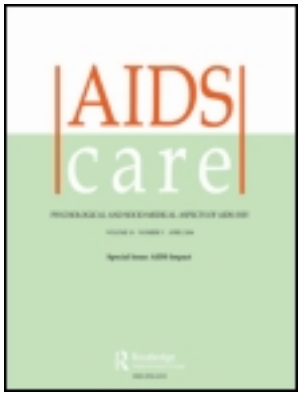

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Infant-feeding pattern of HIV-positive women in a prevention of mother-to-child transmission (PMTCT) programme

Regina E. Oladokun [a] , Biobele J. Brown [a] & Kikelomo Osinusi [a]

[a] Department of Paediatrics , University College Hospital , Ibadan , Nigeria

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Infant-feeding pattern of HIV-positive women in a prevention of mother-to-child transmission (PMTCT) programme

Regina E. Oladokun*, Biobele J. Brown and Kikelomo Osinusi

Department of Paediatrics, University College Hospital, Ibadan, Nigeria

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Objectives. To evaluate the infant-feeding choices, practices and possible determinants among HIV-positive women enrolled in a prevention of mother-to-child transmission programme in Ibadan, Nigeria. *Methods*. A cross-sectional survey involving HIV-positive women who had received infant-feeding counselling prior to delivery. A structured questionnaire was administered at $\leq$ 72 hrs and not $\geq$ 6 weeks of delivery and was complemented with an in-depth interview. *Results*. A total of 241 women were studied. The choice of infant feeding was formula for 223 (93.5%) and in actual practice, 9 (3.7%) mothers admitted mixed feeding. There was no statistical significant difference between the feeding pattern and the socio-demographic characteristics. The major factor influencing the choice of infant feeding was ''The desire to reduce the risk of transmission'' which was recorded among 204 (84.6%) of the women. Greatest support in maintaining infant-feeding option was the spouse (36.1%). From the in-depth interview of 23 non-breastfeeding (infant formula) mothers, the major challenge faced was stigmatisation. *Conclusion*. Despite the premium placed on breastfeeding in this locality, with infant-feeding counselling, most HIV-positive women chose and practiced formula feeding. It is necessary to address how best HIV-positive mothers could handle or overcome criticisms and stigmatisation by others.

Keywords: infant feeding; HIV-positive women; counselling; breastfeeding; formula feeding; Nigeria

Introduction

It is estimated that 1700 infants are born with HIV everyday (UNICEF state of the world's children, 2007). The major source of HIV infection in young children is mother-to-child transmission (MTCT). The virus may be transmitted during pregnancy, labour and delivery, or by breastfeeding (Douglas & King, 1992).

In the absence of any intervention, MTCT rates of HIV can vary from 15 to 30% without breastfeeding. However breastfeeding has been shown to be associated with increased rates of 35–45% in the developing world (De Kock et al., 2000). Breastfeeding has been consistently shown to reduce infant and child morbidity and mortality by protecting against diarrhoeal diseases, acute respiratory tract infections and other infections (WHO collaborative study team on the role of breastfeeding on the prevention of infant mortality, 2000).

Nevertheless, transmission of HIV from mother to child through breastfeeding has been well established. A randomised controlled trial comparing breastfeeding with formula feeding in Nairobi reported higher transmission rates associated with breastfeeding (Nduati et al., 2000). Another study carried out in Uganda which evaluated the impact of the different modes of feeding on HIV transmission also found that exclusive breastfeeding was associated with an increased risk of HIV transmission in comparison with formula feeding (Magoni et al., 2005).

The Nigerian national recommendation which was based on international guidelines on infant feeding in the context of HIV infection states that ''when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first months of life'' (FMOH, 2006; WHO/UNICEF/UNAIDS/UNFPA, 2003). The International feeding guidelines are challenging and difficult. This is particularly so in communities where breastfeeding is the norm as obtained in Nigeria (Lawoyin, Atwood, & Olawuyi, 2001; National Population Commission, 2004) which has been corroborated by reports from other countries in sub-Saharan Africa (de Paoli, Manongi, & Klepp, 2002; Leroy et al., 2007; Leshabari, Koniz-Booher, Åstrøm, de Paoli, & Moland, 2006).

Though replacement feeding prevents breast milk transmission of HIV, there are drawbacks especially in resource-poor settings which include the risk of death from diarrhoea and malnutrition (WHO collaborative study team on the role of breastfeeding on

*Corresponding author. Email: ginaoladokun@yahoo.com

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the prevention of infant mortality, 2000). In addition to increased mortality and morbidity associated with replacement feeding, it is costly (de Paoli, Manongi, & Klepp, 2004). Social issues including stigmatisation may also result in grave consequences for the HIV-positive mother who opts not to breastfeed (Omari, Luo, Kankasa, Bhat, & Bunn, 2003).

The associated stigma increases the risk of mixed feeding. Hence, debates on infant feeding in the context of HIV infection continue in the developing world.

Preble and Piwoz (1998) had rightly observed that "The successful adaptation and application of responsible policies and guidelines on infant feeding in settings where women are at risk of HIV will be hindered until more is learned about the complex factors affecting infant feeding decisions and their impact on child survival in resource poor settings".

There is currently a lot of debate and dilemma created by the risks and benefits of breastfeeding by an HIV-positive mother especially in the developing countries. Feeding of the HIV-exposed infant in a culture where a high premium is placed on breastfeeding is therefore a great challenge. For effective care and support of HIV-positive mothers and their infants, it is necessary to identify areas in which to intensify counselling in order to meet cultural needs and prevent stigmatisation.

There is paucity of data on infant-feeding practices among HIV-positive women in Nigeria. This study was carried out to evaluate the infant-feeding pattern and possible determinants among HIV-positive mothers participating in a prevention of mother-to-child transmission (PMTCT) programme in Ibadan and the challenges that they faced as a result of their infant-feeding choices and practices.

Subjects and methods

The study was cross-sectional and descriptive in design and part of a prospective cohort of HIV-positive women enrolled for Nevirapine trial for PMTCT sponsored by AIDS Prevention Initiative of Nigeria (APIN). The study took place at the University College Hospital, Ibadan, and all the women had received pre- and post-test counselling on HIV/AIDS and infant-feeding options before delivery. There was emphasis on the benefits and the risks of the different infant-feeding options and the dangers inherent in mixed feeding.

After obtaining informed consent, a structured questionnaire was administered to the mothers. The data obtained included the socio-demographic information such as maternal age, parity, marital status, education, husband's HIV status, disclosure of test result to partner and other persons. Infant data included weight, gestational age at delivery, mode of delivery and birth order. The aspect of the questionnaire on choice of infant feeding was administered within 72 hours after delivery and the later part on the actual practice and challenges was administered to the mothers during follow up visits within a minimum of six weeks and maximum of three months.

In order to examine more closely, the constraints to implementation of infant-feeding guideline by HIV-positive women, from the initial sample of 241, 23 women were further interviewed using another semi-structured questionnaire which included information on explanations given for not breastfeeding, occasions during which there were pressures to breastfeed and the advice to other HIV-positive women to enable them cope with stigmatisation. The additional inclusion criterion for this smaller group of women who participated in the in-depth interview was practice of formula feeding. Ethical approval was obtained from the University of Ibadan/University College Hospital ethical committee.

Data management

Data entry and analysis were conducted using SPSS version 11 software. Proportions and means were used for descriptive data. Chi square test was used to determine whether there were statistical differences and associations between the socio-demographic variables and the infant-feeding choices and practices. Significance levels were set at $p < 0.05$.

Results

The study took place between August 2006 and September 2007. A total of 241 mothers were interviewed.

Socio-demographic characteristics

Table 1 shows the socio-demographic characteristics of the participants. The mothers' ages ranged between 18 and 42 years with the mean age of 29.3 years ($\pm$4.4 yrs).

One hundred and ninety (78.8%) had at least a secondary education. The number of mothers in monogamous family settings was 192 (79.7%), while 49 (20.3%) were in polygamous settings. Primi gravida constituted 42.7%.

HIV status of spouse and notification

The HIV status of 86 (35.7%) partners was negative. The sero-concordance rate was difficult to compute as the HIV status of 87 husbands (36.1%) was

Table 1. Socio-demographic characteristics of mothers.

Characteristics	No. of participants ($N = 241$)	Percentage (%)
Age		
20–24	30	12.4
25–29	91	37.8
30–34	87	36.1
≥35	33	13.7
Religion		
Christian	161	66.8
Moslem	80	33.2
Level of education		
None	10	4.1
Primary school	41	17.1
Secondary school	111	46.1
Post-secondary	79	32.8
Marital status		
Married	230	95.4
Single	7	2.9
Separated	4	1.7
Parity		
1	103	42.7
2	55	22.8
3	46	19.1
>3	37	15.3
Family setting		
Monogamous	192	79.7
Polygamous	49	20.3
Partner disclosure		
Yes	188	78.0
No	53	22.0
Partner status		
Negative	86	35.7
Unknown	87	36.1
Positive	59	24.5
Dead	9	3.7

unknown. Nine deaths (3.7%) were recorded among the partners while 59 (24.5%) were positive. One hundred and eighty-eight (78%) of the women had notified their partners about their HIV status; of these, 94% received partner support. In addition, 36 (39.6%) of the women informed others apart from their husbands. These individuals included relatives, friends and pastors.

Among the infants, there were 141 (58.5%) females. The mean birth weight was 2.92 kg (SD 0.52 kg), range 1.45–4.5 kg. Low birth weight babies (<2.5 kg) were 37 (15.4%). The mean gestational age was 38.95 wks (SD 1.86 wks), range 30–43 wks. Fifty-one infants (21.2%) were preterm, 183 (75.9%) term while only 7 (2.9%) were post-term.

Choice and practice of infant feeding

The choice of infant feeding was infant formula in 223 (92.5%) of the women and exclusive breastfeeding in 15 (6.2%). The remaining three women had opted to mix feed including two who had twins. In actual terms, 24 (10%) practiced breastfeeding in contrast to the 15 (6.2%) who chose to do so while 9 (3.7%) admitted mixed feeding their infants in contrast to the 3 (1.2%) who chose to do so (Table 3). There was no statistical significant difference between the women's choices and their practice ($p > 0.05$).

None of the mothers' or infants' characteristics shown in Tables 1 and 2 was significantly associated with the choice or practice of infant feeding.

Feeding practice and HIV status of infants

In the analysis of the HIV status of the infants, 215 (89.2%) had available and conclusive DNA PCR results at six weeks. The remaining 26 (10.8%) infants were excluded. The number of positive infants was 16 (7.4%). Table 4 shows that out of 16 positive infants, 14 (7.5%) practiced exclusive formula feeding, 2 (22.2%) mixed feeding and none was in the exclusive breastfeeding group. The association between the feeding practice and HIV status at six weeks was not statistically significant ($p = 0.112$).

Factors influencing infant feeding choice

From Table 5, the major factor influencing the choice of infant feeding was "The desire to reduce the risk of transmission" which was recorded among 204 (84.6%) of the women. Greatest support in maintaining infant-feeding option was from the partner in 87 (36.1%) and mother 51 (21.2%).

The challenges faced by the women in practicing their chosen infant-feeding option are presented in Table 6. Stigmatisation accounted for 113 (46.9%),

Table 2. Infant characteristics.

Characteristics	No.	Percentage (%)
Sex		
Male	100	41.5
Female	141	58.5
Birth weight		
<2.5 kg	37	15.4
2.5 to <4 kg	197	81.7
≥4 kg	7	2.9
Gestational age		
Preterm (<38 wks)	51	21.2
Term (38 to ≤42 wks)	183	75.9
Post-term (>42 wks)	7	2.9

Table 3. Choice and practice of infant feeding among the study population.

Feeding pattern	Choice no. (%)	Practice no. (%)
EFF	223 (92.5)	208 (86.3)
EBF	15 (6.2)	24 (10.0)
MF	3 (1.2)	9 (3.7)
Total	241	241

Note: EFF, exclusive formula feeding; EBF, exclusive breastfeeding; MF, mixed feeding.

91 (37.8%) reported no challenges faced in practicing their infant-feeding options.

Sub-sample study

Among the 23 women whose babies were fed on infant formula that participated in the in-depth interview, the socio-demographic characteristics were similar to the larger study group. The major challenge they faced was stigmatisation and the greatest pressure to breastfeed was during the traditional naming ceremony which takes place on the eighth day of life of a newborn child in the south-western part of Nigeria. Some of the explanations they gave to people who had enquired about why they were not breastfeeding were as follows; "I have germs in my breast", "Health workers advised against breastfeeding", "I am taking a drug that will affect the baby", "Because of the operation that I had for the delivery", "I am not lactating enough".

Their advice to other HIV-positive women in the same dilemma included telling lies to cover up why they were not breastfeeding and some others advised that the support of spouses should be elicited.

Discussion

HIV-positive women should be informed clearly about the different infant-feeding options and health care providers and counsellors should support these mothers irrespective of the feeding option of their choice. Majority of the HIV-positive women (92.5%) opted for formula feeding despite the premium placed on breastfeeding in this locality. Going by the feeding choices and practices reported, it may be deduced that the results were a direct reflection of the infant-feeding counselling received by HIV-positive women in the PMTCT programme though the study did not set out to test the effectiveness of infant-feeding counselling. Therefore, efforts should be made then to make breast milk substitutes safer, and more affordable. In a study in Tanzania, de Paoli et al. (2004) investigated pregnant women's views on infant-feeding options recommended for HIV-infected women, the feeding intentions of majority (82%) was infant formula provided was recommended by health workers and distributed free of charge. Similarly, a qualitative study that accessed the acceptability, feasibility, affordability, safety and sustainability of replacement feeding options for HIV-infected mothers in Ile-Ife, in south-west Nigeria, reported that for infants of HIV-infected mothers, the majority of the respondents perceived infant formula to be preferable to exclusive breastfeeding because of the risk of contracting HIV through breastfeeding. It was explained that the mother should choose infant formula to reduce the chances of her infant contracting the disease (Abiona et al., 2006). There were concerns in the above-mentioned study about affordability of the infant formula. Having recognised that infant feeding in the context of HIV goes beyond affordability, Breast Milk Substitute (BMS) support in the programme was available for those who opted for replacement feeding and were accessed to have the capability to practice it appropriately (FMOH, 2006). The women were not informed during counselling that they would be supplied infant formula so as not to bias their feeding choice. Though there was a discrepancy between the infant feeding choices which were made

Table 4. Infant-feeding practice and HIV status.

Feeding practice	HIV positive	HIV negative	Total
EBF	0 (0%)	19	19
EFF	14 (7.5%)	173	187
MF	2 (22.2%)	7	9
Total	16 (7.4%)	199	215

$p = 0.112$.

Table 5. Factors influencing infant-feeding choice.

Factor	No.	Percentage (%)
To reduce risk of transmission	204	84.6
Finances	12	5.0
Health worker influence	7	2.9
Others	8	3.3
Total	241	100

Table 6. Challenges in practicing infant-feeding option.

Challenge	Total	Percentage (%)
Stigmatisation	113	46.9
None	91	37.8
Time constraint	4	1.7
Lack of help at home	3	1.2
Finances	3	1.2
Total	241	100

before delivery and the actual practices after delivery. This was not statistically significant.

Even where support for breast milk substitutes is available, socio-demographic factors may influence feeding choices and practices. It is expected that some maternal and infant characteristics would influence the infant-feeding pattern, but a surprising finding from this study was that they had no significant effect on the infant-feeding choices and practices among this group of women. In contrast, the study involving pregnant women in Tanzania, showed that those that would be able to practice replacement feeding were women who were older, had more education, were married, had permanently employed husbands, lived in a modern house and had a high perceived nutrition security (de Paoli et al., 2004).

Could the association between the socio-demographic characteristics and infant-feeding patterns have been neutralised by the effect of infant feeding counselling? It is possible that the quality of counselling in our programme was responsible for this. This explanation is supported by another finding from the study which showed that a major factor which influenced majority of the women in their choice of infant-feeding option was the desire to reduce the risk of transmission of HIV to their babies. Understandably, the innate maternal instinct to protect the young may be the driving force for a lot of mothers. Focal Group Discussion (FGD) participants in the Tanzanian study also felt strongly that, if HIV-infected, they would give priority to not infecting their unborn child. In a South African study that studied the appropriateness of choice and practice of infant feeding, most of the HIV-positive women (73%) chose, exclusive breastfeeding, even when free formula milk was introduced in the area. From this finding, it was suggested that qualitative considerations (such as family acceptability, the practicalities of preparing replacement feeds or the fear of inadvertent disclosure of HIV status by avoiding breastfeeding altogether) were probably more important (Bland, Rollins, Coovadia, Coutsoudis, & Newell, 2007). In order to objectively determine whether there has been biased counselling which would obviously sway the infant-feeding choice of mothers; the quality of infant-feeding counselling should be assessed periodically as a form of quality control. An assessment of PMTCT programmes across four of the worst affected sub-Saharan countries had been similarly carried out utilising a structured observation checklist drawn up based upon the national training materials for counselling on infant feeding for HIV-positive mothers. More than 50% of the health workers were rated as poor in the quality of their counselling. Furthermore, it was also reported that there was a belief that an HIV-positive mother who breastfeeds her child would always infect the child (Chopra & Rollins, 2008).

The rate of mixed feeding (combining breastfeeding with other fluids and solids) from the present study was 3.7% which was relatively low in comparison with some other reported studies. A study of infant-feeding practices in India showed that among HIV-positive mothers, 62% reported some mixed feeding during the postpartum period (Shankar et al., 2005). A study in Uganda indicated that while all HIV-positive mothers started out exclusively breastfeeding, they had switched to mixed feeding by the time their baby was three months old (Bakaki, 2002). Mixed feeding has been proven conclusively to be associated with increased risk of MTCT of HIV as the probability of HIV infection in the group of mixed-fed babies had been found to be significantly higher than in those who had exclusive breastfeeding or formula feeding (Coutsoudis et al., 2001; Iliff et al., 2005).

While we acknowledge that the low rate of mixed feeding in this study has to be interpreted with caution (since it is difficult to prove that a woman had adhered to her chosen infant-feeding option), a possible explanation could lie in the fact that majority of the women in the programme (78%) notified their partners and received support from them. There are obvious advantages in involving the partner as their support may help to ensure adherence to the infant-feeding choice and other PMTCT interventions. A study from South Africa looked at how the WHO guidelines were being applied in operational settings at health facilities in South Africa and what the outcomes were on infant HIV-free survival. The study found that infant HIV-free survival could be improved if women choosing to formula feed had disclosed their HIV status (Doherty et al., 2007). Disclosure to partners should be encouraged in order to ensure adherence to the chosen option to further minimise the practice of mixed feeding. Increased partner notification has also been shown to be important for support on other PMTCT programmes (Shutes et al., 2002).

In counselling of HIV-positive women, it is important to identify barriers that could mitigate the application of infant-feeding recommendations. When an HIV-positive woman receives adequate counselling on infant feeding and she has made a choice, when she goes back home, the way she eventually feeds her infant will be dependent on the influence of her partner, family and community. Therefore, it is also important to take into consideration the attitudes of other members of the community. Stigmatisation was found to be the main challenge faced by women in practicing their chosen infant-feeding options.

Potential negative reactions from the community were also identified in a previous study as barriers to replacement feeding (de Paoli et al., 2004).

There is no doubt that socio-cultural norms promote the use of mixed feeding which has been established to carry a higher risk for MTCT of HIV. In the postpartum period, even among women who have chosen to breastfeed, they face enormous pressure from family members and partners to introduce other fluids and foods from an early age. For those that have opted for replacement feeding, in a breastfeeding community like ours, failure of a mother to breastfeed leads to suspicion and consequently stigmatisation. Stigmatisation was the greatest challenge faced by the mothers in this study and may predispose them to practicing mixed feeding. Chopra and Rollins in their assessment of infant feeding policy and programmes in four African countries observed that avoidance of breastfeeding was associated with positive HIV status of the mother. The resulting stigmatisation and other negative repercussions of non-breastfeeding made it almost impossible for many women to practice exclusive replacement feeding of young infants (Chopra & Rollins, 2008).

The traditional naming ceremony of a new baby, which is usually carried out on the eighth day of life is a cultural norm in the south-western part of Nigeria and usually attracts a lot of pump and pageantry. The mother expectedly would be exposed to a lot of scrutiny by relations, friends and other well-wishers in attendance. Therefore, since breastfeeding is the norm, the new nursing mother is viewed with a lot of suspicion when she does not breastfeed. It is not surprising that this is when the greatest pressure to breastfeed occurs.

When counselling an HIV-positive mother on infant feeding, care must be taken to guide her on how to respond when enquiries are made as to why she does not breastfeed in order not to give room to more suspicion. Interpretation of results here is difficult because of the small number studied. However, answers that may call attention to HIV infection should be avoided as awareness about the disease has increased in the general population. More research is needed in this area in order to determine how best HIV-positive mothers could handle or overcome criticisms and stigmatisation by others.

One of the limitations in this study was that the infant-feeding information was self-reported and mothers received free infant formula which could create an external validity issue. Infant-feeding practices need to be studied where formula is not provided for free. Also, the relationship between the actual infant-feeding method reported and HIV status of the infants was difficult to analyse as a result of small numbers and some infants had none or inconclusive results.

Conclusion

Despite the premium placed on breastfeeding in this locality, with infant-feeding counselling, most HIV-positive women chose and practiced formula feeding. For those that indeed desire to practice formula feeding, it is necessary to address affordable, safe and acceptable interventions to reduce MTCT of HIV and to also determine how best HIV-positive mothers could handle or overcome criticisms and stigmatisation by others.

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