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Assessment of Infant Feeding Practice Among HIV Positive Mothers and HIV Status of Their Infants in Adama Hospital, Oromia Regional State, Ethiopia, 2016

Yalemwork Getnet Mengistu* and Misker Kedir

Department of Reproductive Health and Health Service Management, Addis Ababa University, Ethiopia

Abstract

Background: Vertical transmission is Human immunodeficiency virus transmission from a human immunodeficiency virus-positive mother to her child during pregnancy, labour, delivery or breastfeeding. In the absence of an intervention during these times, rates of Human immunodeficiency virus transmission from mother-to-child can be between 15-45%.

Objective: To assess the infant Feeding Practice of human immunodeficiency virus positive mothers and examine Human immunodeficiency virus status of their infants.

Methods: A cross sectional study was done in Adama Hospital in Antiretroviral therapy clinic and prevention of Mother to child transmission of Human immune deficiency virus clinic from January 1-30, 2016 by simple random sampling technique through face-to- face interview using interviewer administered structured questionnaire. A total of 327 women who are living with Human immunodeficiency virus having infants less than 12 months who were visiting health institution during data collection time was recruited and assessed for infant feeding practice and Human immunodeficiency virus status of their infant. The collected data was entered into a computer and cleaned analyzed using statistical package for the social science Version 16.

Results: Of the 327 subjects, the proportion of mothers who experienced Exclusive replacement feeding, Exclusive breast feeding and mixed feeding were 46.8%, 30.6%, 15.3%, respectively. A range of social and obstetrics factors such as mode of delivery were noted to have significant Relation with Exclusive replacement feeding practice. There was statistically significant association between mode of delivery and Exclusive breast-feeding practice using chi square test. Among those infants who were delivered from human immune deficiency virus infected mothers participated in this study, 6.1% of them were positive for Human immune deficiency virus.

Conclusion: Exclusive replacement feeding and Exclusive breast feeding were common infant feeding practices and no distinct difference of Human immunodeficiency virus status of infants was observed between Exclusive breast feeding and Exclusive replacement feeding.

Keywords: Infant; Feeding; HIV positive; Practice

Abbreviations: ANC: Antenatal Care; ART: Anti-Retroviral Therapy; ARV: Anti-Retroviral; BSS: Behavioral Surveillance Survey; C/S: Caesarian section; DHS: Demographic Health Survey; DNA: Deoxyribonucleic Acid; EBF: Exclusive Breast Feeding; ECSA: Ethiopian Central Statistics Agency; EDHS: Ethiopian Demographic Health Survey; ERF: Exclusive Replacement Feeding; FHAPCO: Federal HIV/AIDS Prevention and Control Office; IRB: Institutional Review Board; MCH: Maternal and Child Health; MTCT: Maternal to Child Transmission; NGO: None Governmental Organizations; PCR: Polymerase Chain Reaction; PMTCT: Prevention of Maternal to Child Transmission of HIV; RF: Replacement Feeding; STI: Sexual Transmitted Infection; SVD: Spontaneous Vaginal Delivery; UNAIDS: United Nations program on AIDS; WHO: World Health Organizations

Background

According to world health organization (WHO) there were approximately 36.9 million people worldwide living with HIV/AIDS at the end of 2014. Of these 2.6 million were children (<15 years old). Sub-Saharan Africa is the most affected region, with 25.8 (24.0-28.7) million people living with HIV in 2014. Sub- Saharan Africa accounts for almost 70% of the global total of new HIV infection which is escalated by vertical HIV transmission. Vertical transmission is HIV transmission from an HIV-positive mother to her child during pregnancy, labour, delivery or breastfeeding. In the absence of an intervention during these times, rates of HIV transmission from mother- to-child can be between 15-45%. MTCT can be nearly prevented if both the mother and the child are provided with ARV drugs throughout the stages when infection could occur [1].

According to the federal HIV/AIDS prevention and control office of Ethiopia, there were a total of 433,763 HIV positive females and 65,088 HIV positive children 0-14 years in 2016. When we see the regional figure, Oromia is the highest, having a total number of 111,053 female HIV positives and 9,540 women who are in need of PMTCT. when we see the level of knowledge about Maternal to child transmission of HIV (MTCT) based on the Ethiopian demographic health survey of 2016, it was found 51.7% and this result is the 3rd least result compared to all regions of Ethiopia [2,3].

***Corresponding author:** Yalemwork Getnet Mengistu, Department of Reproductive Health and Health Service Management, Nutrition Unit, School of Public Health, College of Health Sciences, Addis Ababa University, Ethiopia, Tel: +251911384327; E-mail: yalemworkgetnet@gmail.com

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In 2005, the Oromia Regional Health Bureau and several stakeholders collaborated to launch a PMTCT program in the region. The enrollment of HIV-positive pregnant women in the PMTCT program at different service delivery points, however, was extremely low. The opt-in strategy has been used during counseling and testing at ANC clinics. In 2008, 54% of the pregnant women attending ANC care in the Oromia region of Ethiopia declined testing for HIV, which means more missed opportunities than program reports from similar settings indicated. This shows, HIV positive pregnant mothers will not be awarded about how to feed their new born baby [4].

Infant feeding is critical in the first year of life and a key determinant of child survival and development. Breastfeeding is a universal socio-culturally acceptable, nutritious way to feed an infant and provides immunity (UNAIDS, 2009). However, the pandemic HIV/AIDS and the recognition that HIV positive mothers can transmit the virus to their babies through breast milk precipitated a terrible public health dilemma in countries like Ethiopia where incidences of HIV is high [5].

Statement of the Problem

As a result of sustained progress in scaling up services to prevent mother-to-child transmission, the world is within reach of key components of the push to eliminate new infections among children. If scale-up is continued, it is possible to provide services to 90% of pregnant women living with HIV by 2015 to prevent mother-to-child transmission of HIV. If other services to end vertical transmission and safeguard maternal health are accelerated. It will be possible to reduce the number of new HIV infections among children by 90% and keep mothers and children alive and healthy. Consequently, prolonged breastfeeding improves child survival, but accounts for 30-40% of postnatal HIV transmission. On the other hand, replacement feeding (RF) prevents all postnatal transmission, but is associated with higher infant morbidity and mortality. National or sub-national decision making on how to counsel and support mother's feeding options must take into account the risk of postnatal of HIV, child mortality and under-nutrition in the HIV-exposed infants, among others [6,7].

Globally, about 300,000 babies become infected with HIV through breast milk each year; while at the same time 1.5 million children die each year if the women opt not to breastfeed [8]. For instance, in resource poor settings where the risks of infant death due to diarrhea diseases and malnutrition outweighs the risks of HIV transmission, EBF has been recognized as the best chance of the infant to receive the nutrients and antibodies needed to survive [9,10].

The most appropriate infant feeding option for an HIV-infected mother depends onher individual circumstances, including her health status and the local situation. The health services available and the counseling and support she is likely to receive should be considered. The World Health Organization (WHO) recommends HIV-infected women breastfeed their infants exclusively for the first six months of life, unless replacement feeding is acceptable, feasible, affordable, sustainable and safe for them and their infants before that time. When those conditions are met, WHO recommends avoidance of all breastfeeding by HIV-infected woman [11].

Methods and Materials

The study was conducted in Adama general Hospital and Medical College, Oromia regional state. Adama is a city in central Ethiopia and is Zone of Oromia with a total population of 2,20,212 surrounded by "East Shewa Zone" [12]. It is 99 km southeast of Addis Ababa. The city is located between the base of an escarpment to the west and the Great Rift Valley to the east. Which have one governmental and four private hospitals: Six governmental health centers and one NGO's health center, 112 private clinics and 118 pharmacies. The zonal referral hospital consists maternal and child health care unit (MCH) provides PMTCT service to pregnant women attending antenatal care. The unit includes antenatal, labor/delivery and postnatal care, family planning and STI service, voluntary confidential counseling and testing, anti-retroviral drug therapy for prevention of MTCT and pre-and post-test counseling. The PMTCT service/program started in 2004 with the support of NGOs.

Cross sectional study design was employed from January 1-30/2016 on mothers who are HIV positive and have HIV exposed child less than 12 months and visiting ART center, PMTCT and child health of Adama hospital. Sample size was determined by using single population proportion formula by assuming prevalence of HIV among mothers giving live birth 50% with 95% CI and 5% precision (marginal error) and a non-response rate of 5% total sample size was 338. Simple random sampling technique was used to reach at a single participant. A numbered list of the entire unit population from which sample was taken and each unit on the list was numbered in sequence from 1 to N (Where N is the Size of the population) which is 2000.Then required number of sample units was selected, using a "lottery" method. Standardized interviewer administered questionnaires adapted from behavioral surveillance survey (BSS) and Demographic Health Survey (DHS were used to collect the data. The questionnaire was prepared in English then translated to local language Amharic and Aphan Oromo. The data was collected by four trained data collectors recruited from Adama town who have at least diploma in nursing and have previous experience in data collection. After checking and coding, data were entered, cleaned and analyzed using SPSS Version 16.0.

Ethical consideration

Ethical clearance was secured from Addis Ababa University IRB and permission obtained from Adama general hospital and Medical College. The study participants were interviewed after explaining about the aim of the study, confidentiality and their autonomous decision to participate in the study and verbal consent was obtained from them.

Results

Sociodemographic characteristics

A total of 327 respondents who were HIV positive mothers and having infants aged <12 months were participated in this study with mean age of 28.18 (SD ± 4.07) and 80.7% of them were married, 32.4% have completed their secondary education, 57.8% were Oromo ethnicity and 80.7% were orthodox Christianity followers.

Knowledge about MTCT and PMTCT and infant feeding option and attitude towards infant feeding

A total of 6 closed ended questions were applied to assess the knowledge of mothers about mother to child transmission of HIV/AIDS and its prevention. Accordingly, those who mentioned 2 and above transmission method and prevention method were considered as having sufficient knowledge (59.3%) and 91.1% were aware of at least one option of infant feeding of HIV positive mothers. When we see the time of HIV testing of HIV positive Mothers in Adam hospital, 85% of respondents were tested for HIV before marriage, 9.5 % during their pregnancy and 5.5% during the recent delivery.

Infant feeding practice

Out of the total participants, 46.8% practiced exclusive replacement

feeding, 30.6% exclusive breast feeding, 15.3% mixed feeding and 7.3% breast feeding followed by replacement feeding and 69% initiate breast feeding with in the 1st 1 h. The distribution of type of replacement feeding affirmed by study subjects was infant formula 42.7%, cow's milk 39.6% and both infant formula and cow milk alternatively 17.6%. More than half of the mother (63%) who practiced replacement feeding reported to prepare the feeding 4-7 times, (20.7%) less than 3 times and the rest 16.3% more than 7 times per day. Bottle as feeding utensil was commonly used 81.5% of study subjects (Table 1).

Maternal and infant health

Among all respondents 34.6% have breast and nipple related problem and 40.4% had other health problem. Above quarter of mothers (34.6%) reported to change their infant feeding method when they had breast related illness. Regarding to their infant health status, 42.2% reported that infants had at least one illness since birth. From these 39.1% had diarrhea, 34.8% had fever, 10.1% had mouth problem, 15.2% had difficulty of breathing (Table 2).

Variables	Level	N	%
Type of feeding	ERF	153	46.8
	EBF	100	30.6
	Mixed	50	15.3
	BF to RF	24	7.3
Time of first initiation of BF	Within the first 1 h	120	69
	2-8 h	40	23
	After 8 h	14	.8
Type of replacement feeding	Infant formula	97	42.7
	Cow's milk	90	39.6
	Both cow's milk and infant formula alternatively	40	17.6
Type of utensils used for feeding	Bottle	185	81.5
	Cup with spoon	42	18.5
Frequency of formula feeding	<=3 times	47	20.7
	4-7 times	143	63
	>7 times	37	16.3
Boils water to wash feeding	Yes	196	86.3
	No	31	13.6

Table 1: Infant feeding practice of HIV positive mothers, Adama General Hospital and Medical College, 2016.

Variables	Level	EBF N (%)
Age	15-24	23 (30.7)
	25-34	70 (31.4)
	35+	7 (24.1)
Educational status	Illiterate	34 (46.6)
	Can read and write	7 (54)
	1-8	42 (41.6)
	9-12	9 (8.5)
	College and above	8 (23.5)
Maternal illness	Yes	13 (25)
	No	87 (31.6)
Infant illness	Yes	43 (31.2)
	No	57 (30.2)
Knowledge of MTCT	Sufficient	62 (32.6)
	Insufficient	38 (27.7)
Knowledge of PMTCT	Sufficient	61 (31.4)
	Insufficient	39 (29.3)
Awareness of infant feeding option	Aware	90 (30.2)
	Not aware	10 (34.5)

Table 2: Exclusive breast-feeding practice by age among HIV positive mothers, Adama General Hospital and Medical College, 2016.

Mothers who had college and above educational level, had antenatal follow up were less likely to practice mixed feeding than illiterate, had no antenatal follow up, respectively (Table 3).

Demographic characteristics of infants and HIV test status

About half 48% of infants born from HIV positive mothers were female and majority of infants categorized in the age group 4-6 months. All the infants were tested for HIV and the median age of HIV test was 3 months and 6.1% of infants were HIV positive. The type of test which was done was DNA PCR, which was done by health institution for the prevention of mother to child transmission (Table 4).

Using X^2 test it was found that there is a statistically significant association between type of feeding and mode of delivery with p value 0.035.

Discussion

In developed countries, formula feeding for infants of HIV positive mothers is standard practice since the risks of HIV transmission far outweigh morbidity and mortality resulting from replacement foods. In developing countries, however, the debate continues regarding the benefits and risk of breast-feeding versus infant formula feeding.

Variables	Level	Mixed N (%)
Age	15-24	11 (16.7)
	25-34	32 (14.3)
	35+	7 (24.1)
Marital status	Single	6 (23.1)
	Married	31 (11.7)
	Divorced	13 (38.2)
	Widowed	0
Educational status	Illiterate	18 (24.6)
	Can read and write	3 (23.1)
	1-8	15 (14.9)
	9-12	11 (10.4)
	College and above	3 (8.8)
ANC follow up	Yes	44 (14.3)
	No	6 (31.6)
Knowledge of MTCT	Sufficient	21 (11.1)
	Insufficient	29 (21.2)
Knowledge of PMTCT	Sufficient	25 (12.9)
	Insufficient	25 (18.8)
Infant feeding option awareness	Aware	44 (14.8)
	Not aware	6 (20.7)
Maternal illness	Yes	17 (32.7)
	No	33 (12)
Infant illness	Yes	29 (21)
	No	21 (11.1)

Table 3: Mixed feeding practice by age among HIV positive mothers, Adama General Hospital and Medical College, 2016.

Variables	Level	N	%
Infant age group	<1 month	32	9.8
	2-3 months	60	18.3
	4-6 months	120	36.7
	7-9 months	63	19.3
	10-12 months	52	15.9
Infant sex	Male	170	52
	Female	157	48
Age during HIV test	<3 months	227	69.4
	4-6 months	54	16.5
	7-9 months	42	12.8
	10-12 months	4	1.2
HIV status of the infant	Positive	20	6.1
	Negative	307	93.9

Table 4: Demographic characteristics and HIV test status of infants born from HIV positive mothers, Adama General Hospital and Medical College, 2016.

In this study, nearly half of the respondents were noted to practicing ERF (46.8%) and slightly greater than a quarter of mothers living with HIV practiced EBF (30.6%), This finding concurs with the earlier studies done in Botswana, Zambia, South Africa and Uganda which showed that most HIV positive mothers decided to replacement feed and (30-40%) practiced exclusive breast feeding but it was contrary to finding in Mekelle Town, Tigray Region, North Ethiopia exclusively breastfed; 6.3% were mixed fed and 3.4% were exclusively replacement fed [13-16].

According to the WHO guidelines, the inclusion of any feeding in addition to breast-milk into the diet (with the exclusion of medicines) constitutes mixed feeding. The proportion of mixed feeding in this study was 15.3%, this proportion is much higher than the Cameroon report (4.3%) and lower than the study from India (29%) and also higher than Mekelle Town, Tigray Region, North Ethiopia (6.3%).

In this study, Subjects who delivered by C/S were more likely to practice replacement feeding than delivered by SVD. Subjects delivered with cesarean section were less likely to use breast feeding than spontaneous vaginal delivery. The finding is in concordance with the study conducted in Uganda and Cameron [14,15].

It is recommended that early cessation of breast feeding is important to minimize HIV transmission. In this study, more than half of participants stopped breast feeding within 4-6 months child age and 72% of them started complementary feeding at 6 months of child age.

Mother to child transmission is the major source of HIV infection in children. In general, without specific intervention, MTCT rate ranges from 25-35% in the case of exclusive breast feeding until 6 months. In this study, 6.1% of them tested positive. The type of test was DNA PCR. The prevalence may be under estimated since the finding did not include infants who have not been tested for HIV, still births and infant deaths and those who did not utilize health services. Besides, the low prevalence may be due to widening of PMTCT services, ARV prophylaxis and ART accessibility for eligible mothers and different prevention methods.

HIV transmits from mother to child through breast-feeding and the transmission is high among infants feeding breast milk than replacement feeding. However, study findings regarding to HIV transmission risks between exclusive breast-feeding and exclusive replacement feeding was not conclusive. For example, study conducted in Nairobi, Kenya showed high HIV transmission on breast feeding arm than replacement feeding [17].

On the other hand, study done in Durban, South Africa, revealed, after adjustment for potential confounders, exclusive breast-feeding at 3 months was an equivalent risk to no breast feeding. In this study, HIV positive result of infants was significantly associated with mixed feeding. Mothers who practiced mixed feeding had higher rate of HIV positive infants than who practiced EBF and ERF. However, there was no significant difference in HIV status of infants between infants who had history of exclusive breast feeding at most 6 months and exclusive replacement feeding. This may be due to small number of HIV positive samples and methodological differences even though the finding is similar from South Africa findings. The median age of infants during HIV test in this study was 3 months [18-20].

In this study, it was found that more than half of the study subjects had sufficient knowledge of PMTCT and MTCT (59.3% and 58.1%, respectively). Study done in Hong Kong, China and Ethiopia, Harar documented similar findings (50-60%). However, study conducted in Ghana and base line study of Ethiopia revealed lower proportion of mothers to have sufficient knowledge of MTCT (25%). The difference of the result may be due to, PMTCT services are recently integrated to ANC service and the service is being strengthened from time to time [21-24]. A large proportion of study subjects (91.1%) were aware of infant feeding option of HIV positive mothers which is in concordance with the study conducted in Addis Ababa, Gurage zone, which confirmed most respondents around 80% were aware of the recommended feeding option of infants below six months old born from HIV positive women [20,23].

Conclusion

The find of this study concluded that majority of study subjects practiced exclusive replacement feeding and High proportion of mixed feeding was observed. Exclusive breast-feeding practice and exclusive replacement feeding practice was significantly associated with mode of delivery. Subjects who delivered by C/S were more likely to practice exclusive breast feeding and less likely to practice breast feeding as option was given in some of health institution to choose C/S and ERF and SVD and EBF.

Even if there were small number of HIV positive infants, HIV positive results of infants were significantly associated with mixed feeding. There was high risk of HIV transmission in mixed feeding and there was no significant difference between EBF and ERF. Based on this we recommend that, Education and communication on MTCT, PMTCT and infant feeding option of HIV positive mothers should be strengthened at all levels and follow up training should be given for counselor working in PMTCT sites and health workers in service delivery area about the infant feeding option by the ministry of health and its partners and alleviating the problem of social stigma that helps mother to choose safer infant feeding option through various available media, Posters and counseling tools on infant feeding option for PMTCT sites such as table's flip charts should be made available in PMTCT sites and should be used regularly in health care facilities, Demonstration session should be arranged on how to prepare and feed infant formula or home prepared milk mothers who choose replacement feeding by health care givers.

Authors Note

KM collected the data. MYG and KM designed the study, analyzed the data and wrote the manuscript. All authors read and approved the article.

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