Maternal Outcomes among HIV Positive Pregnant Mothers and Birth Outcomes of HIV Exposed Newborns in Nyahururu County Referral Hospital, Kenya

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Summary

BACKGROUND

Approximately 37 million people were living with HIV by the end of 2015. This led to high morbidity and mortality among women of childbearing age, especially in Sub-Saharan Africa which was the epicentre of this global pandemic. Strengthening and implementing prevention of mother-to-child (PMTCT) services could reduce the incidence of vertical transmission and improve quality of life. We aimed to determine maternal and birth outcomes among HIV-positive pregnant mothers and HIV-exposed newborns in Nyahururu county referral hospital, Laikipia, Kenya.

MAIN OUTCOMES MEASURES

Reduce maternal morbidity and mortality and other birth-related complications. In addition, this will also reduce infant mortality and morbidity among HIV-exposed infants.

MATERIALS AND METHODS

This was a hospital-based descriptive prospective study conducted at the PMTCT department at the Nyahururu County referral hospital. A sample of 180 HIV-positive pregnant women enrolled at the PMTCT consented to participate in the study. We monitored them until delivery and labour complications were addressed. Babies were scored against the APGAR scale, weighed and spot dried blood samples taken before breastfeeding; and started on prophylactic antiretroviral therapy.

RESULTS

Out of 180 participants, only 17 did not complete the study. Our findings indicate that 97.5 % of the mothers delivered in the hospital, had labour lasting less than 12 hours, 92.6% had a normal delivery and 94.9% had no complications during the labour period. About 2.5 % of the women had misoprostol administration. The majority of exposed babies had an average weight of between 2.51 - 3.00kg. No neonatal asphyxia was evident among exposed babies.

CONCLUSIONS

The majority of the respondents delivered in the hospital; no neonatal asphyxia was evidenced and there was a significant correlation between APGAR scores and infant weight. There is a need for active follow-up and monitoring of HIV pregnant women and their unborn babies until delivery.

***Keywords**: Maternal Outcome, Birth Outcomes, HIV Exposed Babies*

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Introduction

Approximately 37 million people were living with HIV by the end of 2015. Sub-Saharan Africa was the epicentre of this global pandemic accounting for two-thirds of all infections. This led to high morbidity and mortality among women of childbearing age. Prevention of mother-to-child transmission (PMTCT) of HIV is a programme that targets to maximize the health of HIV-positive women and decrease the risk of vertical transmission of HIV from mothers to their infants. It ensures that the mothers' viral load (VL) decreases while the CD4 count increases. Measures are also taken to ensure the maximum level of health throughout pregnancy.

Proper strengthening and implementation of PMTCT services could reduce the incidence of Mother to Child Transmission (MTCT) and improve the quality of life. In the absence of such follow-up, the ultimate health outcomes of the infant, as well as the mother, will be suboptimal. Antiretroviral therapy (ART) is a key component of the PMTCT array of interventions. Just like other HIV patients, adherence to the ART treatment is very fundamental in ensuring that positive pregnancy and birth outcomes are achieved.

Preterm births, low birth weight, and small-for-gestational-age are common birth outcomes in Sub-Saharan Africa (3, 18). Evidence from high-income nations indicates that the burden of disease and health systems is higher, although advanced health systems are significantly improved compared to the African region (4). A study conducted in Sub- Saharan Africa in 2009 revealed that HIV-positive pregnant women were at an increased risk of anaemia leading to adverse pregnancy outcomes (13) and Children born to HIV-infected mothers were at increased risk of death regardless of their HIV status (8).

In 2010, UNAIDS estimated that 20% of all children born in sub-Saharan Africa were exposed to HIV, among whom 130 000 new HIV infections occurred (14) Morbidity and mortality burden among these newly HIV-infected infants was high, with an estimated 50% mortality rate by their second year (11). Of the remaining children who were HIV-exposed but who remained uninfected (HIV-EU), several studies describe elevated mortality in comparison to HIV-unexposed infants (19, 2). The mechanism of increased risk among HIV-EU infants and children is not entirely clear, but may be linked to the effects of maternal HIV-related illness and mortality (17), (9), (10) exposure to opportunistic infections (5) and/or a mother/families' capacity to care for infants, such as the ability to breastfeed (12).

Materials and methods

This study adopted a descriptive prospective study design. The study was conducted in the PMTCT department at the Nyahururu County referral hospital. A sample of 180 HIV-positive pregnant women was followed up until delivery. The women tested HIV positive during routine antenatal visits. In addition, all the HIV-exposed infants born from positive mothers were also included in the study. The study used the mother and child health handbook (MOH 216) to collect data.

The data collected included social demographic characteristics, antenatal profiles, and laboratory investigations. In data analysis, SPPS version 25.0 was used. Frequency distributions percentage and measures of central tendency were used to describe demographic data and adherence to prophylactic ARVs. Chi-Square Tests, Cross tabulation, Model Summary, Analysis of variance and Coefficients were used to assess the association between age parity and educational parity among others.

Results

Of all 180 participants, the overall response rate was 91 % and 17 (9%) of the participant did not complete the study. Table 1 presents the demographic characteristics of the participants.

Mode of delivery

Out of 163 participants, 87.1% of the women had a spontaneous vaginal delivery. We also found that 12.9 % were delivered through the caesarean section**.**

Complications during labour

We found that 94.9% of the women had no complications during the duration of labour. The study also found that 5.1 % of the women had post-partum haemorrhage complications during the duration of labour.

Oxytocin administration

The study found that 97.9% of the women received oxytocin during the third stage of labour. The study also found that 2.5% of the women had no oxytocin administration during the third stage of labour.

Weight of newborn infants

The results showed that 8.2% of the infants weighed 3.51 kg and above. The result also showed that the majority of newborns had an average weight of between 2.51 - 3.00 kg and 3.01 - 3.50 kg categories.

Table 1:
Demographic Characteristics of HIV Pregnant Mothers

Characteristic		No. of Respondents
Age (Yrs)	11-20	11(6.7%)
	21-30	60(36.8%)
	31-40	84(51.5%)
	41-50	8(5.0%)
Marital Status	Married	109(66.9%)
	Single	45(27.6%)
	Divorced	9(5.5%)
Educational Level	None	6(3.7%)
	Primary	63(38.7%)
	Secondary	70(42.9%)
	Post-secondary	24(14.7%)
Parity	First	30(23.4%)
	Second	51(31.3%)
	Third	48(29.4%)
	More than three	20(16.0%)
Social support	Partner	100(61.3%)
	Family/relative	50(30.7%)
	Friend	1(0.6%)
	Alone	12.7.4%)

Table 2:
Duration of Labour

Characteristic	No of respondents
Less than 12 hours	156(95.7%)
More than 12 hours	7(4.3%0

Average APGAR score of the newborns

The results show that 47.8% of the newborns had an APGAR score of between 8.01 - 9.00; and 54.7% of the newborns had an APGAR score of between 9.01 - 10.00. Thus, the majority of the newborns had an APGAR score of above 8.

Dried blood sample (DBS) collection

The study also found that Dried Blood Sample (DBS) were not taken at birth for 4 (2.5%) of the newborns. We infer that the larger proportion of newborns had Dried Blood Samples (DBS) taken immediately after birth.

Antibiotic administration within 24 hours after delivery

From the results, 6 (96.3%) of the newborns were given antibiotics within 24 hours after delivery; 157 (96.3%) of the newborns were not given antibiotics.

Discussion

The overall response rate among HIV pregnant women attending PMTCT clinics in Laikipia County was significantly high. We can attribute this to the role of counselling, social support, follow-up from community health volunteers, quality and timely free services and a friendly environment in encouraging HIV-positive pregnant women to access the services.

The majority of participants were aged between 30-40 years. Perhaps this is contributed by their peak age of fertility and sexual activity hence the increased number of pregnancies. The highest percentage of our participants was married. Their partners also formed an integral part of the comprehensive care program.

The majority of the women had achieved high school education. This is a significant contributory factor in that majority of these women had enough knowledge and could make informed decisions on their health status. In addition, counselling, follow-up and proper communication channels were fully utilized hence making the follow-up program more efficient.

Table 3:
Medication and Fluid Administration

Characteristics		**No. of Respondents**
Oxytocin	Oxytocin administered	159(97.5%)
	No oxytocin administered	4(2.5%)
Antibiotic	Antibiotic administered	21(12.9%0
	No antibiotic administered	142(87.1%)
Intravenous fluid	Intravenous fluid administration	9(5.5%)
	No intravenous fluid administration	154(94.5%)
Nevirapine (NVP) /Zidovudine (AZT) Prophylaxis Post Delivery	NVP/AZT administration	163(100)
	Not administered	0.0
Prophylactic Vitamin K	Vitamin K administration	159(97.5%)
	Not administered	4(2.5%)

Table 9
Dried Blood sample collection

	Frequency	**Percentage**
DBS	159	97.5
DBS not taken	4	2.5
TOTAL	163	100

The average number of pregnancies per HIV pregnant woman in Laikipia County was two. This has been contributed by the education level of the HIV pregnant women which has enhanced knowledge, acceptance, accessibility and utilization of family planning services. The study shows that the average number of visits among HIV-positive pregnant women was at least four times which is acceptable by the World Health Organization.

The regular attendance has been attributed to the educational level of the pregnant women, constant follow-up and social support from the partners.

The study showed that the majority of the HIV-positive pregnant women had their deliveries in the hospital hence they were done by skilled attendants. This has been contributed by free maternity services under Linda Mama Initiative rolled out in 2013 by the government of Kenya.

The study also showed that a high proportion of HIV-positive pregnant women had Spontaneous Vaginal Deliveries (SVD). A few had caesarian sections because any delay in labour progress increases the chances of transmission of HIV to the newborn as many deliveries were done in the hospital.

The duration of labour among the majority of HIV pregnant women was less than 12 hours. This was quite significant because the faster the process of labour the lower the chances of transmission of HIV to the newborn.

In this study, it was found that only a few HIV pregnant women developed postpartum haemorrhages and were managed effectively by skilled health workers. The complications were prevented and this could be as a result of proper monitoring of the progress of labour and managing any arising complications urgently.

The second stage of labour includes the administration of oxytocin to every mother who has been delivered at any health facility. This study showed that the majority of the women received the oxytocin injection. This shows the availability of emergency drug supply in the hospital and well-trained skilled attendants. The study also showed that a few HIV pregnant women received antibiotics. The prophylactic antimicrobials were given with suspicion that some women have the possibility of developing sepsis.

The use of misoprostol in the management of postpartum haemorrhage is routinely used in the hospital. This study showed that a few HIV pregnant women received misoprostol to prevent excessive bleeding. This showed knowledge and skills among health workers and the availability of emergency medicines. The study showed that all newborns born had an average weight of 2.5-3.0 kg at birth. This has been contributed by the use of IFAS and good nutritional counselling and the availability of food.

The result also shows that majority of respondents had an APGAR score of above 8. The conclusion was that majority of the newborn did not get asphyxia. A High Apgar of above 7 is a good indication of good health for newborns at birth. The results show that Tetracycline eye ointment and Vitamin K were the most administered medication to infants after delivery of the newborn and no further medication was given.

The relationship between Apgar score and birth outcomes of HIV-exposed neonates born in Nyahururu County Referral Hospital was also done. The interpretation of this was that there was a significant relationship between Apgar score and weight is an indication of good health for children born by HIV-positive mothers in Laikipia County.

The study showed that a large proportion of newborns had a Dried Blood Sample (DBS) taken immediately after birth. This is significant in the determination of all

exposed infants' rate of positivity after six months of their lives. This will also give a glimpse of the effects of prophylactic ARVs on newborns.

Conclusions

From the results, it is shown that is a need for active monitoring of uptake of antenatal care and prophylactic antiretroviral medication programs to encourage pregnant women who are infected with HIV to attend the clinics to minimize the rate of transmission of the infection to the unborn babies hence making the program successful.

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Author Contributions

All authors contributed to this script through the conceptualization of the topic, manuscript development, data collection and analysis.

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Conflict of interests

The authors have no competing interest in this manuscript submitted for publishing.

Availability of data

This data is the original work of the authors. No data has been published in any other journal

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