Socio demographic characteristics, antenatal clinic attendance and PMTCT knowledge of postnatal HIV+ women at an urban public health facility in Nairobi, Kenya

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Abstract

Background: Women who have inadequate or poor knowledge about Prevention of Mother to Child Transmission (PMTCT) of Human Immunodeficiency Virus (HIV) are more likely to default on antiretroviral treatment and less likely to implement MTCT preventive measures thus a sub-optimal viral suppression and an increase in MTCT rates. Early and frequent Antenatal Clinic (ANC) attendance integrated with PMTCT services increases MTCT knowledge and uptake of the services thus optimising intervention outcomes.

Objectives: To determine the socio-demographic characteristic levels that influence Antenatal Clinic (ANC) attendance, PMTCT knowledge and Antiretroviral (ARV) drugs uptake among postnatal HIV+ women.

Setting: Pumwani Maternity Hospital in Nairobi, Kenya.

Methodology: This was a cross-sectional descriptive study that was conducted at Pumwani Maternity Hospital which is in a low social income set up in Nairobi County. The hospital has active ANC and Postnatal Clinic (PNC) facilities that provide PMTCT and specialist referral obstetric services to more than 30,000 maternity clients annually. HIV+ positive postnatal women who were seeking health services at the hospital were identified using their health records and recruited into the study either while still in the postnatal ward after delivery or during post natal clinic visits within the period of the study. Standardized structured questionnaire was administered to collect the appropriate study data from the mothers.

Results: A total of 326 HIV+ women, aged 15 - 42 years (mean 28.3 years) participated in the study. Most of the women were either married (72.9%), single (15.7%), widowed (6.8%) or separated (4.6%) and of low levels of education. Majority were either housewives (38.3%) or engaged in small businesses such as selling vegetables and merchandising food items and second hand clothes. Their overall estimated monthly mean domestic expenditure was about US$ 102. Most of the women (92.4%) attended antenatal clinic in peripheral health facilities and only came to PMH for delivery services. Majority (94.5%) of the women received Counselling and Testing (CT) while a few (3.3%) reported being counselled but not tested at the antenatal clinic. Among the women who were counselled but not tested for HIV antenatally majority (81.8%) declined to be tested due to fear of being told that they were HIV+. They learnt about their status later after delivery when they were convinced to undertake the test. Regarding knowledge about MTCT 94.7% of the women agreed that they were aware that HIV can be transmitted from the mother to her child by various methods. Some of the women (14.1%) were not aware that abstaining from breastfeeding can prevent MTCT and almost half of them (45.7%) did not know that exclusive breast feeding was also another preventive measure. Almost 15% of the mothers were not aware that they could prevent MTCT by using ARV's. Some of the women (15%) had not informed their husbands regarding their HIV status. However we did not establish any significant relationship between the husband's knowledge of the wife's HIV status and the women's acceptance to use ARV's. There was also no significant relationship between the husband's consent and women's decision to use ARV's whereas most of the women (99.3%) confirmed that they would take the ARV's regardless of whether their husband agreed to the usage or not. The ARV adherence was not influenced by

the number of ANC visits, parity, education status and husband's lack of awareness about the wives' HIV status.

Data on ANC attendance indicated that majority (91.1%) of the women attended ANC at least one or more times either in the peripheral facilities or at Pumwani Hospital but most (66%) made the first visit in the 5th to 7th month (average 6th month) of gestation. High ANC attendance rate was significantly associated with the uptake of prophylactic ARV's (P=0.001). The frequency of ANC attendance was also significantly associated with the health facility where the mother attended the clinic (P=0.0045). Almost half (46.6%) of the women made only 1 to 3 ANC visits. Reasons for not attending ANC included not wishing to attend (66.6%), not knowing the importance of ANC (16.7%) and far distance to the clinics (16.7%).

Conclusion: The main gaps that were observed in this study are the late initiation and low frequency of ANC attendance, low PMTCT knowledge and delayed first visit and uptake of ARV's among HIV+ women in this low socioeconomic set up. This calls for improvement of health services and community oriented PMTCT education in the peripheral health facilities where the bulk of ANC activities took place.

Key words: HIV, ANC, PMTCT and ARV's

Introduction

The Kenya National AIDS Control Programme (NASCOP) estimates that 37,000 to 42,000 infants are infected with HIV annually following MTCT of the virus [1]. During pregnancy MTCT is estimated to occur at the rate of 5 to 8% across the placenta, 10 to 20% during labour and delivery and 10 to 15% via breastfeeding [1, 2]. Mother to child transmission is the main mode of HIV transmission to more than 90% of children below 5 years who are currently estimated to number more than 180,000 in Kenya [1, 3]. A pooled analysis of data from several studies has demonstrated that without treatment the net survival of these HIV infected children at one year is 52% among infants who get infected perinatally and 78% when the infection occurs during breastfeeding. Unfortunately more than 50% of these children die by the second birthday if no intervention measures are taken [1, 4]. Reduction of MTCT has the potential of decreasing the numbers of HIV infected children, increasing child health and survival, decreasing the load on the health system and providing opportunity to improve and expand health services and strengthening the existing health structure [1].

The World Health Organisation (WHO) PMTCT strategic vision 2010-2015 identifies Antiretroviral Therapy (ART) as the core intervention measure for prevention of mother to child transmission [5]. This is in harmony with the findings from Randomised Clinical Trial (RCT) reports that MTCT rates are drastically reduced when ART is effectively applied in varying socioeconomic setups [6-10]. Data from RCT's in sub-Saharan Africa shows that when Combination Antiretroviral Therapy (cART) is initiated early in pregnancy in combination with infant post exposure prophylaxis it achieves peripartum HIV transmission rates similar to those in resource high social economic settings [6, 11]. Infant prophylaxis has also been shown to be as effective as maternal treatment with ARV's reducing transmission rates at 6 weeks to as low as 1.2% [6]. The use of Single dose Nevirapine (SdNVP) or in combination with Zidovudine (AZT) has been the mainstay of prophylactic ARV's therapy in PMTCT where cART is not indicated, available or practical to administer [8, 9].

Additional behavioural surveillance studies in the Kenyan population indicate that 70% of women of birth giving ages are aware about MTCT of HIV/AIDS although less than one-third of them are aware that medications can be used for PMTCT [12]. Similarly, women having inadequate or poor knowledge about ART and PMTCT and of low socioeconomic background [13, 14] have been reported to be more likely to default on the treatment. Successful HIV therapy requires adherence of more than 95% by the patient after which treatment failure rates increase sharply as the adherence decreases [13]. This can lead to sub-optimal viral suppression, development of viral resistance, a higher risk of MTCT and MTCT of a resistant HIV-1 strain [15]. Risk of acquiring HIV infection has also been reported to be higher in women from low income bracket as in a cohort study in Ethiopia in which the infection rate among women earning less than US$25 per month was almost three times higher than in women earning more than US$ 200 [16,17].

Kenya has adapted the WHO 2010 Guidelines Option A regimen for prophylaxis, and a Multi- Sector National AIDS Strategic Plan (2009/2010 – 2012/2013) is in place, of which PMTCT is a major component (5). The Ministry of Health (MOH) through NASCOP has developed PMTCT guidelines that direct the implementation of PMTCT services which include CT with administration of Highly Active Antiretroviral therapy (HAART) and prophylactic ARV regimens to HIV+ women and their children [1]. NASCOP aims at eliminating MTCT (eMTCT) by reducing transmission rates to less than 5% among breastfeeding populations or 90% reduction in MTCT by 2015 in line with the United Nations AIDS (UNAIDS) declaration of 2009 [1].

Pumwani Maternity Hospital handles over 30,000 maternity cases annually that are mainly from a low social income setup. The hospital provides ANC and PNC services that are integrated with PMTCT activities. There being no published data on the socio-demographic characteristics, ANC attendance and PMTCT knowledge

of PMH clients and given the hospital's leading role in provision of maternity services to the general public in Nairobi made it an ideal place for this kind of study.

Materials and Methods

Study area: Pumwani Maternity Hospital's post natal ward and PNC formed the main areas where this research was conducted. The target population was HIV+ postnatal women that were seeking health services at the hospital that were identified using their health records and recruited into the study either while still in the postnatal ward after delivery or during PNC visits within the period of study.

Sampling procedure and data collection: The characteristic of interest (HIV seropositivity) was rare in the study's postnatal population hence the participants were recruited by the convenient sampling method. They were counselled, informed the purpose of the study and guaranteed of confidentiality following which their signed consent of participation was obtained. The data was collected in pretested standardized structured questionnaire seeking information on demographic, education, expenditure, religion, occupation and attendance of ANC, knowledge on PMTCT and uptake of ARV's. The participants were given the option to answer all, some or none of the questions.

Data analysis: Data was cleaned, coded and entered into the computer and analyzed in SPSS version 13 using descriptive statistics. Chi square was used to test the statistical relationships between various parameters where significance was achieved at *p values* less than 0.05.

Ethical consideration: Approval of the study was obtained from the necessary national and the local authorities namely Ministry of Science and Technology, Pumwani Maternity Hospital and Kenyatta University. Informed consent was obtained from all the participants and their details treated confidentially.

Results

Demographic characteristics: Data for 326 HIV+ postnatal women aged 15 – 42, mean age 28.3 years was collected (Figure 1). Most of the women (72.9%) were married, of low levels of formal education (Figure 2), 38.3% were housewives while others were engaged in small business like selling second-hand clothes, vegetables or merchandising food items (Table 1). The participants' overall monthly mean domestic expenditure was about US$102. Almost all belonged to some form of organized religious groups (90.5% Christians, 9.2% Muslims).

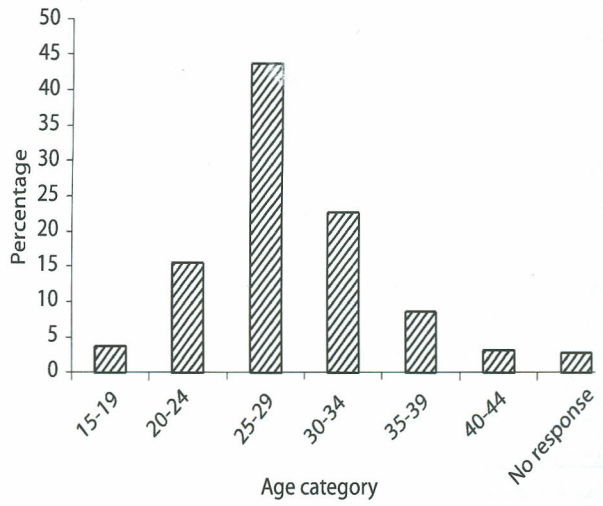

Figure 1: Age profile of HIV+ postnatal women at PMH

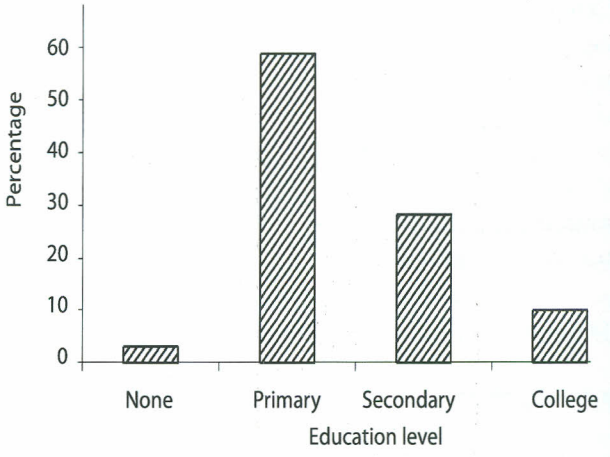

Figure 2: Education levels of HIV+ postnatal women at Pumwani Maternity Hospital

Table 1: Occupations of postnatal HIV+ women at PMH

Occupation	No. of women	(%)
None	28	8.6
Housewife	125	38.3
Small business	102	31.3
Employed	68	20.9
No response	3	0.9

Table 2: Frequency of ANC visits based on the health facility attended

Health facility visited	Number of ANC visits (n=297) 1 - 3	4 - 6	7 - 10	Total
Pumwani Maternity	9 (34.6%)	13 (50%)	4 (15.4%)	26 (8.7%)
Peripheral health facilities	133 (49.1%)	133 (49.1%)	5 (1.8%)	271 (91.2%)
Total	142 (47.8%)	146 (49.1%)	9 (3.1%)	297 (100%)

$\chi^2 = 15.39$, df = 2, p-value = 0.00045

ANC attendance: In the data on antenatal clinic attendance majority of the mothers (97.5%) attended ANC one or more times (Table 2) either at the peripheral facilities (91.2%) or at Pumwani Hospital (8.7%). About half of the mothers (49.1%) made 4 to 6 ANC visits followed by 47.8% who made 1 to 3 visits and only 3.0% made more than 6 visits. Most of the women made their first ANC visit in their 5th to 7th month (average 6th month) of gestation (Table 3).

Table 3: Gestation period when participants started attending ANC

Gestation age (months)	No. of women	(%)	Valid %
2 - 4	23	7.1	7.8
5 - 7	194	59.5	66.0
8 - 10	77	23.6	26.2
No response	32	9.8	-

Among the women who did not attend ANC most of them (66.6%) did not like it while the rest either did not know the importance of attending ANC (16.7%) or the clinics were long distances away (16.6%). Most of the women (94.5%) received CT for HIV but a small number (3.3%) reported being counselled but declined to be tested for HIV, majority of whom (81.9%) feared being told that they were HIV+. They learnt about their status later after delivery when they were convinced to undertake the test. Majority (92.4%) of women attended ANC at peripheral health facilities and only came to PMH for delivery services. The women's choice to deliver at the hospital was based on affordability (62.7%), referral from other health facilities (32.8%) and proximity of the hospital to their homes.

PMTCT knowledge: Regarding knowledge about MTCT 94.7% of the women agreed that they were aware that HIV can be transmitted from the mother to her child by various methods (Figure 3). Some of the women (14.1%) were not aware that abstaining from breastfeeding can prevent MTCT and almost half of them (45.7%) did not know that exclusive breast feeding was also another preventive measure.

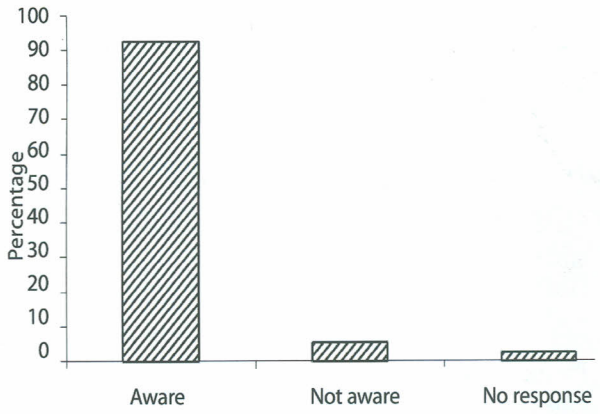

Figure 3: Awareness on MTCT among HIV+ postnatal women at PMH

Almost 15% of the mothers were not aware that they could prevent MTCT by using ARV's. Among those who did not take ARV's 15% had not informed their husbands regarding their HIV status resulting in none uptake of ARV. However, 99.3% of the women in the study confirmed that they would take the ARV's irrespective of the husband's consenting to it. Overall uptake of ARV was 88.9% (Table 4) among those who attended ANC. More than half of these mothers (54.1%) received single drug regimen, either SdNVP or AZT alone whereas the rest (45.8%) received AZT Combined with NVP.

Table 4: Effect of ANC attendance on uptake of prophylactic ARV's

Type of ARV	Number of ANC visits (n=290)			
	1 - 3	4- 6	7- 10	Total
Sd NVP or	86	70	1	157
AZT alone	54.80%	44.60%	0.60%	54.10%
NVP combined	48	78	7	133
With AZT	36.10%	58.60%	5.50%	45.80%
Total	134	148	8	290
	46.2%	51.0%	2.7%	88.9%

$\chi^2 = 13.8$, df = 2, p value = 0.001

When different variables were compared (Table 5) uptake of ARV treatments was significantly associated with increased ANC attendance (p=0.001).The health facility where ANC was attended also significantly influenced the frequency of attendance (p=0.00045). There was no significant relationship between ARV adherence and the husband's consent to the wife to receive ARV, husband's lack of awareness about the wives' HIV status, parity and education status.

Table 5: The relationship between various socio-demographic characteristics and the study variables

Comparative parameters		χ^2 value	df	P value	Outcome
No. of ANC visits	ARV uptake	13.8	2	0.001	Significant
No. of ANC visits	Health facility attended	15.39	2	0.0045	Significant
Husband's aware of status of wife'(HIV)	ARV adherence	1.77	1	0.183	Not significant
Husband's consent	Use of ARV's	0.865	1	0.352	Not significant
Education status	ARV adherence	9.033	2	0.01	Not significant
Parity (Pregnancy ranking)	ARV adherence	5.297	2	0.07	Not significant
No. of ANC visits	ARV adherence	0.392	2	0.621	Not significant

Discussion

The current study demonstrated that 91.1% of postnatal HIV+ women attended ANC one or more times but only 52.2% of them made 4 – 6 visits as recommended by WHO guidelines on Focussed Antenatal Care (FANC), that "expectant women should make at least four ANC visits in order to ensure adequate PMTCT knowledge, improved ARV uptake, increased rates of survival of HIV+ mother and child and reduced MTCT of HIV" [18]. However overall 51.8% of the participants in this study either did not attend ANC or fell below the minimum recommendation of 4 ANC visits during pregnancy. Increased ANC attendance corresponded with high overall knowledge on PMTCT (92.3%) which was significantly associated with ARV uptake (P=001).

The level of PMTCT knowledge was higher than the 70% that was previously reported in the general population of Kenyan female adults who claimed to know about MTCT [10]. However, based on specific questions asked, 15% of the HIV+ women did not know the role of ARVs in the prevention of mother to child infection. This could affect the realization of the targets set out by WHO; "to reduce under-five deaths due to HIV by at least 50% and to provide antiretroviral therapy for all children with HIV by the year 2015" [18]. Our study identified such gaps on knowledge which could be narrowed through heightened public awareness campaigns tailored for the affected groups in the community. Successful outcomes of such campaigns conducted in South Africa, Kenya, Uganda and Nigeria have been reported [19,20].

Data on ANC attendance and knowledge on PMTCT or the information on the time of discovery of the HIV status was not assessed based on age groups, but majority of the HIV+ mothers were aged between 25 to 29 years, which makes this a high risk group. Therefore, it is important to strengthen PMTCT information dissemination in young mothers. Survival rate in such HIV+ mothers would be of interest to follow based on age and the time of contracting the infection. Mortality rate could be higher in those with longer exposure to the infection than the newly infected mothers, especially the newly married young women [18].

Kenya statistics on mortality rate in HIV+ mothers was 360/10000 in 2010 [19] and similarly as high in Nigeria around the same period [10,20]. Early visit to ANC within the first 2 - 4 months of pregnancy could expose women to an early assessment of HIV and general health status which could lead to early introduction of ARV prophylaxes and increased survival rates of mother and child. Only 7.8% of women in our study started ANC visits within the first 1 - 4 months of pregnancy as compared to 15% who made their first visit within the same period of pregnancy in a national survey in Kenya 2008 – 2009 where 37% of expectant women made their first visit within 4 - 5 months and 37% in month 6 and 7 of pregnancy [19]. Same survey reported infant mortality rate of 55/1000 for infants and 80/1000 for under-fives. The ANC attendance patterns seen in this current study group are not different to those reported in other parts of sub-Sahara Africa even though there seem to be varying trends from one area to another [21]. Half of the women in Ghana started attending ANC within the first trimester and around 10% within the third trimester as compared with Kenya and Malawi where 12% and 15% of women initiated ANC attendance in the first trimester respectively and around 40% much later within the 3rd trimester [21]. This difference in ANC attendance could be explained by the perceived quality and focus of the services that are provided at the clinics. For example, in Kenya the women are mainly concerned about checking on the progress of the fetus with very vague ideas about the services being provided at ANC [21].

Most of the women in our study delayed their first ANC visits and made only a few visits implying that they faced situations that could not allow them to come to the clinics earlier or more frequently. Ministry of Health in Kenya provides free maternity services and yet some of

the women cited long distances to be prohibitive to their ANC attendance. This draws our attention to the indirect costs that are associated with ANC visits some of which have been identified and include transport costs to the hospital and costs of meals which are taken by the mother and accompanying persons or children while waiting to be served [21]. Some of the cost implications that could be associated with failure to attend ANC frequently included closing of business so that one could travel to the health facility or the housewife asking the husband to provide her with bus fare that will enable her to reach the hospital. Many Kenyan women do not attend ANC until the sixth or seventh month of pregnancy to minimize the total cost of ANC visits [21].

Breastfeeding was documented as one of the main means of MTCT [23, 24]. HIV+ mothers can prevent MTCT by abstaining from breastfeeding, exclusive breast feeding or by feeding the infants on formula feeds [22,23]. However, abstaining from breastfeeding would have its own challenges in poor resource communities where access to safe water for making the substitute milk feed may be challeging besides the financial implication of acquiring the formula milk. Exclusive breastfeeding is therefore the best option for HIV+ mothers in our study group. For exclusive breastfeeding, it is recommended to breastfeed for the first six months of life introducing appropriate complementary food thereafter and discontinue breastfeeding. Infants should be provided with once-daily nevirapine (NVP) for 6 weeks [24]. Information gap was noted in PMTCT knowledge in regards to breast feeding in which only 54.3% of the mothers reported to know about the importance of breastfeeding but no data was collected on the practices in this study. It is likely that a large number of those who did not have PMTCT knowledge on breastfeeding (45.7%) practiced mixed feeding thus endangering the survival of the infant as reported in other studies. Based on the social economic state of our study participants, exclusive breast feeding could be the only safe method since most of them could not afford substitution feeding. Studies conducted elsewhere demonstrated the effectiveness of breastfeeding in combination with ARV in the reduction of mortality and postpartum infection. Thior *et al* [23] demonstrated that, breastfeeding with zidovudine prophylaxis was not as effective as formula feeding in preventing postnatal HIV transmission, but was associated with a lower mortality rate at 7 months and further in 18 months.

Our study did not assess the number of HIV+ babies resulting from MTCT but it is forthcoming that the rate of infection is commensurate with the length of exposure to PMTCT information and the adherence to ARTs uptake [6, 24]. Other studies on antiretroviral therapy conducted elsewhere [6] reported low HIV transmission when cART is initiated early in pregnancy in combination with infant post exposure prophylaxis. Preventing mother-to-child transmission is much more effective if the mother takes ART and/or the child takes nevirapine for 6 weeks [20]. Markedly high number of women (89.9%) received prophylactic ARV's (p value = 0.001) in the current study. More than half of the mothers (54.1%) received single drug regimen, either SdNVP or AZT alone whereas the rest (45.8%) received AZT combined with NVP. Kenyan data of 2011 on ARVs prophylaxis indicated that among pregnant women with HIV who received ARVs in 2010, 33% received SdNVP, a regimen currently not recommended by WHO and only 23% received more effective regimens [19]. Preventing mother-to-child transmission is much more effective if the mother takes ART and/or the child takes nevirapine for 6 weeks [13,24]. The 2006 recommendation of single-dose nevirapine for the infant is no longer acceptable. High use of single dose nevirapine in our study may therefore affect the outcome of prophylaxis in infants which calls for proper choices for the prophylactic drugs in PMTCT in the health facilities of our study.

Most of the women in this study (72.9%) were married. Involvement of a husband in PMTCT issues could be important for the survival of the infected mother and child [20]. Our data indicated that 15% of the infected women did not inform their husbands about their HIV status, a situation that could reduce the survival rate for the mother and the child. The question of a husband can also be associated with increased parity which is generally higher in married women than in single mothers. This increases the risks of acquiring HIV in the subsequent newborns, especially if both spouses are infected. Husbands also control the finances at home in most cases. About 38% of the women were housewives who largely depended on their husbands on financial matters including availing of fare to antenatal clinics. Husbands who are uninformed about the matters of ANC attendance, risks of HIV transmission within the family and PMTCT may negatively influence the outcomes. Husbands should therefore be part of the PMTCT education programmes in order to increase ANC attendance, uptake of ART and survival rate of mother and child. Successful outcomes were reported where husbands were involved in PMTCT education programmes [24]. Such programmes were more successful if community leaders including religious leaders were directly involved in mobilization of the husbands. Our study did not assess the level of participation by husbands but this approach must be encouraged.

Significantly a large number of women [91.2%) attended ANC at peripheral health facilities but majority of pregnant mothers (92.4%) delivered at PMH (p-value = 0.00045). The choice to deliver at PMH demonstrated the disparity of services among health facilities which points at a need to upgrade most of them in order to bring the services closer to the people. Women's choices to deliver at PMH were based mainly on the cost effectiveness of the hospital services (62.7%) and the limitation of the services at the peripheral centres. The average monthly mean expenditure of the study group was about US$102. Assuming that the house where the women lived had only the mother, two children and husband it implies that each lived on less than US$30 per month which is

below the World Bank criteria for below poverty level. This was a good indicator that poverty hinders good ANC attendance hence poor PMTCT knowledge. This is further supported by a report from Ethiopia that the number of HIV infected women was three times higher in those earning less than US $25 than in those earning more than US $200 [17]. Socioeconomic background of the women would therefore emphasise the call for cost subsidised services in order to bring the services closer to the people.

Cost could also have influenced the 7.4% of the women who did not indicate the health facility where they delivered. It cannot be ruled out that this group benefited from the services of traditional birth attendants or that they delivered at home through relatives or friends. It is estimated that 60% of all the deliveries in Kenya take place at home or through traditional birth attendants, mainly because of cost element. However, such deliveries could increase the risks of MTCT of HIV in the infant besides exposing the attendants to risks of contracting the infection, especially if the skills of the attendants are wanting. This could explain the high incidence of HIV+ children and high rate of MTCT by HIV+ mothers reported in the Kenyan surveys [10,18]. Our findings therefore support a policy shift towards cost supplemented maternal-child health services that will encourage ANC attendance and hospital deliveries. There were also those who did not attend ANC at all and those who did not agree to test for HIV during ANC visits and only came to know about their status during delivery. This marked level of ignorance demands strengthened Community Health Workers' programmes for proper information dissemination [19].

Conclusion

The present data portrays major gaps related to ANC attendance, PMTCT knowledge and ART uptake in a low social economic setup in Nairobi. Such gaps could challenge the realization of WHO target to reduce MTCT of HIV, increase ART uptake and increase survival rates for HIV+ mother and the child by year 2015. Enhancement of health services, cost subsidization of specialized services and new approaches of PMTCT education dissemination are paramount for successful outcomes.

Competing interests

The authors declare that they have no competing interests.

Acknowledgments

We acknowledge the approval of this research by the Research Ethical Committee in Kenyatta University, Ministry of Science & Technology and Pumwani Maternity Ethical Committee. We thank the staff of Pumwani hospital for their assistance as well as the women who willingly participated in the study. We appreciate the support given by all whom we can't mention individually but whose assistance, through collection of data, statistical analysis, typing of the manuscripts, etc. went along way in enabling the study to be successful.

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