Niger J Paed 2014; 41 (1):64 - 69

ORIGINAL

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Infant feeding practices in the first six months of life among HIV positive mothers attending Teaching Hospitals in Lagos, Nigeria

DOI:http://dx.doi.org/10.4314/njp.v41i1,12

Accepted: 2013

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Abstract *Background:* In the absence of any interventions, 5-20% of infants born to HIV-infected women will be infected through breastfeeding.
Objectives: This study determined the pattern of infant feeding in the first six months among HIV positive women attending Teaching Hospitals in Lagos.
Methods: It was a cross sectional descriptive study. All mothers who were registered between July and September 2012 in the 'Prevention of mother to child transmission' (PMTCT) clinic were interviewed (n=200).
Pre-tested interviewer administered structured questionnaire was used to collect data and analysis was done using Epi-info software. Chi-square and Fischer exact tests were used to determine associations and p-value was set at 0.05.
Results: Many of the respondents, 46.5% (n=93) were within the age range of 30 – 34. Exclusive formula feeding (EFF) was practiced by majority 73.5% (n=147) of the respondents, 18.5% (n=37) practiced Exclusive Breastfeeding (EBF) while 8% (n=16) practiced mixed feeding. Poor knowledge of infant feeding options and feeling that EBF was not enough in the first six months of life were associated with EFF ($p = 0.04$) and mixed feeding ($p = 0.01$) respectively.
Conclusion: Although majority of the respondents practiced exclusive formula feeding, a sizeable proportion still practiced mixed feeding. Strengthening of counseling sessions at PMTCT clinic, encouragement of exclusive breastfeeding with antiretroviral drugs would help reduce the prevalence of mixed feeding and hence the risk of mother to child transmission of HIV.

Key Words: Infant feeding practices, Mothers, HIV Positive

Introduction

Human immunodeficiency virus (HIV) causes acquired immunodeficiency syndrome (AIDS) a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive. [1] Major routes of transmission are unsafe sex, contaminated needles and transmission from an infected mother to her baby during pregnancy, at birth and through breast milk.

Sub-Saharan Africa remains the worst-affected region, with 22.5 million people currently living with HIV (67% of the global total) and 4.4 million children infected. In Sub-Saharan Africa, HIV has resulted in the death of 3.2 million children and 90% of the world's 16.6 million children orphaned by HIV. Among newborn infants testing HIV-positive within 48 hours after birth, approximately 50% die within six months, primarily due to infectious diseases such as pneumonia (75%) and diarrhea (40%), diseases which occur more frequently and with more severe consequences when infants are not exclusively breastfed. [3] The HIV epidemic threatens the child survival and development gains of the past decades.

In the absence of any interventions, 5-20% of infants born to HIV-infected women will be infected through breastfeeding.[4] World Health Organization estimates that 150,000 babies around the world are infected with HIV via breast milk each year. Research has shown that infants exclusively breastfed for 3 months or more had no excess risk of HIV infection over 6 months than those never breastfed and Exclusive breastfeeding (EBF) carries a lower risk of HIV infection than mixed feeding. The highest rate of infection was found among babies given a mixed diet.[5] Replacement feeding/infant formula with the avoidance of breast feeding is the only 100 percent effective way to prevent mother-to-child transmission (MTCT) of HIV after birth. Unfortunately, this might not be totally possible in some societies

especially low socioeconomic areas because of cost, the risk of infant morbidity and mortality from other illnesses and stigma.[6]

In developed countries, Mother to Child Transmission rates have fallen to as low as 2% due to the introduction of routine HIV testing among antenatal mothers and the provision of antiretroviral drugs (ARV) during pregnancy and breastfeeding, elective caesarian delivery and safe infant feeding; [7] as against 25% without such optimal treatment.[8]
In sub-Saharan Africa however, these interventions are not available to the majority. In Nigeria, EBF is promoted but adequate counseling is given to the mother and choice of infant feeding option suitable for her is made.
This study assessed the patterns of infant feeding among HIV positive mothers attending teaching hospitals in Lagos, Nigeria.

Materials and methods

The study was conducted in two (2) Teaching Hospitals in Lagos. It was a descriptive cross sectional study among HIV positive mothers with babies between 2weeks and 18months of age attending HIV/AIDS treatment centers (PMTCT clinic) in the Teaching Hospitals. All babies that were registered in the exposed babies' clinic in the two Teaching Hospitals between July and September 2012 (200) were interviewed.

Pretested interviewer administered questionnaires were used to collect data between July and September 2012 with the assistance of three medical students (500 level) and three research assistants (undergraduates) who were trained for the purpose. The questionnaire was divided into four sections. Section A collected socio demographic data. Section B collected data regarding knowledge of infant feeding options, section C collected data on attitude towards infant feeding options and section D collected data on infant feeding practices.

Ethical approval was obtained from the Health Research and Ethics committee of LUTH and LASUTH. A written informed consent was obtained from the mothers and privacy and confidentiality were assured.
Data were analyzed using Epi-info soft ware. Chi square was used to determine associations and p value < 0.05 was considered statistically significant. Fischer's exact values were calculated where chi square was not valid.

Results

The respondents were aged between 20-42 years; the mean age being 31.2 (3.8) years. Majority of the respondents (95.5%, n=191) were married. The ages of the babies ranged from 2 weeks to 18 months and a mean age of 5.04±4.33SD months. Only 34.5 %, (n=69) reported that they were counseled on both EFF and EBF and asked to make a choice, while 43.5%, (n=87) were counseled on EFF and 17.5%, (n=35) on EBF.

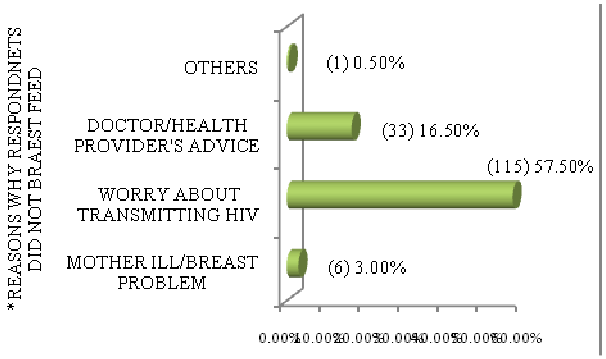
Majority of the respondents, 73.50% (n=147) practiced EFF, while 18.5% (n=37) practiced EBF and 8% (n=16) practiced mixed feeding in the first 6months of infant's life. Majority 62.5% (n=10) of those who practiced mixed feeding attributed it to breast-milk not being enough while only 18.75% (n=3) of them said it's due to ignorance about their HIV status. (Table 1)

Table 1: Infant feeding pattern among respondents within the first six (6) months of life

Feeding pattern and reasons for mixed feeding	Freq	Percent (%)
Feeding Pattern in the first 6months (n=200)		
Exclusive Formula feeding	147	73.5
Exclusive Breast feeding	37	18.5
Breast feeding, formula feeding and water	7	3.5
Breast feeding and water	6	3
Others e.g. pap	3	1.5
Reason for mixed feeding (n=16)		
Breast milk not enough	10	62.5
Pressure from family/friends	3	18.75
Ignorance pertaining to HIV status/ feeding options	3	18.75

Most of the respondents who did not breastfeed (57.50%) chose not to do so because they were worried about transmitting the virus to their babies while only 16.5 % (n=33) followed their doctors' advice not to breastfeed. Fig 1

Fig 1: Respondents reasons for not breast feeding



*multiple responses allowed

Expensive cost of purchasing formula milk was a problem faced by many of the respondents (42.50%, n=85), while 11.5% (n=23) faced complaints from relatives. Among those that practiced EBF, 18.9% (n=7) felt the breast-milk was not enough for the child while 13.5 (n=5) had pressures from relatives to give other feeds (Table 2).

The choice of infant feeding option was determined personally by majority of the respondents (67%) (n=135) while almost one quarter (21%, n=42) just followed the doctor or nurse's counsel. Among the respondents practicing formula feeding, most of them (89.8%.n=132)

prepared the formula using bottled or boiled water but most of them (80.95%, n=119) used feeding bottle to feed. Only 7.5% (n=11) of the mothers used cup and spoon to feed their babies.

Table 2: Challenges encountered with infant feeding options

Challenges with EFF (n=147)	Freq	Percent
Expensive cost of purchasing formula	85	42.5
No challenge	34	17
Pressure from relatives/friends	23	11.5
Problem with working and feeding	4	2
No regular supply of formula milk	1	0.5
Challenges with EBF (n=37)		
No challenge	14	37.84
Crack/ sore nipples/ill mother	9	24.32
Feeling that breast milk is not enough	7	18.92
Pressure from relatives to add other feeds	5	13.51
Others eg problem with working and feeding	2	5.41

Most of the mothers, 54% (n=108) started ARV's before and continued till after pregnancy, 33.5% (n=67) started during and continued till after delivery, while 5% never took ARV's. Majority 84.5% of the babies (n=169) started receiving ARV's immediately after delivery and continued for at least eight weeks but 8% were never given ARV. (Table 3)

Table 3: Distribution of respondents according to practices related to infant feeding

Person responsible for decision making on infant feeding	Freq	Percent
Self	135	67.5
Doctor/nurse	42	21
Spouse	18	9
Others	3	1.5
Family member	2	1
Method of formula feeding (n=147)		
Feeding bottle	119	80.95
Feeding bottle, cup and spoon	17	11.56
Cup and spoon	11	7.48
Water used for formula preparation		
Boiled tap water/bore hole/pure sachet	69	46.94
Bottled water	59	40.14
Pure/sachet water/bore hole	15	10.2
Boiled well water	4	2.72
Antiretroviral drugs taken by mother (n=200)		
Have been on ARV's before and after pregnancy	108	54
Started during pregnancy and continued	67	33.5
Never did	10	5
Started after delivery	10	5
Only once before delivery	5	2.5
Antiretroviral drugs taken by child (n=200)		
Immediately after delivery and continued for at least 8 weeks	169	84.5
Never did	16	8
Started days after delivery	8	4
Only once after delivery	5	2.5
Continued throughout breast feeding	2	1

A higher proportion of those who had poor knowledge of infant feeding options (77.7%, n=73) practiced EFF. There was a significant association between knowledge of infant feeding options and the feeding option adopted (p=0.04). However, there was no significant association between knowledge about HIV transmission through breastfeeding and the feeding option practiced (p=0.05). There was a significant relationship between attitude to EBF and the feeding practice adopted (p=0.01). Most of the respondents who did not agree with EBF being enough in the first six months of life (74.5%) practiced EFF (Table 4).

Table 4: Association between certain variables and infant feeding practices

Variable	EBF(n=37) Freq (%)	Mixed feeding (n=147) Freq(%)	EFF (n=16) Freq (%)	X2	p value
Knowledge about infant feeding					
Good	26(24.5)	6(5.7)	74(69.8)		
Poor	11(11.7)	10(10.6)	73 (77.7)	6.39	0.04
Knowledge about HIV transmission through breastfeeding					
Yes	26(15.5)	14(8.3)	128(76.2)		
No	11(34.4)	2(6.3)	19(59.4)	Fischer's p 0.05	
Attitude to EBF being enough in the first 6 months					
Yes	33(21.57)	8(5.23)	112(73.2)		
No	4(8.51)	8(17.02)	35(74.47)	Fischer's p 0.01	

Discussion

Almost all the respondents (95.5%) received a form of counseling on infant feeding options though almost half were counseled towards EFF. This is similar to a study in Ghana which showed that 83% of the HIV positive mothers interviewed had received counseling on World Health Organization (WHO)'s recommended feeding options during their antenatal or post natal services.[9] In another study in South Africa, 94.4% received counseling on infant feeding options.[10] This is a good steep in the right direction for Africans since counseling has been shown to aid good infant feeding practice among mothers who are HIV positive.

The high rate of EFF (73.5%) was in agreement with results obtained in Ibadan, Nigeria where choice of infant feeding was 93.5% for EFF.[11] It has been shown that HIV positive mothers are willing to choose EFF [12] and have the tendency to stop breastfeeding once they knew their HIV status.[13]

This preference for EFF could be responsible for the rate of EBF (18.5%) which was much lower than the rates obtained in some other African countries such as Kenya (35%)[14], South Africa (35.6%) [10] , Northwest Ethiopia (83.7%) [15], Ghana (100%).[9] Higher level of awareness about the current recommendation of WHO for feeding HIV positive infants in the other countries may be responsible for higher prevalence of EBF but since the prevalence of EBF amongst the general population in Nigeria is 13%, one may not expect a higher rate among HIV positive mothers.[16]

The proportion of mothers who practiced mixed feeding; an undesirable practice within the first six months of age (8%), was in keeping with results of studies conducted in Ethiopia (10.5%)[15] and South Africa South Africa (12.4%). Majority of those who practiced it did so because they believed that breast milk was not enough; though some yielded to pressure from family and friends

while others were not aware of their HIV status and the feeding options for exposed babies on time. The result is in agreement with another study where babies becoming increasingly hungry (25%) was the major reason for mixed feeding.[13] Many mothers and caregivers tend to believe that breast milk is not enough for children's growth and tend to add other items. A certain study in Lagos, showed that as many as 33.6% of those who did not practice EBF failed to do so because they added infant formula. [17] Mixed breast feeding has been shown to damage the intestinal lining of the gut in infants,[18] leading to an increased risk of HIV transmission through breast milk. [19, 20]

Apart from mixed feeding, another strong determinant for HIV transmission through breast milk is duration of breastfeeding. [21] Early, abrupt cessation of breastfeeding by HIV-infected women in a low-resource setting does not improve the rate of HIV-free survival among children born to HIV-infected mothers and is harmful to HIV-infected infants. [22] The World Health Organization recommends that when ARVs are not available, mothers should be counseled to breastfeed exclusively for the first six months of life and continue breastfeeding thereafter unless environmental and social circumstances are safe for and supportive of replacement feeding. [23]

Most of the mothers who did not breast feed chose not to do so because they were worried about transmitting the virus to their babies. This is similar to other studies in Ibadan [11] and India [24] where majority of the mothers chose not to breast feed in order to prevent transmission of HIV. Unfortunately many of those who chose EFF in this study and another study in Ghana [9] had challenges with high cost of purchasing formula milk. This could have led to over-dilution of the milk which would compromise the nutritional status of the child and lead to morbidity and mortality. Women may inadvertently endanger their infants' health by practicing formula feeding in an attempt to prevent HIV transmission through breast milk.

Among the respondents practicing formula feeding, majority used bottled water or boiled their tap/borehole/ well/sachets water to prepare the infant formula. This is in consonance with the report of another study in Benin, Nigeria where most of the mothers boiled their water before using it to prepare formula milk.[13] This shows that most of the women have been counseled on the importance of clean/treated water in the preparation of infant formula to prevention infection and they complied with the counsel. However, most of the mothers in this study used feeding bottle while only 7.5% used cup and spoon to feed their babies. This is much lower than the result from the Benin study which showed that 27.1% of the babies were fed with cup and spoon.[13] The feeding bottle may not be properly sterilized and leads to other infections which may increase the risk of morbidity and mortality in the children. This means that replacement feeding is not *safe among these participants.*

In consonance with other studies,[15, 25] most of the respondents initiated ARV drugs before delivery. Moreover, most of their babies took ARVs immediately after delivery and continued for at least 8 weeks after. This means that EBF with use antiretroviral drugs is a sustainable method among most of the HIV positive mothers attending teaching hospitals.

Poor knowledge of infant feeding options and negative attitude to adequacy of EBF in the first 6 months were significantly positively associated with EFF respectively. This means that if the women are adequately counseled and have better level of knowledge of safe infant feeding options and positive attitude, they are likely to choose to breastfeed.

The study findings are limited in terms of overall generalization since many of the infants were below six months and the mothers could have changed the feeding pattern before six (6) months of age. Moreover, since the study was health institution based, some respondents who received counseling on recommended way of infant feeding practice might have responded correctly as expected and thereby reduced the estimate of the proportion that practiced mixed feeding.

Conclusion

Most participants practiced Exclusive Formula Feeding or Exclusive breastfeeding but mixed feeding was still recorded. Cost of purchasing formula milk and bottle feeding were major challenges to safety of formula feeding whereas more of the respondents who practiced EBF experienced no challenge. Replacement feeding is therefore not affordable and safe among the respondents. EFF was associated with poor knowledge of infant feeding options and attitude to adequacy of EBF. Information concerning post-natal HIV transmission and counseling about safe infant feeding options offered to HIV positive women should be adequate and clear. Further studies would be required to determine and compare the morbidity and mortality rates among babies who are exclusively breastfed and formula fed.

Authors' contributions

Ginigeme ON and Olatona FA: Participated in the conceptualization, design, analysis and interpretation of data.

Olatona FA: Drafted the manuscript for important intellectual content and reviewed it.

Roberts AA and Amu EO: Participated in drafting and critical review of the manuscript. All authors read and approved the final manuscript.

Conflict of interest: None

Funding: None

Acknowledgements

The authors acknowledge the staffs of APIN clinic LUTH and LASUTH for their great assistance during data collection.

Certification

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Dr Foluke Adenike Olatona

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