ACCEPTANCE OF COUNSELING, HIV TESTING AND PROPHYLACTIC USE OF NEVIRAPINE IN LABOUR AND IMMEDIATE PUERPERIUM AT MUHIMBILI NATIONAL HOSPITAL, TANZANIA.

By

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A dissertation submitted in (partial) fulfillment of the requirement for the degree of Master of Medicine (Obstetrics and Gynaecology) of the University Of Dar-es-salaam.

University of Dar-es-Salaam.

2005

CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by the University of Dar-es-Salaam, a dissertation entitled: *Acceptance of counseling, HIV testing and prophylactic use of Nevirapine in labour and the immediate puerperium at Muhimbili National Hospital, Tanzania,* in partial fulfillment of the requirements for the degree of Master of Medicine (Obstetrics and Gynaecology).

.....

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Date: 17/11/05

DECLARATION

AND

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I, Matilda Michael Ngarina, hereby declare that this dissertation is my own original work and it is a product of my own efforts and that it has not been presented and will not be presented in any other University for a similar degree award.

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Glory, praise and honors be to GOD for taking me through this work and my studies at large. AMEN.

DEDICATION

To my husband Martin, my parents Michael and Suzy Ngarina and my parents in- law, Ndeletwa and the late Alfred Mosi.

ABSRACT

Background: Mother to child transmission contributes significantly to the incidence of HIV in our country. A PMTCT program exists in MNH and some surrounding public hospitals since 2000. In spite of this it has been observed that a substantial number of women delivering at MNH have not had VCT and therefore are not benefit from the PMTCT intervention.

Objective: To determine the acceptance of counseling, voluntary HIV testing and prophylactic use of Nevirapine among pregnant women during labour / immediate postpartum at Muhimbili National Hospital.

Methodology:

Study setting: The labour ward of Muhimbili National Hospital.

Study design: Descriptive Cross-sectional study.

Study population: All pregnant women delivering at MNH during the study period of 3 months. (12thAugust – 4thNovember 2004)

Sample size: 885 women with unknown sero-status and 355 women who were sero-negative more than 3 months prior to delivery.

Data collection: Trained counselors invited all women who met inclusion criteria as they were admitted. Women who accepted counseling were taken to private rooms for discussion and those who consented were screened for HIV using rapid tests. Direct observed therapy with Nevirapine was done. Data was filled in a structured questionnaire.

Results: The overall acceptance of pre-test counseling in labour among women with unknown sero-status was 71.7%, and voluntary HIV testing 56%. Among women with unknown sero-status who accepted pre-test counseling in labour, 78.9% accepted HIV testing and 8.6% of these were diagnosed to be HIV infected.

The overall acceptance of pre-test counseling in labour among those who were sero-negative more than 3 months prior to delivery was 70.5% while that of counseling and voluntary HIV testing was 64.1%. Ninety-one percent of women in this group accepted HIV testing in labour ward and 6% were diagnosed to be HIV infected.

Eighty-three percent of women diagnosed to be HIV infected from the unknown sero-status group accepted NVP while all HIV infected women from the group of women who were initially sero-negative accepted prophylactic Nevirapine.

Conclusion and recommendation: The results of this study show that HIV testing during labour and use of prophylactic ARV is acceptable in our setting. Acceptance of counseling, testing and use of NVP was higher among women who had HIV test during antenatal period compared to women who were admitted with unknown serostatus.

Women with unknown serostatus in labour and those with a negative test more than three months prior to admission in the labour ward should be offered counseling and testing services in order to prevent MTCT of HIV.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Clinic
ARV	Anti-Retroviral drugs
ELISA	Enzyme Linked Immunoabsorbent Assay
HIV	Human Immunodeficiency Virus
MNH	Muhimbili National Hospital
MTCT	Mother to Child Transmission
MIRIAD	Mother Infant Rapid Intervention and Delivery
NVP	Nevirapine
PMTCT	Prevention of Mother to child Transmission
UNAIDS	United Nations AIDS
USA	United States of America
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

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1. INTRODUCTION:

1.1 Background Information:

The HIV/AIDS pandemic is one of the greatest challenges to human kind in the twenty first century. Transmission is through exchange of infected body fluids as it is during sexual intercourse, blood transfusion, use of contaminated needles/instruments and from mother to child. No cure or effective vaccine has been developed so far. Prevention still remains the cornerstone in efforts to control the epidemic for the time being.

The syndrome was first described in 1981 and the virus was isolated in the USA by the end of 1983. Since then around 26.6 million people are estimated to be living with HIV in Sub-Saharan Africa out of whom 57% are women in their reproductive age.[1] In the year 2003, HIV/AIDS epidemic took the highest number of lives and produced the highest number of new infections ever since this epidemic started. Five million people became infected of which 800,000 were children under 15 years of age. Three million people died of AIDS worldwide in 2003 alone.[1]

About 1.8m Tanzanians were estimated to be living with HIV (840,000 males and 960,000 females) in the year 2003.[2] In the same year 18,929 new AIDS cases were reported. Seven hundred and fifty four (4%) of the AIDS cases reported in 2003

were below 15 years of age and most of these were likely to have acquired the infection through MTCT.[2]

Commenting on the UNAIDS report on rates of new infection and death from HIV 2003, UNAIDS Executive Director Peter Piot said that the current global efforts remain entirely inadequate for an epidemic that is continuing to spiral out of control. The report blames African countries for not implementing even the most basic cost effective HIV preventing efforts like VCT and PMTCT.

HIV imposes a very big challenge to obstetricians and pediatricians. Women in the reproductive age are at increased risk of acquiring the infection without their knowledge and so are their newborns. A pregnant woman has a 1 in 4 chance of passing HIV virus to her baby if she is not treated.[3] Without intervention; the risk of MTCT of HIV is estimated to range from around 15 - 25% in Europe and the USA; while it is 15 - 40% in the developing countries.[4]

Factors influencing MTCT include viral factors such as (HIV_1, subtype C, and viral load >1,000 RNA copies/ml), maternal factors such as (low CD4 count, poor nutritional status, advanced disease state and lack of ARV treatment), obstetric factors like (prolonged rupture of membrane and episiotomies) and fetal/infant factors like (prematurity, mixed feeding and cracked nipples).

The mechanism and timing of transmission remain uncertain, however increasing evidence indicates that transmission occurs: in utero 25 - 40% of cases, intrapartum 60 - 75% of cases, and an additional risk of 14 - 29% that occurs with breastfeeding.[4] This suggests that most transmission occurs during the intrapartum period. When the virus is detectable within 48 hours of birth, an infant is considered to have been infected in utero. Intrapartum infection is assumed, if viral studies are negative during the first week of life but become positive between 7 – 90 days.[4]

The ultimate goal of public health programmes for PMTCT is to save the lives of large numbers of children born to HIV infected mothers. Prevention of MTCT can be implemented primarily by prevention of HIV infection in young women and men of reproductive age and prevention of pregnancy in those who are already infected by using family planning methods. Those who decide to get pregnant or know their positive serostatus while pregnant ideally should be put on prophylactic ARV therapy or treatment. Women must be empowered by being given correct and adequate information on how to take care of themselves and prevent MTCT. Infant feeding options information should be given particularly exclusive breastfeeding for six months in order to minimize transmission. Currently many women get pregnant without knowing their HIV sero-status. They will benefit from counseling and testing for HIV and the infected ones should be given prophylactic ARVs on top of other measures to prevent MTCT.

Several clinical trials as reviewed by Mofenson LM [5], showed that use of different ARV regimen could reduce the rate of transmission of MTCT from 24.5 - 1.5% in developed countries where infected mothers do not breastfeed. This is possible through counseling and testing for HIV among pregnant women and accepting to use prophylactic ARVs and exclusive replacement feeding.

Of special interest is the Uganda HIVNET 012 study which showed that an inexpensive (US$2), single dose regimen of Nevirapine given once in labour and once to the infant (within 72 hrs of birth) could reduce the risk of HIV-1 transmission during the first 14 –16 weeks of life by nearly 50% in breastfeeding population.[6] Nevirapine is a potent Non-Nucleoside Reverse Transcriptase Inhibitors, that is rapidly absorbed orally (> 90%) reaching a peak plasma concentration by 4 hours. It has a rapid trans-placental passage and has half-life of 40hrs and 60% binds to plasma protein.[6]

Nevirapine can cause rash, hepatotoxicity and hypersensitivity syndrome especially to patients on chronic administration for treatment. These toxicities have not been reported in women or infants receiving two-dose Nevirapine for prevention of perinatal transmission.[6] Nevirapine can prevent deaths caused by HIV infection so implementation should not be delayed by concerns about its toxicity.[7]

Drug resistance caused by single dose NVP in PMTCT has also been a concern. A statement release from the United Nation's National Institute of Health that "WHO/UNAIDS continue to support use of NVP for PMTCT of HIV and it should be included in the minimum standard package of care for HIV positive women for PMTCT".[8] Resistant mutations in women receiving single dose NVP have previously been reported to be undetectable at 12 months postpartum.[9] New emerging information suggest that this may not be true.

With increasing knowledge about MTCT of HIV and possibilities of preventing transmission by using several regimens it has been recommended that voluntary counseling and testing and use of ARV therapy should be available to all pregnant woman. Voluntary counseling and testing is necessary because not only does it make a woman aware of her HIV status but it offers substantial additional benefits like improved decision making, ability to plan for future health and well-being of families and prevent subsequent sexual transmission. Barriers to expansion and utilization of such services in developing countries include poor infrastructure, cost of delivering the service, stigma and discrimination, ignorance, scarcity of trained manpower and inability to afford treatment for those infected. A lot of effort is being put to ensure that prenatal counseling and testing is done but still a large number of women (world wide) deliver without knowing their sero status.

1.2 LITERATURE REVIEW:

Counseling and voluntary testing is recognized as an important strategy in HIV/AIDS control and prevention. It is an entry point to several interventions, including PMTCT, access to care and treatment as well as in making important life decisions such as marriage and child bearing. It is a cost effective strategy in HIV prevention but still inadequately accessible in many parts of Tanzania.

Only about 10% of Tanzanians who are infected with HIV know their status [10]. By April 2000 five sites in Tanzania (Bugando Medical Centre, Kilimanjaro Christian Medical Centre, Mbeya Referral hospital, Muhimbili National Hospital and Kagera Regional Hospital) had started a pilot project for strengthening ANC services, modifying obstetric practices, establishing VCT services, providing prophylactic ARV and infant feeding counseling.

Among the important findings observed in an evaluation carried out in 2002, was that 90% of pregnant women accept counseling and testing and 75% opt for breast-feeding.[11] It is estimated that 72,000 babies get infected with HIV every year among which 25,200 are infected through breast milk while the rest are infected perinatally.[12]

Without intervention the risk of MTCT of HIV-1, is approximately 25% in the USA. Approximately 6000 – 7000 HIV infected women give birth to approximately 280 – 370 HIV infected children. It is estimated that 40% of the

mothers of these HIV infected infants had not been diagnosed with HIV before labour and delivery.[13]

In the US and Canada three methods that is the opt in, opt out for mothers and mandatory testing of newborns was used to estimate perinatal testing acceptance rate among delivering women. The opt in method gave testing rates of 25 – 83%, the opt-out methods gave testing rates of 57 – 94% and the mandatory testing of newborns gave a testing rate of 89 – 93%.[14] So high rates of acceptance of HIV testing were obtained with the opt out and mandatory testing of newborns. Even with the increased awareness and better access to PMTCT facilities in developed countries like the USA yet there are some women who wouldn't test for HIV during the ANC.

During a one year period at the New Jersey community hospital Dr. Anthony al-Khan reported that expedited ELISA testing showed that women presenting for delivery who had no prenatal care were nearly four times more likely to be positive than those who cared to test for HIV i.e. 3.6% compared to 0.86%. In this study the rate of acceptance of HIV testing in women presenting in labour was 100%.[15]

Researchers at the University of Alabama, Birmingham showed that HIV testing during labour and subsequent treatment with intravenous AZT prevented 183 cases of infant HIV infection per 100,000 mother infant pair and could save as much as $58,000 per child. They also estimated that there is a 5% transmission

rate in labouring women. The lifetime cost of caring for an infected child is about $103,708.[16]

Researchers and Public Health authorities in a number of African countries have found that people attending VCT services prefer same day results. Studies done in S. Africa, Thai and Brazil [17, 18, 19] came out with the same findings. Two studies done in Kenya revealed that 96% of HIV tested women received rapid tests and learned of their HIV status compared to 65% of those who received conventional tests. Researchers also noted that most of the women opted for NVP single dose than ZVD twice daily from 36 weeks and then every 3 hours during labour.[20]

Other studies from African countries have shown that although 33 – 95% of pregnant women accept HIV-1 testing in antenatal settings offering VCT, between 25 – 55% of those consenting to antenatal testing do not obtain their results and only around 30% take prophylactic ARV during labour.[20, 21, 22, 23]

In the MIRIAD study (a multicentre study done in the USA) where OraQuick rapid HIV-I antibody test was used to test women who do not know their HIV status late in pregnancy or at the time of delivery; 12 HIV positive pregnant mothers out of 1771 were identified. The OraQuick results were also compared with Enzyme Immunoassay and Western blot. Data from this study indicate that rapid testing in labour is feasible and support using non-laboratory personnel to perform this rapid test.[13]

Preventive antiretroviral treatment is most effective when it is initiated early in pregnancy. However giving ARV therapy during labour and delivery, or even providing it to the new born within hours after birth can reduce MTCT by half.[24] In view of this benefit, pregnant women should be offered routine counseling and testing during labour and delivery and take ARV prophylaxis if this was not given in the antenatal period. The Centers for Disease Control and Prevention in the USA is now helping states to develop and implement protocols for HIV testing during labour and delivery in order to promote testing in this setting as a standard of care.

The MIRIAD study was also done in 4 other different hospitals in Chicago from Jan – July 2002. From 5771 women admitted in the labour and delivery units 514 (9%) had not tested for HIV. Of these 30 women (6%) were not fit for participation, 104 (20%) were counseled but refused testing and 380 (74%) gave informed consent and were enrolled. Three women were identified as HIV infected and ARV therapy was administered to mothers and infants during labour and delivery. None of these infants became HIV infected.[25]

Very few studies on HIV testing in labour and delivery have been done in African Settings. Factors related to acceptability of testing for HIV among pregnant women presenting in labour in Kigali Rwanda were investigated for 2 months in 2001. Researchers noted that only 36.2% of women in the sample knew their HIV status and it was through VCT done during the antenatal period. After counseling

74.2% accepted testing for HIV and of these 15.8% were HIV infected. The reason for refusal in two thirds of cases was that they had tested before. Women whose partners had skilled and well paid jobs were about 4 times more likely to accept HIV testing than those with unemployed partner. Also women who were 35 years or older had a higher rate of acceptance than the younger ones.[26]

Looking at the cascade of utilization of PMTCT services at Chipata Clinic, Lusaka, Zambia from September – December 2002, it was observed that out of 9,419 women who attended ANC, 4823 (51.2%) were offered VCT services. Out of the 4823 women who were offered VCT, 2363 (49%) accepted HIV testing. Only half of those who accepted testing wanted to know the results. Amazingly again, only 15.7% of those who knew their results accepted to use ARV therapy. The prevalence of HIV in this study population was 23%.[23]

Access to VCT services to the entire population has been improved in Tanzania by opening VCT sites in the country. There were a total of 100,328 clients from 1999 to Dec 2003. Of these 48,017 were new client for 2003 alone. Eighty three percent consented for HIV test and the overall prevalence was 23.6%.[2]

Acceptance of HIV counseling and testing and participation in PMTCT intervention among antenatal mothers was studied in Dar es Salaam, Tanzania from June 1996 – May 1998. Among the counseled pregnant women 76.4% accepted testing for HIV. Of these 13.7% were HIV positive. Only 68.1% of the tested women returned for their results.[22] The acceptance was relatively high due

to proper counseling but uptake of the intervention was low. The study identified factors that influenced low acceptance of the intervention to prevent MTCT of HIV. These included the counseling technique used, suspicion of being already infected, fear of having to cope with the result should it be positive, fear of discrimination and domestic violence or divorce.

Repeat HIV testing especially for those who were tested early in pregnancy is very important in order to detect those who seroconvert so that proper measures to prevent MTCT can be taken. It is well known that concentration of HIV in blood is high during the few weeks between infection and seroconversion and this is a strong risk factor for transmission during delivery. A study on HIV seroconversion during pregnancy and risk for MTCT observed that the interval between last negative test and first positive test ranged between 98 – 211 days.[27]

The National Guidelines for PMTCT of HIV and VCT in Tanzania realize that it may not be possible to reach all pregnant women for VCT during the antenatal period and therefore propose that if VCT has not been possible at the Antenatal Clinic the woman who delivers at the maternity ward has the right to be given the opportunity to test during labour so that interventions during delivery and post natal advise on breast feeding can be provided. This has not yet been practiced in Tanzania and subsequently no studies have been done to assess how acceptable it is.

1.3 STATEMENT OF THE PROBLEM

AIDS is a fatal disease, which also drains ones economy. In Tanzania the cost of caring for such a patient from the time of falling ill to death is estimated to be as much as USD 600 in a country whose annual per capita income is USD 480. This figure does not include cost of ARV.[10] It is also very expensive to look after orphans especially HIV infected orphans.

Some labouring women in our labour ward do not know their HIV sero-status. A mini survey done for 2 weeks in labour ward (i.e. from 03rd – 16th May 2004) revealed that out of 384 pregnant women who were admitted 172 (45%) came for delivery without knowing their HIV sero-status.

The coverage and utilization of VCT services during antenatal period is not yet 100% due to lack of sufficient staff to handle client load, accessibility issues, fears of stigma and discrimination and low participation of men to the use of the service by their female partner.

Available literature suggest that women presenting for delivery with no prenatal care are nearly 3 - 20 times likely to be positive than those who cared to be tested.[15, 16]

The number of children infected each year in our country is a significant figure to bring about public health concern. Most children suffer because their parents are not aware of PMTCT services, or don't want to know their status, or refuse screening because of fear of discrimination and stigma or do not come across services that provide PMTCT. Prevention is easier and cheaper than caring for an HIV infected child as it saves time money and personnel.

Medical intervention can still be used late in pregnancy, intrapartum or immediately postpartum to reduce transmission through VCT and taking prophylactic ARV. Ideally, the child has the right to be protected from getting infected.

1.4 RATIONALE OF THE STUDY :

This study will help us know how acceptable counseling is, voluntary testing for HIV and use of prophylactic ARV in women admitted for delivery in our hospital. It will also disclose the factors associated with acceptance to testing and reasons for not testing. The rate of seroconversion in pregnancy will also be determined. The end result is to try to reduce the rate of MTCT of HIV in the study population and share the experience with the national program to influence increase coverage for testing women even during delivery.

1.5 Research Question

Do women delivering at Muhimbili National Hospital accept counseling, voluntary testing for HIV and participation in PMTCT programme?

2. OBJECTIVES

2.1 Broad objective

To determine the acceptance of counseling, voluntary HIV testing and prophylactic use of single dose Nevirapine among pregnant women during labour and the immediate postpartum at Muhimbili National Hospital.

2.2 Specific objectives

1. To determine the proportion of pregnant women with unknown sero status who accept counseling and voluntary testing for HIV during labour and the immediate postpartum period.
2. To determine the factors associated with acceptance of HIV testing among women with unknown sero status during labour and the immediate postpartum period.
3. To determine the proportion of pregnant women with unknown sero status who received antenatal pre-test counseling for HIV but didn't test.
4. To determine the proportion of women diagnosed to be HIV infected that accept single dose Nevirapine for PMTCT.

5. To determine the rate of seroconversion among pregnant women who were sero-negative three months or more prior to delivery.

3. METHODOLOGY:

3.1 Study setting

The study was conducted in the Labour Ward of Muhimbili National Hospital. This is the largest referral, consultant and University teaching hospital in Tanzania. Approximately 20 - 30 deliveries are attended in a day. Patients come from all over Dar es Salaam, public and private health facilities; with or without PMTCT program. Patients from several research projects are instructed to deliver at MNH. The hospital also receives few patients from neighboring districts like Kibaha-Pwani, Bagamoyo, Mkata, Chalinze, and Mkuranga and from private hospitals where VCT service is not routinely given.

3.2 Study design - Descriptive cross-sectional study.

3.3 Study period - From 12th August – 4th November 2004

3.4 Study population - All pregnant women who delivered at MNH labour ward during the study period.

3.5 Exclusion criteria

1. Women with known sero-status whose last test was done not more than three months prior to delivery.

2. Those who refused counseling or to engage in any discussion concerning the study. These were just counted but did no participate in the study.
3. Women with obstetric emergencies like severe anaemia in failure, cord prolapse, antepartum haemorrhage, eclampsia, obstructed labour and those with confirmed IUFD. These patients were too sick to engage in any discussion and might be having a dead fetus so no need of PMTCT intervention at this juncture.
4. Women with liver problems clinically presenting with jaundice as Nevirapine could worsen the condition.
5. Women admitted with severe pain or were approaching second stage of labour that ended up with bad obstetric outcome like stillbirth, early neonatal death and post-partum haemorrhage. Those who ended up successfully were offered immediate postpartum counseling and testing.

3.6 Research assistants and training

Four research assistants (nurse midwives with experience in VCT) assisted in counseling and data collection. They underwent a two days training course conducted by the main researcher where they were educated on the purpose of the study, how to select patients, consent form administration, counseling, screening blood for HIV, filling the questionnaire and administration of Nevirapine.

3.7 Piloting the questionnaire

This was done for two weeks prior to data collection to test the practicability of the questionnaire. Questions 11-14 were adjusted as the research assistants initially

misunderstood them. Thereafter the questionnaire was easily administered and brought up the intended information.

3.8 Data collection procedure

Research assistants identified eligible women as they were admitted. Antenatal clinic cards of those who have gone through PMTCT program are marked to show the sero-status of the woman. These cards were used to know if the woman was tested or not. Together with this every woman who was in a position to discuss was asked if she ever had pre-test counseling for HIV and if she knew the results.

Two groups of women were recruited simultaneously i.e. those with unknown sero status and those who were seronegative three months or more prior to admission for delivery. They all went through the same procedure. That is, they had the first examination done by the doctor on call or the main researcher. They were then taken to private rooms within the labour ward. Pretest counseling for HIV screening and reassurance to alleviate anxiety was done in these rooms.

An information form was read to the mother or given to her for self-reading. It included details of what the study was all about, its advantages and disadvantages. This was followed by filling of the first and second parts of the questionnaire and checking of understanding to find out whether the invited study subjects were ready to participate in the study or not.

For consenting women 5mls of blood was drawn from left arm and sent to the laboratory technician (in the same building) who did HIV testing. Counselors also performed HIV testing when the technician was not available.

HIV testing was done using two rapid tests as recommended in the national PMTCT guidelines. This was based on the recommended UNAIDS/WHO algorithm for rapid tests currently being used in PMTCT programs. The first test was Capillus test followed by confirming the positive samples with a second different test called Determine test. If a sample from a patient resulted into discordant results (indeterminate), ELISA test was done. For quality control of HIV testing, ELISA in the laboratory confirmed every fifth positive test and every twentieth test results.

While still in the private room post-test counseling was done and the patient was given results within 40 minutes.

For HIV positive mothers who accepted NVP prophylaxis a tablet of 200mg was administered. It was taken when the patient was confirmed to be on active phase of labour. Their infants were given Nevirapine suspension – 2mg/kg few hours after delivery.

Women who were eligible but came in advanced labour and there after had successful deliveries were counseled within 1 - 2 hours post delivery and those

who gave consent were tested. Post-test counseling was done and Nevirapine suspension was given to the infants of infected mothers.

Nevirapine was also given to those women who were HIV infected but for one reason or another they did not have the drugs with them (i.e. by forgetting it at home, or by loosing it, or getting early labour before getting the drug at the antenatal clinic) but these patients were not included in the study. So the research assistants made sure those women known to be HIV positive took drugs for prophylaxis.

Counseling on breastfeeding options was given to all but with specific instructions to those found to be infected and cannot afford replacement feeding. Emphasis was put on exclusive breastfeeding for a short period if possible not exceeding six months followed by abrupt weaning. Though this process started from the pretest stage it was intensified during posttest counseling. Mothers were advised on either exclusive breast-feeding for 4 - 6 months or exclusive replacement feeding. Mixed feeding was discouraged.

This was a 24 hours exercise throughout the study period because many patients were admitted during the evening and night. The main researcher and the research assistants divided among themselves so that every shift had someone to conduct the study.

Those women who did not consent for participation were assured of the same quality of care as any other patient i.e. their decision would not deny them the right of being treated properly. They were only asked to give reasons for refusing. The main researcher supervised data collection and entered data in the computer daily.

3.9 Data management and analysis

Data were entered into a computer and cleaned by the main researcher herself. Analysis was done by EPI Info 6 and SPSS software, which was used to do the Multivariate analysis. Women with unknown sero-status and those who tested negative three months ago or more prior to delivery were analyzed differently. Chi-square test was used to test the statistical significance where by a P – value of ≤ 0.05 was taken as statistically significant. A biostatistician from MUCHS was consulted for statistics and data analysis.

3.10 Limitations of the study:

Labour pains and anxiety might have influenced proper participation. Research assistants provided reassurance and comfort to the patients to the best of their knowledge and ability. Analgesics were given to those who needed them. Those with severe pain were counseled during the immediate postpartum period.

Some of the patients didn't volunteer the truth about their HIV status. The ANC cards were used to try to identify those who attended various PMTCT programmes

as there were marks put on the cards. Stigma of HIV forced some women to alter the serostatus sign on the antenatal card.

Muhimbili National Hospital is a referral hospital hence majority of the admissions are emergencies or complicated cases. Some women are usually too sick to be counseled.

3.11 Ethical issues

Permission to do this study was given from MUCHS and MNH ethical committee after addressing the following issues;

Confidentiality and privacy were observed by using four private rooms within the labour ward.

Labour is a stress-full situation and VCT is thought to add on even more stress We tried our level best to give education, reassurance and comfort and we assured all those who refused testing of the same quality of care as other patients. In reality counseling and testing for HIV gives the woman the information and support she needs to understand the choices for maintaining her and her infant's health. Prophylaxis NVP for PMTCT was given to infected mothers and their infants.

Other infected women without NVP prophylaxis but wished to use prophylaxis were offered some but were not included in the study.

Nevirapine is said not to cause side effect especially when given as single dose. But it may cause rash, fever, arthralgia, hypersensitivity syndrome and hepatotoxicity. Patients with features of liver failure were excluded in the study for fear of hepatotoxicity. Fortunately we didn't observe any such side effects.

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HIV infected patients were referred to care and treatment programs established in our center. Their infants were also referred for follow up in PMTCT clinics.

4. RESULTS

A total of 1897 women delivered in our labour ward during the study period. Out of these 885 (46.7%) were of unknown sero-status and 1012 (53.3%) were of known sero status. Of the 1012 women with known sero-status, 715 (70.6) were sero-negative, out of whom 355 (49.7%) were tested more than three months ago (figure 1).

Among women with unknown sero-status, 383 accepted pre-test counseling, 151 refused pre-test counseling and 351 were not approached as they were very sick. So the overall proportion of women who accepted counseling was 383/(885-351) [71.7%]. Of those who accepted pre-test counseling 302/383 (78.9%) accepted HIV testing. Hence the overall proportion of women who accepted counseling and voluntary HIV testing was 302/534 (56.6%).

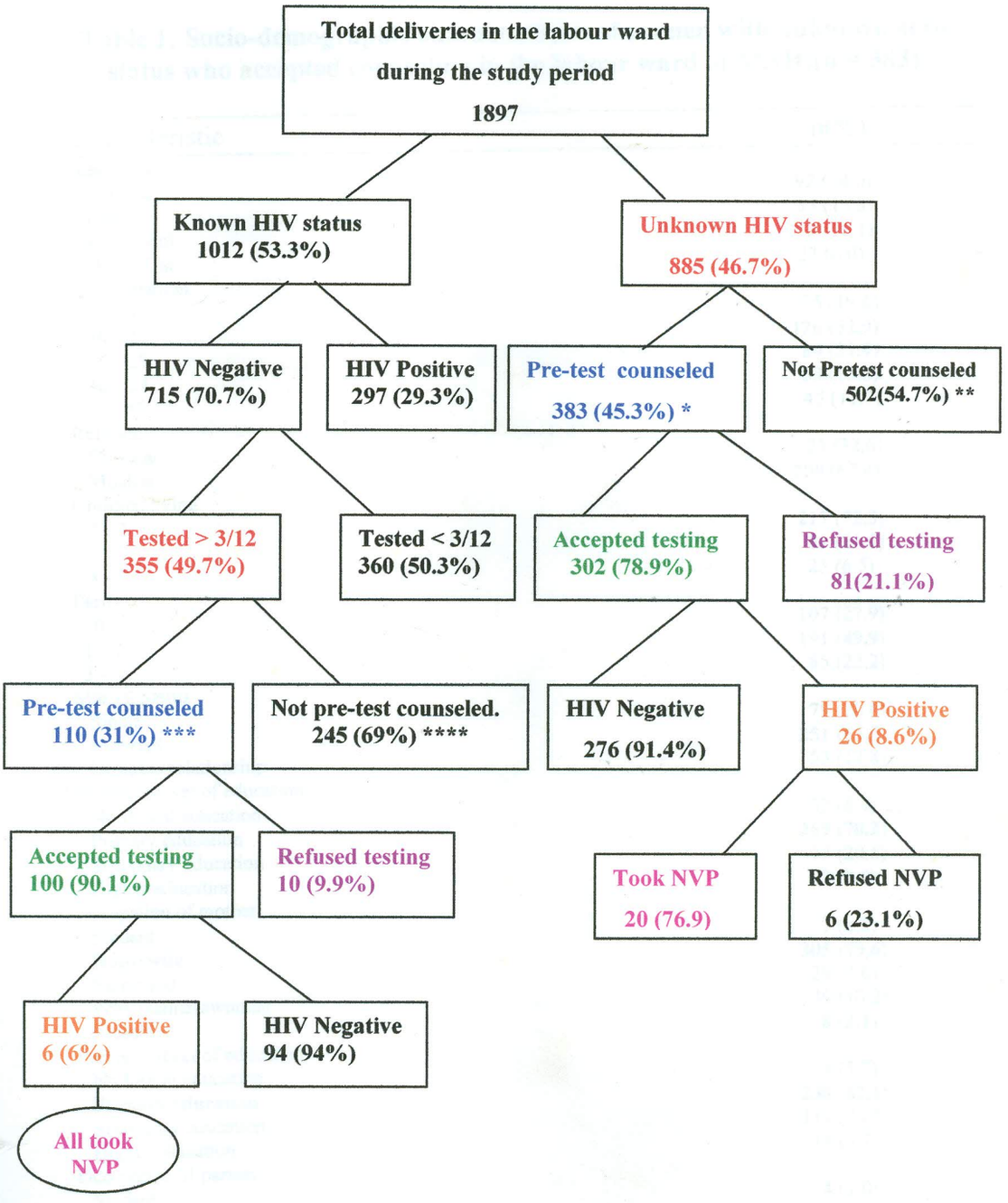
Among women who were sero-negative more than 3 months prior to delivery, 110 accepted pre-test counseling, 46 refused and 199 were too sick to be interviewed. So the overall proportion of women who accepted counseling was 110/156 (70.5%). Of those who accepted pre-test counseling in this group, 100/110 (90.1%) accepted

voluntary HIV testing therefore the overall proportion of women who accepted counseling and testing was 100/156 (64.1%)

Of those women with unknown sero status that accepted pre-test counseling and voluntary HIV testing, 26 (8.6%) of them were diagnosed to be HIV positive. Seventy-seven percent of women diagnosed to be HIV infected accepted Nevirapine prophylaxis.

Of those who were sero-negative more than three months before delivery and accepted pre-test counseling and voluntary HIV testing 6 (6%) were diagnosed to be HIV positive (i.e. seroconverted during pregnancy). They all took Nevirapine prophylaxis under supervision (DOT).

Figure 1: POPULATION PROFILE



* 346 – counseled before delivery; 37 - counseled after delivery. (total 383)
** 151 – refused counseling; 351 - too sick to be counseled. (total 502)
*** 102 – counseled before delivery; 08 – counseled after delivery. (total 110)
**** 46 refused counseling; 199 – too sick to be counseled. (total 245)

Table 1: Socio-demographic characteristics of women with unknown sero status who accepted counseling in the labour ward of MNH:(n = 383)

Characteristic	n(%)
Residence:	
Temeke	92 (24.0)
Ilala	53 (13.8)
Kinondoni	215 (56.1)
Out of Dar	23 (6.0)
Age of patient	
14 – 19	75 (19.6)
20 – 24	**126 (32.9)**
25 – 29	84 (21.9)
30 – 34	53 (13.8)
35 - 45	45 (11.7)
Religion	
Christian	125 (32.6)
Muslim	**258 (67.4)**
Children living	
0 – 1	**217 (72.3)**
2 – 3	81 (21.1)
4 – 7	25 (6.5)
Parity	
0	107 (27.9)
1 – 2	**191 (49.9)**
3 – 9	85 (22.2)
Marital Status	
Single	79 (20.6)
Married	**251 (65.5)**
Unstable relationship	53 (13.8)
Mother's level of education	
No formal education	32 (8.4)
Primary education	**269 (70.2)**
Secondary education	79 (20.6)
Higher education	3 (0.8)
Occupation of mother	
Student	2 (0.5)
Housewife	**305 (79.6)**
Employed	29 (7.6)
Petty businesswoman	39 (10.2)
Peasant	8 (2.1)
Partner's level of education	
No formal education	14 (3.7)
Primary education	**238 (62.1)**
Secondary education	117 (30.5)
Higher education	14 (3.7)
Occupation of partner	
Student	4 (1.0)
Unemployed	71 (18.5)
Employed	132 (34.5)
Petty businessman	**163 (42.6)**
Peasant	13 (3.4)

The mean age of women with unknown sero status who accepted pre-test counseling was 25.2 years, the youngest being 14 and the eldest 45 years old. Majority of them, 251 (65.5%) were married, 269 (70.2%) had completed primary school education, 217 (72.3%) had either one or no living child and 80% were unemployed (table 1). There were no differences between the socio-demographic characteristics of women with unknown sero-status and those who were sero-negative more than 3 months prior to delivery.

Table 2: Predictive factors of acceptance of voluntary HIV testing among pregnant women with unknown sero status delivering at MNH (Univariate analysis).

Characteristic	no counseled	accepted testing (%)	p-value
Age in years			
<30	306	240 (78.4)	
≥30	77	62 (80.5)	0.688
Counselor			
≥ 3 years experience	222	197 (88.7)	
< 3 years experience	161	105 (65.2)	**0.000**
Marital Status			
Single	79	67 (84.8)	
Married	251	196 (78.1)	
Unstable relationship	53	39 (73.6)	0.265
Religion			
Christian	125	105 (84.0)	
Muslim	258	197 (76.4)	0.086
Mother's level of education			
No formal education	32	25 (78.1)	
Primary education	269	214 (79.5)	
Secondary & higher	82	63 (76.8)	0.950
Occupation of mother			
Student	2	2 (100)	
Housewife	305	243 (79.7)	
Employed	29	22 (75.9)	
Businesswoman	39	28 (71.8)	
Peasant	8	7 (87.5)	0.673
Occupation of partner			
Student	4	4 (100)	
Unemployed	71	56 (78.9)	
Employed	132	103 (78.0)	
Businessman	168	128 (78.5)	
Peasant	13	11 (84.6)	0.844
Antenatal Counseling			
Had Counseling	204	165 (80.9)	
Never Counseled	179	137 (76.5)	0.299
Antenatal HIV testing *1			
Tested	111	101 (91.0)	
Never tested	93	64 (68.8)	**0.000**
Time of counseling			
Intrapartum	346	277 (80.1)	
Postpartum	37	25 (67.6)	0.077

*1 n=165 (i.e. those who were counseled antenataly)
Statistically significant p-values are in bold.

In the univariate analysis of factors that affected acceptance of HIV testing in labour and immediate postpartum, it was noted that the counselor's experience of more than

3 years and antenatal testing significantly improved acceptance (p – value ‹ 0.001 in both cases) – table 2.

Table 3: Predictive factors of acceptance of voluntary HIV testing among pregnant women with unknown sero status delivering at MNH; multivariate analysis.

Characteristics	p – value
Age in years	
< 30 years	
> 30 years	0.492
Residence	
Temeke	
Ilala	
Kinondoni	
Out of Dar	0.857
Counselor	
< 3 years experience	
> 3 years experience	**0.000**
Occupation of mother	
No income	
With income	
Peasant	0.376
Occupation of partner	
No income	
With income	
Peasant	0.874
Religion	
Christian	
Muslim	0.145
Antenatal Counseling	
Had Counseling	
Never had Counseling	**0.023**
Antenatal HIV testing	
Tested	
Never tested	**0.000**
Time of counseling	
Day	
Night	0.301
Marital status	
Single	
Married	
Unstable relationship	0.738
Intrapartum / postpartum counseling	
Intrapartum	
Postpartum	**0.047**

Statistically significant p-values are in bold.

When all the predictive factors were analyzed together (multivariate analysis), it was observed that, counselor's experience of more than 3 years, antenatal counseling, antenatal HIV testing and intrapartum counseling had a significantly higher acceptance rate (table 3).

Table 4: Antenatal counseling and HIV testing among women delivering with unknown sero status and reasons for refusing antenatal screening

	N=383	(N) %
Got antenatal counseling	204	53.3
Never had antenatal counseling	179	46.7
	N=204	**(N) %**
Tested after antenatal counseling	111	54.4
Never tested after antenatal counseling	93	45.6
Reasons for refusing antenatal testing	**N=93**	**(N) %**
Can't handle bad results	48	51.6
Long waiting time	16	17.3
Fear of stigma and discrimation	11	11.6
Denial	8	8.6
Discouraged by partner	8	8.6
Under age	2	2.2

Among women with unknown sero status, who had received antenatal pre-test counseling, 93 (45.6%) refused HIV testing at the antenatal clinic.

One seventy-nine women (47%) who accepted pre-test counseling in the labour ward were never offered pre-test counseling during the antenatal period as they were attending clinics that did not have VCT – PMTCT program.

The main reason for refusing HIV testing during the antenatal period was noted to be the same as that of refusing HIV testing in labour i.e. women not being ready to handle bad results.

5. DISCUSSION:

This study showed that when pregnant women with unknown sero status came for delivery and were introduced to counseling, HIV testing and taking prophylaxis, ART the overall acceptance to counseling was 71.7% while that of HIV testing was 56.6%. The acceptance of HIV testing among those who accepted pre-test counseling in the labour ward was 78.9% and that of taking prophylactic ARV's was 77%.

Similar findings of acceptance of HIV testing in labouring women have been reported from studies done in Chicago, Kigali – Rwanda, and the USA.[25, 26, 28] Higher acceptability rates have been observed in a study done among labouring women at the New Jersey Community hospital, where the acceptability was 100%.[15]

Twenty-one percent of women with unknown sero-status who were counseled in our labour ward refused testing for HIV despite being well informed about the mode of transmission of the virus to their infant and how this could be minimized by giving prophylactic ARV's. The reasons they gave as to why

they would not test included; not being ready to handle bad results, fear of stigma and discrimination and prior discouragement by partner. Few women were of the opinion that they were not infected. Generally it appeared that in some women the fear of HIV testing exceeded the woman's concern for transmitting HIV to her infant. Labour pains were not mentioned as a reason for refusing testing.

The overall acceptance rate of counseling women who were sero-negative more than 3 months prior to delivery was 70.5% while that of HIV testing was 64.1%. Acceptance of HIV re-testing among those pregnant women who were sero-negative more than three months prior to delivery and accepted pre-test counseling in labour was 91%. These testing rates were slightly high than those of the group of women with unknown sero-status possibly because these women were much more sure of good results as they had good results antenatally. Unfortunately 6% of those who were previously sero-negative had seroconverted and these women accepted the results and they all took Nevirapine for prophylaxis.

In a study done by Roongpisuthipong it was noted that 0.04% of pregnant women seroconverted during pregnancy and this happened at a median of 146 days since the last negative test.[27] The seroconversion rate noted in this study is higher than what was seen in STD clinics in the USA where the rate was 4%[29] and lower than 20%, which was found among injection drug users in the USA.[30] These findings would suggest repeating of HIV test close to delivery or

during labour and delivery for most women who had the test more than three months prior to delivery. Nevertheless bigger follow up studies are needed in order to know the rate of seroconversion in pregnancy.

In multivariate analysis, this study identified four factors that significantly influenced acceptability of HIV testing in labour and immediate postpartum. These included; counselors' experience of three years or more, intrapartum counseling, having pre-test counseling service and HIV test during antenatal period. Some of these factors were also noted in the univariate analysis.

Counselors who had done this job for three years or more were good in counseling women and most of their clients agreed to test. This is quite reasonable, as it is well known that practice makes perfect. The more you practice the better you become.

Women with unknown sero-status but who were exposed to HIV counseling and testing antenatally easily accepted testing during labour. This could have been so due to the fact that it was not the first time they heard of the same word of wisdom. Repeated information makes it easy for someone to understand and make up her mind.

Those women who came for delivery without their test results also easily accepted to re-test during labour. This sounds logical, as these were the ones who had no problems in accepting testing during the antenatal period only that, unfortunately they couldn't get hold of their results before they went in labour.

This suggests the use of rapid test and issuing of same day results in the antenatal clinics is very important. It also calls for increasing expertise in counseling and the number of staff to handle all clients so that pre and post-test counseling are done on the same sitting.

Counseling and testing before delivery was significantly acceptable than after delivery. The possible explanation to this could be that, the sight of the baby or the difficulties that the woman might have undergone during the second stage of labour might over-occupy the woman's mind and she might need longer time (probably days) to cool down and concentrate on what the counselor talking about. This finding further point to the fact that labour pains were not a major issue that interfered with acceptance of HIV testing.

A study on HIV testing in labour done in Kigali – Rwanda found out that age of the woman and profession of the partner significantly affected acceptance.[26] Women of 35 years and more and those who had skilled and employed partners accepted easily to test. At the same time studies done in the USA revealed that women who were 30 years and below, black or Hispanic, less than 32 weeks pregnant and who had no prenatal care easily accepted HIV testing in labour.[27]

These findings are completely different from those of this study whereby age, time of counseling and profession of both mother and partner did not affect acceptance. This could be because this study had very few partners who were professionals. No socio-demographic characteristic influenced acceptance in

this study. This could probably be due to difference in cultural setting, economic status and level of education and perception of HIV/AIDS in our country as compared to the USA and Rwanda.

The coverage and utilization of VCT services during antenatal period is not yet 100% in Dar es Salaam. In this study 46.7% of women who accepted pre-test counseling in the labour ward never had the opportunity of getting such services during the antenatal period as they were attended in clinics that had no such service. Nevertheless 45.6% of women who had this opportunity refused HIV testing during the antenatal period the main reason being afraid of handling bad results. The remaining 54.4% of those who had a golden opportunity tested but did not take results.

Other studies have shown that although 75 - 95% of pregnant women accept HIV–1 testing in antenatal settings offering VCT, between 25 and 70% of these women do not obtain results.[20,21,22] This picture is almost the same as what was found in this study.

Accepting to use prophylactic antiretroviral drugs and actual use of the drug are two different things. One study found out that 60% of women who were diagnosed to be HIV-1 infected during the ANC screening accepted perinatal HIV-1 intervention but eventually only 15% of them used the drugs.[20] Another study found out that 67% of women who were offered ANC pretest counseling accepted testing and 55% returned for results. Nevirapine was given to 30% of

them but only 20% took the drug.[32] Time lag between testing, getting the drug and keeping it till delivery could have contributed to the discrepancy between the number of women who tested positive and those who used Nevirapine. Also, may be many women did not come back to collect NVP because of the fear and stigma associated with HIV.

In this study, the use of Nevirapine was 77% among those who had unknown sero-status and 100% among those who had seroconvert in pregnancy. This is relatively higher than what was found in studies done by Malonza[20] and Temmerman[31] most probably due to Direct Observed Treatment (DOT) which we practiced.

The prevalence of HIV among women who had unknown sero-status and accepted HIV testing in the labour ward was 8.6%. This might have been even higher as it is speculated that those who refused counseling and testing were likely to be having a risky sexual behavior making them hesitant to test. We also could not approach women who were very sick as it would be unethical.

Studies showed that women presenting for delivery without prenatal care were nearly four times more likely to be positive than those who cared to test.[15] According to Centers for Disease Control and Prevention survey data, prevalence of HIV among pregnant women in the USA is approximately 0.17%. But unregistered women are at significantly higher risk of infection; that is; HIV prevalence among such women in Boston is 4.3% (25 times) and

19% (111.8 times) among drug users.[16] Chalemchockcharoenkit found that the prevalence of HIV in women who lack ANC care was 5.7% that was 2.6 times higher than that of pregnant women receiving ANC care.[32] On the other hand a study done in Rwanda revealed that the greater the number of pregnancies a woman has had the higher the likelihood of testing positive to HIV during labour.[33] Studies are needed to identify factors affecting HIV seropositivity in labour in our setting where mandatory screening of all parturients with unknown HIV status should be done.

6. CONCLUSION:

The proportion of women with unknown sero status delivering at MNH is high (47%) hence a significant number of women do not benefit from PMTCT services. In this study we were able to raise the percentage of women delivering with known status from 53% to 69%. Generally, a good number of women accept pre-test counseling, HIV testing and use of prophylactic ARV during labour and immediate post partum. Direct observed treatment improves the uptake of NVP during labour.

Counselors experience was an important determinant factor for acceptance of HIV testing in labour. Labour pains did not influence the decision of the woman

to test, rather it was noted that majority of women refused testing because they were not ready to handle bad results. Also a considerable number of women who get antenatal pretest counseling either do not test or do not go for results mainly because they are not ready to handle bad results.

The proportion of women who seroconverted in pregnancy in this study was high.

7. RECOMMENDATIONS:

From the findings of this study, I have the following recommendations:

1) Intrapartum HIV counseling, testing and giving direct observed prophylaxis should be done to all parturients delivering with unknown status in order to prevent MTCT of HIV. With proper counseling, privacy, analgesia and reassurance labour pains may not interfere with the woman decision to test.

2) Antenatal VCT services should be spread countrywide and be improved so that most of the women are tested for HIV before delivery. Actually we should start advocating for routine HIV testing during the antenatal period as it is done for other STD's

3) Training of health care professionals in counseling and management of HIV infected persons and integration of HIV VCT into various services such as prenatal care, STD and family planning services is very important.

4) For those women who are screened early in pregnancy re-screening should be done three month later so that those who seroconvert are not missed. We should keep on looking for all means to fight the virus. TOGETHER WE CAN FIGHT MTCT OF HIV.

8. REFERENCES

1. *UNAIDS AIDS epidemic update, December 2003.* Geneva: World Health Organization 2003.
2. Ministry of Health Tanzania Mainland. *National AIDS Control Program for Tanzania Mainland. HIV/AIDS/STI Surveillance reports no 18,* 2003.
3. Francoix-Xaveir Bagnond center at University of Medicine and dentistry of New Jersey reports. HIV Counseling and Rapid/Expedited Testing in Labour, 2003.
4. *UNAIDS AIDS epidemic update, December 1998.* Geneva: World Health Organization 1998.
5. Mofenson, L.M. MD. Overview of clinical trials on Prevention of Mother-to-child transmission of HIV; 2003.

6. Guay L, Musoke P, Fleming T, Bagenda D. Intrapartum and neonatal single dose nevirapine compared with zidovudine for prevention of MTCT of HIV, in Kampala, Uganda: HIVNET 012 randomized trial. *Lancet* 1999;354:795–802.
7. Stringer JS, Sinkala M, Rouse DJ. Effect of Nevirapine toxicity on choice of perinatal HIV prevention strategies. *AM J Public Health* 2002;92(3):365-6.
8. Joint UNAIDS/WHO press statement. WHO and UNAIDS continue to support use of Nevirapine for prevention of mother to child HIV transmission; March 2002.
9. Mofenson L M. MD. WHO consultative meeting report on the use of NVP for the PMTCT in women of unknown Sero-status; 2001.
10. *National Guidelines of VCT in Tanzania,* 2003.
11. Lyamuya E, Gasarasi DB, Kaaya E. Bakari M, Kwesigabo G, Mutembei A. Scientific report on the 2nd National Multisectoral AIDS Conference in Tanzania Dec.2002.
12. The United Republic of Tanzania – Ministry Of Health. *National Guidelines for Clinical management of HIV/AIDS*. April 2002.
13. Centers for Disease Control and Prevention, Division of HIV/AIDS prevention report. Rapid HIV Testing of women in labour and delivery. April, 2003. Available at dhaprti@cdc.gov and http://www.aidsinfo.nih.gov/guidelines/ Accessed March 12, 2004.
14. Centers for Disease Control and Prevention. HIV testing among Pregnant women----United States and Canada, 1998-2001. Morbidity and Mortality weekly report Nov 2002;51(45):1013-1016.
15. Mahoney D. Rapid HIV testing during labor may cut transmission; women with no prenatal care. Obstetrics and Gynecology news October, 2003. Available at http://www.findarticles.com/cf_dls/m0CYD/19_38/109025355/pl/article.jhtml Accessed March 16, 2004.

16. Stinger JS, Rouse DJ. Rapid testing and Zidovudine Treatment to Prevent Vertical Transmission of HIV in Unregistered Parturients: A Cost-Effectiveness Analysis. *Obstet and Gynecol* 1999;94:34-40.

17. Campbell, LM Hausler, Van Dyk. Lessons learned from a voluntary HIV counseling and testing programme in rural South Africa. XIV International AIDS conference, Barcelona, abstract Th Pe F8029, 2002.

18. Teeraratkul A. Rapid voluntary HIV testing in Labour, Bangkok, Thailand XIV international AIDS conference, Barcelona, abstract D11349, 2002.

19. Veloso VG. HIV rapid testing during the peripartum period followed by perinatal intervention in Brazil XIV International AIDS Conference, Barcelona; abstract Th PeB7248, 2002.

20. Malonza IM, Richardson BA, Kreiss JK, Bnayo JJ, Stewart GC. The effect of rapid HIV-I testing on uptake of perinatal HIV-I intervention; a randomized clinical trial. *AIDS* 2003;17(1):113-8.

21. Cartoux M, Meda N, Van de Perre P, Newell ML, and the Ghent International Working Group on MTCT of HIV. Acceptability of Voluntary HIV testing by pregnant women in developing countries: an international survey. *AIDS* 1998;12:2489-2493.

22. Kilewo C, Massawe A, Lyamuya E, Semali I, Kalokola F, Urassa E. HIV Counseling and Testing of Pregnant Women in Sub-Saharan Africa. Experience from a study on PMTCT-1 in Dar es Salaam, Tanzania. *J Acquir Immune Defic Syndr* 2001;28:458–462.

23. Horizons report - HIV/AIDS Operation Research, Assessing feasibility, acceptance and cost of services in Kenya and Zambia December, 2003.

24. Wade NA, Birkhead GS, Warren BL. Abbreviated regimens of Zidovudine prophylaxis and perinatal transmission of the Human Immunodeficiency virus. *N Engl J Med* 1998:339:1409 –14.

25. Centers for Disease Control and Prevention. Rapid Point-care testing for HIV –1 during labor and delivery ---/Chicago, Illinois, 2002. Morbidity and Mortality weekly report of Sept, 2003;52(36):866-868.

26. Kowalezyk J, Jolly P, Karita E, Nibarere JA, Vyankandondera J, Salihu H. Voluntary Counseling And Testing For HIV Among Pregnant Women Tested In Labour In Kigali, Rwanda. *J Acquir Immune Defic Syndr* 2002;31(4):408-15.

27. Roongpisuthipong A, Siriwasin W, Simond RJ, Sangtaweesin V, Vanprapar N, Wasi C, Singhanati S; Bangkok Collaborative Perinatal HIV Transmission Study Group. HIV seroconversion during pregnancy and risk for MTCT. *J Acquir Immune Defic Syndr* 2001;26(4):348-51.

28. Carter M. Rapid oral HIV test during labour is feasible, acceptable, and accurate. AIDSmap news July, 2004. Available at www.aidsmap.com/en/news/ux/default.asp Accessed September 2004.

29. Otten MW Jr, Zaidi AA, Peterman TA, Rolf RT, Witte JJ. High rates of HIV seroconversion among patients attending urban sexually transmitted disease clinic. *AIDS* 1994;8(4):549-53.

30. Poundstone KE, Crape B, Jodhka UK, Bareta JC. Neighborhood Characteristics and HIV Seroconversion among Injection Drug Users in Baltimore, MD. Abstract #88650. kpoundst@jhsph.edu. Accessed Feb 2005.

31. Temmerman M, Quaghebeur A, Mwanyumba F, Mandaliya K. Mother-to-child HIV transmission in resource poor settings: how to improve coverage. *AIDS* 2003;17(8):1239-42.

32. Chalermchockcharoenkit A, Louisirirotchnakul S, Roongpisuthipong A, Sirimai K, Wasi C. Rapid HIV diagnostic test during the intrapartum period in Pregnant women who did not receive antenatal care. *J Med Assoc Thai.* 2002;85(6):703-8.

33. Silihu HM, Nnedu ON, Karita E, Vyankandindera J, Jolly PE. Predictors of HIV seropositivity following intrapartum voluntary counseling and testing among Rwandan women. *J Obstetrics and Gynaecology* 2003;23(6):632-6.

9. APPENDIX.

9. 1 QUESTIONNAIRE

Acceptance of Counseling, Voluntary testing of HIV and use of NVP among women delivering in the Labour Ward of Muhimbili National Hospital; Aug-Nov 2004

Identification number..... Registration number.....
Name of interviewer..... Time of counseling.....
Date of interview..... Cervical dilatation.....

N0.	ITEM	TO BE FILLED BY RESEARCH ASSISTANT	TO BE CORDED BY MAIN RESEARCHER
Social demographic characteristics (To be filled for all patient recruited in the study			
1	Residence: (Unapoishi)	1. Temeke 2. Ilala 3. Kinondoni 4. Out of Dar	1. [ ]
2	Age of patient (Umri wa mama)	.....	2. [ ]
3.	Religion (Dini)	1.Christian 2.Muslim 3.Others	3. [ ]
4	Children living (Watoto wanaoishi)	.....	4. [ ]
5	Parity (Umezaa mara ngapi)	.....	5. [ ]
6	Marital Status	1. Single 2. Married 3. Divorced 4. Unstable relationship	6. [ ]
7	No of years spent at school by mother (Miaka uliyosoma shule)	.....	7. [ ]

N0.	ITEM	TO BE FILLED BY RESEARCH ASSISTANT	TO BE CORDED BY MAIN RESEARCHER
8	Occupation of mother (Kazi ya mama)	1. Student 2. Housewife (mama wa nyumbani 3. Employed (mwajiriwa) 4. Businesswoman 5. Peasant	8.[ ]
9	No of years spent at school by partner (Miaka uliyosoma shule)	.....	9. [ ]
10	Occupation of partner (Kazi ya mme)	1. Student 2. Unemployed 3. Employed (mwajiriwa) 4. Businessman (mfanyabiashara) 6. Peasant	10. [ ]
Details on VCT (To be filled for all patients recruited in the study)			
11	Have you ever had VCT for HIV services? Umewahi kupata huduma ya ushauri nasaha na kupima virusi vya ukimwi	1. Yes (Ndio) 2. No (Hapana) (If no go to question 15)	11. [ ]
12	Where did you get the service? Ulipata wapi huduma hii	1. ANC (Klinik ya wajawazito) 2. NGO's (e.g. ANGAZA) 3. Others – (Nyinginezo)	12. [ ]
13a.	Were you tested for HIV? Ulipimwa ukimwi baada ya ushauri?	1. Yes (Ndio) 2. No (Hapana) (go to ques 14)	13. [ ]
13b.	If yes, when was the test done? Kama ndio kipimo kilifanywa lini?	1.	
14.	If No, why didn't you test? Kwa nini hukupimwa?	1. Not ready to handle results 2. I am not infected 3. Tear of stigma & discrimination 4. discouraged by partner 5. Others - mention	14. [ ]