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SELF-REPORTED ADHERENCE TO SINGLE DOSE NEVIRAPINE IN THE PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV AT KITALE DISTRICT HOSPITAL
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S.C. BII, B. OTIENO-NYUNYA, A. SIIKA and J.K. ROTICH

ABSTRACT

Objectives: **To evaluate the uptake and adherence to single dose nevirapine among HIV positive mothers.**
Design: **Descriptive cross-sectional study.**
Setting: **The maternal and child health and family planning (MCH-FP) clinics in Kitale district hospital, Western Kenya.**
Subjects: **HIV positive postnatal women attending MCH-FP clinic who had gone through the PMTCT programme.**
Results: **A total of 146 respondents were recruited for this study. Most (90%) of them reported swallowing their nevirapine tablets, however only 55 swallowed their tablets within 4-12 hours before delivery. The most important factor affecting nevirapine adherence was place or delivery ($p<0.05$). Most (71%) of mothers who did not swallow their nevirapine delivered at home. Women attending ANC for two times or less young women under 20 years of age and single women were also less likely to swallow their nevirapine ($p < 0.05$). Most (91%) of the babies received their nevirapine syrup with 98% of them getting it within 72 hours of delivery. Eighty eight percent of babies who did not take their nevirapine were delivered at home. Babies whose mothers did not take their nevirapine were also more likely to miss it.**
Conclusions: **Self reported adherence to take home nevirapine is high. However mothers who deliver in a health facility were more likely to access nevirapine both for themselves and their babies than those delivering at home.**

INTRODUCTION

HIV prevalence in women is significantly higher than in men. The Kenya Demographic and Health Survey of 2003 found a prevalence of 8.7% in women as compared to 4.6% in men (2). Young women are particularly at risk of HIV. High rates of maternal infection coupled with high birth rates and lack of access to PMTCT services as well as prolonged breastfeeding translates into a high burden of HIV in children.

Infants who acquire HIV infection from their mothers do so during pregnancy, during labour and delivery and after birth through breastfeeding. The recommended approach to the prevention of mother to child transmission of HIV include prevention of primary infection in both women and men, prevention of unintended pregnancies in HIV infected women, prevention of mother to child transmission of HIV among mothers who are already infected and provision of care and support for HIV infected women, their infants and their families (1).

In 2004, over 265,000 pregnant women were accessing basic PMTCT services in Kenya (8). This represented 22% of all pregnant women in the country. Acceptance of HIV testing at sites varies from 25% to 95% with an average of 65%. However, only about 40% of HIV-positive pregnant women who had been counselled and tested were able to access nevirapine (8).

The PMTCT programme in Kitale District Hospital started in 2002. The HIV prevalence among antenatal clients at the hospital is 7% (5). Counselling and testing is uttered within the MCH clinic. The uptake of counselling and testing is about 60%. In 2004, there were 6155 antenatal clients in the hospital of whom 3727 (60.6%) were counselled and tested for HIV and out of whom, 280 of them were HIV positive (7.5%). Only 62.5% of women who were HIV positive were given nevirapine while 21.4% of babies born to HIV positive mothers received the nevirapine syrup.

About 88% of all pregnant women in Kenya attend ANC at least once during their pregnancy (3). Despite the high ANC attendance, most women are not likely to deliver in a health facility. Only 32.5% of rural women deliver in a health facility (3). Most of these antenatal clients therefore will deliver at home. Because most of the women are not likely to be delivered by a health professional, nevirapine is routinely given to HIV positive pregnant women who have undergone counselling and testing for PMTCT to go home with nevirapine is usually given at first contact. Usually as early as 28 weeks gestation because some mothers may attend the antenatal clinic only once or twice.

There are many aspects of nevirapine adherence that affect PMTCT. The time a mother or the baby swallows nevirapine is important. Nevirapine has a long half life in circulation and can safely be taken even 12 hours before delivery (6,7). The baby is also supposed to be given the syrup nevirapine within 72 hours of delivery (7). Mothers may also be given the nevirapine syrup to go home with, with instructions on how to give to the baby. Considering this is done even as early as 28 weeks gestation, it is possible that adherence to nevirapine may be affected by misplacement of drugs, forgetfulness or even general distrust of the medicine and availability of traditional medicine and strong cultural beliefs. Poor storage of drugs may also affect their potency.

MATERIALS AND METHODS

Study area and study design: This study was carried out at the Kitale District Hospital between April and July 2005. This was a cross sectional study. A structured questionnaire was used in data collection. The information collected was based on self-reporting by the study participants.

Target population and inclusion criteria: All HIV positive postnatal mothers who had been enrolled in the PMTCT programme at the hospital were requested to participate in the study. A written consent was obtained from the participants. The criteria used in the recruitment of the study participants was that they were HIV positive and knew their HIV status, were post-natal between six weeks and one year of delivery, had undergone PMTCT at ANC or maternity at Kitale District Hospital and had been given single dose nevirapine (SDNVP) at ANC or maternity or delivered in hospital

Sampling and sample size: All clients who met the recruitment criteria and consented to join the study were recruited. A total of 146 mothers were recruited within the study period. The minimum sample size was statistically determined.

Data management and analysis: Data from the structured questionnaires were analysed using the Statistical Package for Social Sciences (SPSS) software. Cross tabulations were derived and chi-squares used to test significance of relationships between variables. Logistic regressions were also used to compare several variables. Statistical significance was taken as $P<0.05$. Tables were used to present the data.

RESULTS

General characteristics: A total of 146 HIV-positive postnatal women were interviewed for this study. The median age was 28 with a range of 12 to 42 years (Table I).

Table 1
Demographic information

Characteristic	Number of subjects	(%)
Marital status		
Single	27	18
Married	102	70
Widowed / divorced / separated	17	12
Level of education		
None	17	12
Primary	91	62
Secondary	32	22
Post secondary	6	4
Occupation		
None	94	64
Informal sector	42	29
Formal sector	10	7

Antenatal care and delivery services: Most of the women interviewed had attended the antenatal clinic (93%). About half of them (52%) started ANC within the 2nd trimester. The number of ANC visits ranged from one to nine. Most women attended the clinic for between two to four times. The mean attendance rate was 3.5 times. Most women stopped going for ANC the last two weeks to delivery. About half (49%) of the respondents had revealed their HIV status to their spouses while only 40% knew the HIV status of their spouses.

A total of 96 (66%) respondents delivered in a health facility. Young single women were more likely to deliver at home than their older or married counterparts ($p<0.05$). There were 20 (14%) women delivered through Caesarean section. Most of these Caesarean deliveries were emergencies.

There were 150 babies delivered by the 146 women interviewed. There were four sets of twins and seven (4%) babies were preterm. The birth weights for the babies ranged from 1.3 to 4.6 kilograms with a mean of 3.0 kg.

Nevirapine update: Most of the respondents had been given the nevirapine tablets to go home with at ANC (88%). Among the women who delivered at home, 80% (40/50) of them reported swallowing their nevirapine. Overall, 90% (132/146) of all the respondents reported swallowing their nevirapine.

For those who did not swallow, the reasons varied from misplacing the drugs to forgetting to swallow them. For those who swallowed the tablets, 73 (55%) of them took the tablets within four to twelve hours before delivery. There were seven women who took their tablets after delivery.

The age of the respondents and their marital status affected their adherence to nevirapine ($p<0.05$). Younger women under 20 years of age and those who were single were less likely to swallow their nevirapine than their older colleagues. The number of ANC attendance's also affected adherence to maternal nevirapine ($P<0.05$). Women who attended ANC for 0-2 times were less likely to swallow their nevirapine than those who went for more times.

Most mothers who did not swallow their nevirapine tablets delivered at home (Table 2). Out of the 14 mothers who did not take nevirapine, ten delivered at home (71.4%) while only four of those who did not take nevirapine delivered in hospital. Among the four women who delivered in hospital and yet did not take their nevirapine, two forgot and the nurses did not give them while the 3rd refused the nevirapine and the 4th was taken in for emergency Caesarean delivery before she had been given the nevirapine. The majority of women delivering at home however still took their nevirapine (80%) as opposed to 20% of those who did not. Among women delivering in a health facility, 96% of them took their nevirapine tablets as opposed to only 4% who did not. This was because women delivering at home were more likely to have misplaced or to forget to take the nevirapine than those delivering in hospital.

Table 2

Comparison between place of delivery and mother nevirapine uptake

Place of delivery	Swallowed nevirapine		Total
	Yes	No	
	No. (%)	No. (%)	No. (%)
Home	40 80	10 20	50 100
Hospital	92 96	4 4	96 I00
Total	132 90	14 10	146 100

P <0.05

Gestation at birth also affected mother nevirapine adherence. Ninety three percent (130/140) of those who delivered at term swallowed their nevirapine as opposed to only 33% (2/6) of those who delivered preterm ($p<0.05$).

Most mothers were not given the baby nevirapine syrup to go home with. Only 16 (11%) women had taken home the syrup. Most babies

therefore received the nevirapine from the health facility. Ninety one percent (136/150) of the babies were given the nevirapine syrup. Most of them (98.5%) received it within 72 hours of delivery. For those who received the drug majority were given within the first day. Most of the babies who did not receive nevirapine were delivered at home (Table 3). Out of the 14 babies who were not given nevirapine, 12 (86%) of them were delivered at home representing 86%. This is in contrast to only two babies who did not receive nevirapine and were delivered in hospital. The reason why the two babies did not receive the nevirapine is that they died soon after birth. The other two babies who received nevirapine after day three were also delivered at home. For those who did not receive the drug the main reason was that the health facility was too far for mothers who delivered at home.

The mode of delivery and spouse's awareness of HIV status did not affect adherence to nevirapine.

DISCUSSION

Most of the HIV transmission from mother to child occurs during the perinatal period and therefore the primary aim of giving SDNVP is to prevent this transmission. Mothers are required to take the drug at onset of labour while babies are supposed to get the drug within 72 hours of delivery. From this study, most of the clients attended the antenatal clinic where they were counselled and tested for HIV. This is also the time when most of the women are given the nevirapine tablets to go home with. In this study most of the respondents had been given the nevirapine tablets at the antenatal clinic to take home. Although the majority of the women who delivered at home reported swallowing their nevirapine, as expected women delivering in hospital were more likely to swallow their nevirapine than those who delivered at home. Women delivering at home who did not swallow their nevirapine were more likely to have misplaced their tablets or they just did not remember to swallow their tablets. This is possible considering that some or these women are

Table 3

Proportion of infants who did not receive nevirapine in relation to place of delivery

Baby given nevirapine syrup	Place of delivery		Total
	Home	Hospital	
	No. (%)	No. (%)	No. (%)
Yes	38 29	94 71	132 I00
No	12 86	2 14	14 I00
Total	50 34	96 66	146 I00

P<0.05

There was a strong association between the uptake of infant nevirapine and maternal nevirapine (p<0.05). Where a mother did not swallow her nevirapine, there was also a high likelihood that the baby did not get its nevirapine. Only 6% of babies whose mothers swallowed nevirapine did not receive the nevirapine as opposed to 43% of babies whose mothers did not swallow their nevirapine (Table 4).

Table 4

Comparison between mother's nevirapine swallowing and baby's nevirapine uptake

Mother swallowed nevirapine	Baby given nevirapine syrup		Total
	Yes	No	
	No. (%)	No. (%)	No. (%)
Yes	124 94	8 57	132 90
No	8 6	6 43	14 10
Total	132 100	14 I00	146 100

P<0.05

given their tablets as early as 32 weeks gestation. Home deliveries have also been associated with maternal non-adherence to nevirapine in studies which have been done elsewhere in the region (1).

As expected, women who attend the antenatal clinic for fewer times were also less likely to swallow their nevirapine than those who attend more times. Although the reason for this could not be ascertained in this study, ongoing counselling for those who attend more times is likely to reinforce the importance of the medicine. Women who also attend more times are more likely to be adherent to instructions than those who did not. As such, subsequent visits are necessary to reinforce some of the information. It is possible that the majority of women who do not attend antenatal clinic deliver at home and so do not benefit from PMTCT interventions.

Although partner awareness of HIV status of the spouse would be expected to increase adherence to nevirapine, this was not the case in this study. From this study, there was no relationship between partner awareness of HIV status and nevirapine adherence for both mothers and babies. These results tally with those of a study done by Albrecht *et al* (2) in Lusaka, Zambia which noted that couple antenatal HIV counselling did not improve adherence to nevirapine. However, studies which have been done in other settings have suggested that antenatal couple counselling increases adherence to nevirapine (4). In this study, it was also found that young single women were less likely to swallow their nevirapine than their older or married counterparts. This is because this group of women was less likely to attend antenatal clinic in the first place.

Women who delivered pre-term were less likely to swallow their nevirapine than those who delivered at term. This is similar to the results obtained by Albrecht *et al* (2) in Lusaka Zambia which associated maternal non-adherence to nevirapine to low new-born birth weight.

Majority of babies who received nevirapine were those who were delivered in hospital or those whose mothers managed to take them to hospital immediately after delivery for the syrup. Mothers who delivered in a health facility were more likely to access nevirapine syrup than those who delivered at home. Some mothers who delivered at home found it difficult to take their babies to hospital immediately after delivery because of distance. Others said they forgot altogether to take their babies to the hospital for the syrup. Babies whose mothers swallowed their nevirapine were also more likely to receive their navirapine.

This study has confirmed that even if these women are given the nevirapine tablets to take home, they end up swallowing them. The only problem was the timing of the nevirapine. To enhance proper adherence, clear instructions should be given in the ANC. Proper adherence counselling of mothers during the antenatal period is therefore important in order to ensure that they take their drugs correctly and for them to even understand why they are taking the drugs in the first place. Mothers should be encouraged to deliver in a health facility and those who opt to do so should be advised to report early in labour to allow for proper monitoring of labour. Unlike in maternal nevirapine adherence, most babies who were given the nevirapine generally received it within the recommended time. This is because most of these babies were delivered within the health facility. However, majority of babies who were delivered at home did not receive their syrup. Most of the women who delivered at home complained that the facility was too far so they could not take their babies for the syrup after delivery. If these women could be encouraged to deliver in a health facility, infant nevirapine uptake could improve.

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