Feeding of infants of HIV positive mothers

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Mother-to-child HIV transmission (MTCT) is a rapidly and newly developing field of medicine and health care. The current policy below will need to be reviewed on a regular basis and updated and adjusted as new developments emerge.

Breastfeeding is a significant and preventable mode of HIV transmission to infants and there is an urgent need to educate, counsel and support women and families so that they can make decisions about how best to feed infants in the context of HIV.1

South Africa is also a country with a wide variation of economic resources spanning very poorly resourced deep rural areas to very sophisticated and highly developed city areas. A policy of this nature cannot attempt to meet any specific area alone and is designed to provide the current state of understanding of the issue and to make the most appropriate general recommendations. Health care workers will have to assess the situation in their specific area of work and to do that which is most appropriate for the situation.

The policy does not address the provision of breast milk substitutes (such as infant formula) by the health care services nor does it address the cost of provision of formula. These issues will need to be taken up by the provincial authorities and by any other relevant authority. However, it should be noted that the cost of providing breast milk substitutes must also be compared or offset by the savings in preventing new-born babies getting HIV infection and their subsequent need for HIV/AIDS care.

This guideline is intended for the feeding of well infants whose mothers are known to be HIV positive, and is not designed for ill infants or for infants who have known HIV infection or AIDS.

Finally, South Africa has a national infant feeding policy and a Code of Marketing of Breast Milk Substitutes and these must complement any special provisions for feeding infants of HIV positive mothers.
BACKGROUND

HIV PREVALENCE IN SOUTH AFRICA IN THE SEXUALLY ACTIVE AGE GROUPS

The HIV/AIDS epidemic in South Africa has grown to very serious proportions. Over 3-million South Africans are infected with HIV and the vast majority of these infections are in the reproductive age group and in newborn infants and children under the age of one year. The 1997 HIV prevalence in women attending public health antenatal clinics has now exceeded 17% with a range of approximately 6-27% in the various provinces. The 20-24 year age group has an average HIV positive prevalence of approximately 20%.^2

MOTHER TO CHILD HIV TRANSMISSION (MTCT)

Mother-to-child transmission (MTCT) is a well-established mode of HIV transmission. It is well documented that infection may occur during pregnancy, during labour and from breastfeeding. Approximately 25%-30% of HIV infected mothers in South Africa will transmit the HIV infection to their child, and this figure may rise to 40% in developing countries.\(^{3,4,5}\) However 60-75% of infants will not contract HIV from their mothers.

MTCT during pregnancy and childbirth

MTCT is also known to be more likely if the mother has symptoms of the AIDS stage of HIV disease, immune deficiency (low CD4 cell counts) and high viral virulence (high HIV viral load) and maternal vitamin A deficiency.\(^6\) Sexually transmitted disease in pregnancy may also facilitate MTCT. It is also evident acute maternal HIV infection during pregnancy also increases the risk of MTCT.\(^7\) HIV MTCT may also be influenced by the duration of labour, the duration of ruptured membranes, the type of delivery (vaginal, instrumental, caesarean section), the extent of foetal trauma and other obstetric practices etc.\(^8\) and studies are underway to establish the efficacy of vaginal lavage with an antiviral agent in preventing MTCT during child birth.\(^9,10\)

MTCT during breastfeeding

Breastfeeding contributes to a significant risk of MTCT HIV transmission and in studies in Africa have shown that breastfeeding increases the risk of MTCT by 12-43%.\(^11\) This means that approximately a third to a half of all MTCT could be due to breastfeeding. Prevention of breast-fed related HIV transmission could significantly reduce MTCT.

HIV infected cells are present in the breast milk of HIV positive mothers and these infected cells are found in the breast milk throughout the breastfeeding period. MTCT from breastfeeding can occur anytime during the feeding and the longer the breastfeeding period the more chance there is of MTCT.\(^12\)

MTCT from breastfeeding is also influenced by the stage of the HIV condition in the mother and is more likely during the acute HIV infection, if there is symptoms of AIDS, or immune deficiency (signs of opportunistic diseases or a low CD4 cell count), high viral load and vitamin A deficiency in the mother and child and during the breastfeeding period. It may also be influenced by breast pathology such as mastitis or if the infant has oral or gastrointestinal disease such as thrush.\(^13,14,15\)

MTCT of HIV is more likely the longer the period of the breastfeeding.\(^15\) Withholding of colostrum will not reduce the threat of MTCT significantly. A new acute HIV infection during the breastfeeding period is considered to be a very powerful risk for MTCT highlighting the need for the mother to avoid any new HIV infections during the breastfeeding period.\(^17\)
Pasteurisation and/or heating are methods of sterilising breast milk and breastmilk banks (from breast milk of HIV negative women) and the use of ‘wet nursing mothers’ may also be considered to reduce the risk to the infant, however the latter may not be a practical option for wide scale public health use in situations where HIV prevalence is high.

Quantifying the risk of HIV MTCT from breastfeeding

The following calculation provides some basic assumptions and a quantification of the risk of HIV MTCT from breastfeeding in South Africa, and this may be used (with caution) for comparison with other potential risks.

The quantification of HIV MTCT example below is calculated per 100 live births:

- Assume 80% of pregnant women breast feed = 80 breastfeeding women
- Assume that 25% of all pregnant women are HIV positive = 20 women who breastfeed are also HIV positive (25% of 80)
- Assume 30% MTCT transmission perinatally = 6 infants would be HIV infected perinatally (30% of 20)
- If 30-50% of MTCT is due to breastfeeding then 1.8-3 infants per 100 births would be infected from breastfeeding.

Advantages of breastfeeding

There are many well-established clinical advantages of breastfeeding to both the mother and child as well as significant psychological benefits. These will not be highlighted in this document other than to recognise the enormous value of breastfeeding, and very serious consideration should be given to this when advising any other methods of feeding.

South Africa has a national infant feeding policy.

Breastfeeding substitutes

The process of feeding a child who is not receiving any breast milk, with a diet that provides all the necessary nutrients that the child needs is termed ‘replacement feeding’, this is to be distinguished from ‘complementary feeding’ which is given in addition to breastfeeding. Replacement feeding as a substitute for breast milk is discussed below.

- From birth to six months. Milk in some form is essential and the options include:
  - Commercial infant formula which is designed to meet the nutritional needs of the infant for the first 4-6 months of life. It may be made from cows milk or from vegetable products such as soya protein. Approximately 20kg of this formula is needed for feeding infants in the first 6 months of life;
  - Home prepared formula which can be prepared from fresh cow’s, goat’s or sheep’s milk. These fluids are different from human milk and may not provide enough micronutrients especially iron, zinc and vitamins A & C and folate.
  - Powdered full-cream milk and evaporated milks. These can be modified in a similar way to fresh milk and addition of micronutrients is needed.
  (Note: Cows milk can be modified for infants by mixing 50 mls of water for each 100ml of milk and adding 10g of sugar. Micronutrient supplementation will also be needed.)

- From six months to two years. Replacement feeding for a non breast fed infant should preferably continue to include a suitable breast milk substitute and complementary foods made from appropriately prepared and nutritionally enriched family foods given three times a day. If breast milk substitutes are not available then appropriately prepared and nutritionally enriched family foods should be given five times a day. If possible other milk products such as unmodified animal milk, dried skimmed milk, yoghurt should be included as a source of protein and if possible other animal products such as eggs, meat fish should be given as a source of iron and zinc, and fruit and vegetables to provide vitamins especially A and C.
Prevention of MTCT with antiretroviral therapy (ARV), obstetric interventions and other methods (excluding the breastfeeding substitution).

Antiretroviral therapy for MCTC

In recent years ARV has been shown to be able to reduce MTCT by 50-66% if these medications are given during the pregnancy and labour and to the newborn infant. A short course regime of 300mg zidovudine orally 12 hourly, given from 36 weeks of pregnancy onwards and 300mg 3 hourly during labour can reduce MTCT by approximately 50%.23

The effect of antiretroviral therapy (ARV) on breast fed MTCT, when given during pregnancy, is not yet established. Possible rebound HIV viraemia after cessation of ARV may increase the risk of breast fed MTCT.24

Modification of obstetrical practices

Modification of obstetric practices including restricted use of invasive procedures to reduce the exposure of the infant to the blood of the infected mother (instrumentation births, episiotomy etc) and to reduce if possible the time period of ruptured membranes.

Detection and treatment of sexually transmitted diseases and preventing new HIV infection during pregnancy

Detection and treatment of sexually transmitted diseases during pregnancy and preventing new HIV infections in the mother during pregnancy and breastfeeding will also reduce the likelihood of MTCT.

Risk of infant formula feeding for infants in South Africa

South Africa still has a relatively high infant mortality rate (IMR) when compared to developed countries.25 The IMR is a measure of the number of deaths in children under the age of 1 year per 1 000 live births. Although there are few reliable studies of actual IMR in different areas, there is a wide variation in IMR in the different areas (among children attending public health services in South Africa). The variation in IMR is in the region of 24-10326 probably averaging 41/1 000. In some very poor and low resourced areas the rate may approach 100 deaths/1 000 live births (10% of children born dying in the first year of life). In South Africa the major contributing factors to IMR, especially in lower socio-economic areas are diarrhoeal disease and respiratory tract infection and malnutrition.27 There is already an unacceptably high level (+/- 25%) of children vulnerable to malnutrition in South Africa. The incidence of malnutrition and diarrhoeal disease is directly related to access to safe clean water and sanitation and adequate nutrition. In these situations infant formula, especially via feeding bottles is dangerous and breastfeeding is indeed a lifesaver and is critical for the well being of many infants in South Africa. In these situations breastfeeding is a major factor in enabling many infants to survive the first year of life, after which the IMR declines dramatically. In low resourced areas, infant formula feeding is strongly discouraged and breastfeeding vigorously promoted.

There are also well documented additional risks (such as upper respiratory tract infections, allergy, gastrointestinal disorders) etc of formula feeding compared to breastfeeding in higher income families.

Some of the constraints associated with infant formula feeding include: access to milk formula (cost), clean safe water for mixing (water supply), facilities for cleaning and sterilising of bottles and teats (water quality and fuel), proper mixing of formula (especially avoiding overdilution), adequate
information on the correct and proper method of mixing and feeding (education level) and access to infant growth monitoring and good health care provision. Many of these constraints are structurally determined and overcoming them is often beyond the means of the mother.

In areas where there is sufficient economic development and resources, good quality and quantity water and sanitation etc, infants can be safely fed on formula alone if necessary.

**Assessing the safety of formula feeding**

In most situations, formula feeding should be advised if the risk of HIV transmission from breastfeeding appears or seems greater than the risk of formula feeding. Assessing the risk of formula feeding is often an individual assessment of the economic and social status of the individual mother and her general life circumstances. In favourable circumstances, formula feeding should be considered, especially if there is a risk from breastfeeding (HIV is one of the few significant risks). However, health care workers who are working in low resourced areas and who experience high incidences of morbidity and mortality from malnutrition and diarrhoeal disease, need to be extremely cautious in advising formula feeding and unless there is near certainty that there are adequate conditions for formula feeding, breastfeeding must be advised. Any doubt should favour breastfeeding.

Rural areas tend to be more dangerous for formula feeding than urban areas, however, every case must be assessed on its own merits.

The following conditions must exist for safe and adequate breast milk substitute feeding with formula feeding:

- Adequate and continued supply of formula milk powder. Adequate formula feeding will cost approximately R100/month for formula alone (excluding other costs such as fuel for sterilisation, bottles etc).

- Approximately 20kg of formula is required for adequate feeding in the first 6 months of life.

- The mother or other family member can access the formula supply (cost, transport, time to get the formula from the supplier).

- Adequate supply of good quality water

- Adequate sanitation in the surrounding community

- Facilities to sterilise the bottles/teats/cups/utensils

- Adequate supply of fuel for sterilisation (boiling water) or other sterilisation solutions

- Adequate understanding of the method and process of formula mixing and feeding by bottle or cup, and to demonstrate this understanding and skill by the mother.

- Reasonable access to infant growth monitoring (clinics)

- Reasonable access to health care services

**Voluntary HIV testing and counselling (VCT)**

New developments in HIV/AIDS and increased knowledge about various aspects of transmission and prevention have increased the options available to patients and mothers with HIV/AIDS. For women contemplating pregnancy or who are pregnant these new developments may influence their decision to become pregnant, to continue with her pregnancy, to consider various options for preventing mother-to-child transmission (as outlined above) etc. In many situations it is now very important and advantageous for the expectant mother to know her HIV status. There are many important issues surrounding HIV testing and how individuals cope with a HIV positive test result. Issues of stigma and discrimination are also major problems experienced by people with HIV/AIDS. It may also be a disadvantage for only the woman to be tested in the absence of her partner being tested as this may result in undue blame and other negative consequences. Ideally, the woman and her partner should be tested at the same time which promotes joint responsibility and decision-making regarding sexual practices, reproduction, maternal care and infant care.
Mandatory testing of women in pregnancy is a violation of rights and is not acceptable. Counselling should only be done on a voluntary basis, with informed consent and carried out in privacy and the results must be dealt with in a confidential manner. If testing is carried out then women need to be informed of the benefits of HIV testing and how the test may influence various therapeutic and other options.

Since the primary purpose of counselling and testing is to encourage informed decision-making and behaviour, it is very important that individuals have access to the necessary services they need. These may include family planning (to avoid pregnancy), condoms to practice safer sex during pregnancy and breastfeeding, primary care services for HIV care for adults and children and ongoing counselling services for individuals needing further support.

It is recognised that many services operate in an imperfect world where there are major deficiencies in the services. The provision of HIV testing must always be very carefully considered especially where services are rudimentary and unable to provide acceptable basic support for HIV positive mothers and their partners. In this latter situation HIV testing may cause more problems than it solves.

OTHER ISSUES TO CONSIDER

The mother’s right to choose the preferred method of feeding

Counselling and information is needed by the mother in order to make an informed and correct choice for infant feeding methods.

The mother and her partner (when appropriate) should be provided with sufficient clear information and counselling on the risks of MTCT and on the risks of alternative methods of feeding in order that she can make an informed choice. However, it is also recognised that many obstetric services are burdened by high patient loads and shortage of staff and full one-on-one counselling will not always be possible. In order to provide such services, it would require the employment of health care workers specifically for the purpose of counselling mothers and their partners (and other family members if necessary).

In very low socio-economic circumstances a mother’s economic situation may change rapidly and the counselling should try and assess the likelihood of resources being sustained long enough to ensure adequate infant feeding.

Ongoing support for mothers and infants

Health care workers will need to provide ongoing support for mothers whatever their choice of feeding. Health care workers must guard against negative attitudes towards mothers who choose an alternative feeding method than that advised by the health care worker. Accessible child care services, and especially infant growth monitoring is also required.

Involvement of the mother’s partner

Where possible and when appropriate the partner of the mother should also be counselled and assisted in understanding the situation so that he/she will provide support for the mother. A negative attitude of the partner to the feeding method can contribute significantly to an unfavourable outcome.

Condom usage during breastfeeding

Acute HIV infection during breastfeeding is a high risk factor for MCT and mothers and their partners should be encouraged to use condoms during the breastfeeding period.
Potential to antagonise promotion of breastfeeding

The promotion of formula feeding for infants of HIV positive mothers may lead to an increase in the commercial promotion of formula feeding and antagonise the codes to promote breastfeeding in general. Health care workers and the infant formula commercial industry will need to be careful not to unduly promote formula feeding to those who do not require it or to those for whom this form of feeding is inappropriate.

BALANCING THE RISKS

In an ideal world where voluntary testing and counselling and adequate information and education on HIV is provided, where safe and adequate formula feeding is possible and where ongoing support for the mother and monitoring of the infant is available, then formula feeding is the principle recommended method of feeding.

In assisting a mother in making an informed decision as to how best she should feed her infant, the risks of feeding the infant with breast milk substitutes (mainly formula feeding) must be balanced and weighed against the risks of HIV transmission via breast milk.

In making recommendations it is important to avoid being very dogmatic with any particular risk factor but to assess it carefully and explore the extent and severity of the specific factor if appropriate. Some risk factors below may be of more or less severity and importance and health care workers will need to use their discretion and judgement in assessing the individual situation.

Consider the MTCT risk factors associated with breastfeeding

The following may increase the risk of MTCT in a HIV positive mother who chooses to breastfeed:

- The longer the duration of the breastfeeding the higher the risk.\textsuperscript{30}
- If the mother has signs of immune deficiency related disorders such as: oral thrush, shingles, molluscum contagiosum, herpes infections,
dermatological problems (seborrheic dermatitis, folliculitis, Kaposi sarcoma, shingles etc), recurrent diarrhoea, respiratory infection, weight loss, TB or a history of any other AIDS defining illness the higher the risk.

- A low CD4 count (less than 200 cells/ml) if available.
- A high viral load (> 25,000 particles/ml) if available.
- Malnutrition (especially the likelihood of vitamin A deficiency) in the mother.
- Oral or gastrointestinal disease in the infant eg. oral thrush, upper respiratory tract infection, gum disease.
- Breast pathology eg. mastitis, cracked nipples.
- A new HIV infection during the breastfeeding period.

**Consider the risk factors associated with formula feeding**

The following factors may increase the risk of morbidity and mortality (diarrhoeal disease, malnutrition etc) in infants who are formula fed:

- Poor existing or very unstable maternal socio-economic situation.
- Uncertain or irregular supply of formula milk powder to the mother.
- Poor access or continued access to formula ie. cost, transport, time to get the formula from the supplier.
- Inadequate supply of good quality water.
- Inadequate sanitation in the surrounding community.
- Lack of facilities to sterilise the bottles/teats/cups/utensils.
- Poor supply of cooking fuel for sterilisation (boiling water) or other sterilisation solutions.
- Inadequate understanding of the method and process of formula mixing and feeding and inability to demonstrate adequate skill in preparing proper feeds.
- Poor access or irregular utilisation of child health/infant growth monitoring clinics.
- Poor access to health care services in general.

- Low birth weight/pre-term baby.
- Very low education level or very young maternal age (teenage).
- Maternal feelings of stigma if she formula feeds.

**Advise the HIV positive mother to choose breast milk substitutes (formula feeding), if:**

- Adequate and sustained safe formula feeding can be guaranteed and the socio-economic circumstances of the mother are satisfactory to support formula feeding. Significant risk factors outlined on page 17 should not exist if formula feeding is recommended. This implies ongoing adequate formula is available and one or more of the risk factors described on page 17 above exist.
- A mother with seriously advanced AIDS or who has signs of AIDS and is in obvious poor health.
- If there is no family history of sibling morbidity or mortality from a poverty related illness.
- Mother has serious breast pathology such as severe mastitis or infant has severe oral pathology (thrush, infections) which do respond to treatment.
- There are no significant feelings of stigma on the part of the mother.
- There are primary care services to monitor the infant's growth and provide continued support and encouragement to the mother.

**Advise the HIV positive mother to choose breastfeeding, if:**

- There is a significant likelihood that the mother cannot provide or be provided with adequate and ongoing amounts of formula; or if the water and sanitation or sterilisation issues described on page 17 are inadequate to support safe feeding. Formula feeding is considered to be risky and the mother is in reasonable health and does not have signs of AIDS (or a very low CD4 count or a high viral load) or obvious malnutrition.
 squared list
- There is a history of other sibling deaths or malnutrition or diseases relating to poverty.
- Reduce the duration of breastfeeding, if possible.
- If any other significant risk factors outlined on page 17 exist.

Respect and support for the feeding choice of the mother

Mothers must choose for themselves which feeding method they prefer and this should be done on the basis of adequate and correct information. Mothers should not be coerced or forced to accept any specific feeding method.

The mother's right to choose must be respected and ongoing support must be provided to the mother whatever method she chooses, especially when this is in contradiction to the advice given by the health care worker.

FULL FORMULA FEEDING

Formula feeding should only be advised after very careful assessment of the issues described above. The following is advised if formula feeding is chosen by the mother:

- If conditions for safe and adequate formula feeding are possible and highly probable, then the following is recommended:
  - Six months of full formula feeding and then commence weaning with complementary feeds and breast milk substitutes.
  - Cup feeding is preferred especially if bottles and teats cannot be properly cleaned and sterilised.
  - Note: if antiretroviral therapy is given in pregnancy for the prevention of MTCT then formula feeding is strongly advised.

Breastfeeding

If safe and adequate formula feeding is not possible or is an unsuitable option advise:

- Breastfeeding for 3 months and commence soft foods and complete weaning by 6 months and continue feeds with breast milk substitutes and complementary feed and enriched family foods.
Making breastfeeding safer

If breastfeeding is chosen, the feeding can be made safer by expressing the milk and boiling it briefly and allowing it to cool before feeding with a cup. Ideally this should be done as often as possible but it may be too impractical for most mothers.

HIV negative ‘wet nurses’ i.e. the infant is breast fed by other women (family members or others who are lactating and willing to feed the infant). The wet nursing option may run the risk of transmission from ‘wet nurse’ to child if she is HIV infected or from child to wet nurse if the child is HIV infected. These issues will need to be discussed with the ‘wet nurse’.

GENERAL PROMOTION OF BREASTFEEDING

It is recognised that, where appropriate, formula feeding will be advised to many HIV positive women. For HIV negative women, and many HIV positive women, breastfeeding will still be the method of choice.

In general, breastfeeding must be vigorously promoted and must remain the dominant method of infant feeding in South Africa. Health care workers, and others involved in maternal and child care must continue to adhere to the international codes of practice with regard to formula feeding and the promotion of formula feeding.

The need to advise formula feeding to HIV positive women in appropriate situations must not be confused with or deter from the general promotion of breastfeeding in South Africa.
The risk of HIV MTCT from breastfeeding is posing serious challenges to the feeding of infants of HIV positive mothers. The risk of HIV infection from breastfeeding is significant, but so is the risk of formula feeding, especially in situations of poverty and inadequate supply of food, water and sanitation. The mothers' choice of feeding is mainly influenced by advice from her doctor/midwife/counsellor. The advise given will need to take various factors into account and each mother will need to be assessed individually and advised accordingly.

The document above provides the key issues and information in determining what is the most rational and suitable advice and recommendation.

The health care services will also need to assess their priorities, budgets and resources in order to determine how much formula can be made freely available, or at a subsidised price.

The availability of formula to the mother is one of the most important considerations in determining what advice to offer. How, and if, the formula is able to be used safely and correctly is another issue, as well as some of the psycho social issues which may accompany formula feeding in mothers who are HIV positive.

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