

Prevention of vertical transmission of HIV in the Mpumalanga Province of South Africa: A cross sectional survey

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Abstract:

Introduction: South African women might experience challenges to utilise free prevention of vertical transmission of HIV services because not all pregnant women use these services.

Materials and Methods: Structured interviews were conducted with 200 mothers who had used these services. Checklists were used to record data from the women's and from their babies' files.

Results: Many women commenced prenatal clinic visits late during their pregnancies, allowing inadequate time for anti-retroviral drugs to suppress the maternal viral load to reduce the risk of HIV transmission. Most respondents used condoms irregularly during and after their pregnancies, increasing their risk for HIV re-infection and for HIV transmission to their babies. Few mothers adhered to exclusive breastfeeding for the first six months and few continued breastfeeding till their babies were 12 months old. Cotrimoxazole was not administered according to the country's guidelines. Out of the 200 babies, 18 tested HIV-positive at the age of six weeks.

Conclusions: Unless HIV-positive women use condoms consistently while pregnant and breastfeeding, and adhere to South Africa's national guidelines for infant feeding, the risk of vertical transmission of HIV might not be significantly reduced. Cotrimoxazole should be administered correctly to reduce the risk of HIV transmission.

Keywords: Anti-retroviral treatment (ART), Human Immuno-Deficiency Virus (HIV), infant feeding practices, prenatal care, prevention of vertical transmission of HIV

Abbreviations:

AIDS - Auto Immune Deficiency Syndrome

ANC - antenatal care

ARVs - anti-retrovirals

EBF - exclusive breastfeeding

HIV - Human Immune Deficiency Virus

NDOH - National Department of Health (of South Africa)

PCR - polymerase chain reaction

PMTCT - prevention of mother-to-child transmission (of HIV)

1. INTRODUCTION

An estimated 34.3 million people lived with the Human Immuno-deficiency Virus (HIV) globally in 2012, and 70% of them were in Sub Sahara Africa (SSA) [1]. In 2012, South Africa reportedly had the largest HIV-positive population in the world, totalling 5.6 million [2-3]. The HIV prevalence was 29.5% during 2011 and the average provincial prevalence of HIV infections, among pregnant women attending prenatal clinics in South Africa, ranged from 17.0% to 37.4% in the country's nine provinces [4]. The reported HIV-prevalence for the study area was 46.1% among women using prenatal clinic services during 2011 [4]. Due to the availability of free anti-retroviral treatment (ART) in South Africa, HIV-positive persons live longer and enjoy a better quality of life. This implies that more HIV-positive women could bear children than would have been the case without ART. There is a risk that HIV could be transmitted from the HIV-positive mother to her child during pregnancy,

birth and breastfeeding. This risk can be reduced if the pregnant women, the health care providers and the health care institutions adhere to the policies of South Africa's National Department of Health (NDOH) [5].

The program for preventing vertical transmission of HIV in South Africa requires pregnant women to use free HIV counselling and testing services early during pregnancy. If testing HIV-negative, the woman should be counselled to remain HIV-negative and use condoms effectively. If testing HIV-positive, post-test counselling should encourage her to disclose her HIV-positive status to at least one trusted person, to motivate her sex partner to get tested, to use condoms consistently to prevent re-infections and to use the prevention of vertical transmission of HIV services. Throughout her pregnancy and breastfeeding periods, it is essential that the prescribed anti-retroviral medications (ARVs) should be taken as prescribed. These ARVs should reduce the pregnant woman's viral load and increase her CD4 count, making herself healthier and reducing the risk of vertical transmission of HIV. The baby should be born in a hospital or clinic where the required care can be rendered to the mother and the baby [5]. The midwives should provide and record all relevant services including the HIV-positive status of the pregnant woman, the WHO stage of the HIV illness, monitor the viral load and CD4 count, ARVs administered, diagnose and treat any opportunistic infections, provide effective prenatal care and refer women timeously for appropriate specialised care, if required.

During 2001, South Africa launched a program to prevent vertical transmission of HIV. Although these services are available free of charge to pregnant women in the public health sector of South Africa, some HIV-positive women do not use these services. Some babies test HIV-positive at the age of six weeks even if their mothers had used vertical prevention of HIV services. These observations could indicate that this program might not meet its aims. South Africa's NDOH [5] identified the following aspects that could influence the outcomes of this program:

- Stigma attached to being HIV-positive
- Problems encountered to disclose one's HIV-positive status
- Procedures followed during the baby's birth
- Sexual practices during pregnancy and while breastfeeding
- The general well-being of the HIV-positive women before, during and after pregnancy
- The selected infant feeding option.

The purpose of the current study was to identify factors that might impact on women's utilization and on the outcomes of the programme to prevent vertical transmission of HIV in one area in South Africa, so that appropriate recommendations could be made to enhance the outcomes of these programs in future. The significance of implementing such recommendations would be that more HIV-positive women could receive adequate care during and after their pregnancies thereby enhancing their general well-being, and decreasing their babies' risk of being HIV-positive by the age of six weeks.

The objectives of this study aimed to identify whether the following factors impacted on HIV-positive women's utilization of vertical prevention of HIV services and/or on the outcomes of these services: stigma, disclosure of HIV-positive status, procedures followed during the baby's birth, sexual practices during pregnancy and breastfeeding, the woman's general well-being before during and after pregnancy, and selected infant feeding options.

2. MATERIALS AND METHODS

A non-experimental, quantitative and descriptive study was conducted to identify factors impacting on HIV-positive women's utilization services to prevent vertical transmission of HIV and on the outcomes of these services in one area of South Africa. The study's population comprised all women who utilized these services in the study area during 2010 and 2011, were willing to consent to respond to questionnaire items and for data to be transcribed anonymously from their prenatal clinic records and assent to the utilisation of information from their babies' charts. An HIV-positive woman could thus only participate in this study if her prenatal record was available as well as her baby's clinic chart, if a questionnaire could be administered on the day when she visited a specific well-baby clinic and if she attended prenatal clinics in the study area. All women who met the inclusive criteria were

invited to participate in the study, but most women refused. By 30 September 2011, when 200 (N=200) conveniently selected women's questionnaires had been completed, data analysis commenced.

No woman was coerced to participate and no adverse consequences were incurred by refusal to do so. All respondents were informed that they could refuse to answer specific questions and they could terminate their participation at any stage. They were assured that all data would be treated anonymously as no names would be used in any research report. Signed consent forms were sealed in individual envelopes and placed in a specific container. Ten trained research assistants asked the same questions in the same order and recorded the respondents' answers on the questionnaires. Completed questionnaires were sealed in individual envelopes and placed into a separate container. In this way no signed consent form could be linked to any specific completed questionnaire. The research assistants signed confidentiality agreements with the first author. No risks were involved as research assistants asked questions and recorded answers on questionnaires. The first author, a senior professional nurse, was always available in case any respondents might have required assistance, but this was never necessary.

A questionnaire was compiled, based on the reviewed literature and on the NDOH's guidelines for providing services to prevent vertical transmission of HIV. Closed-ended questions requested information about the woman's personal characteristics, her general well-being during pregnancy, obstetric history, disclosing her HIV-positive status, sexual practices, and the selected infant feeding option. Responses to a few open-ended questions were grouped and analysed quantitatively. After completion of every questionnaire, the research assistant had to enter information from the woman's and from the baby's charts (on to a checklist attached to the completed questionnaire). Such information from the mothers' charts included the trimester of pregnancy when prenatal visits commenced, the total number of prenatal clinic visits, weight gain/loss, haemoglobin level, infections/illnesses treated during and after pregnancy, medicines and supplements provided during pregnancy, CD4 count, and the administration of cotrimoxazole. Information recorded from the babies' charts included the baby's weight, HIV status, ARVs administered and immunisation status.

The questionnaire was compiled in English, translated into isiZulu by the first author, and checked by a bilingual expert for accuracy. The women's responses to the open-ended questions were recorded verbatim, translated by the first author and authenticated by the bilingual expert. The research assistants asked the questions in English or isiZulu, depending on each woman's preference. All research assistants were bilingual in English and isiZulu, received training about obtaining informed consent, and about completing the questionnaires and checklists.

The research assistants administered questionnaires to 10 women who met the inclusive criteria to pre-test the instrument. A few words had to be explained in simpler terms and problems were encountered to transcribe information from the patients' charts to the checklists as the information in the patients' charts was frequently incomplete. These 10 completed questionnaires did not form part of the 200 that were analysed for the current study.

The study's supervisors and statistician agreed that every item was directly relevant for identifying factors that might influence women's utilization of services preventing vertical transmission of HIV or the outcomes of these services. Thereafter five nurses providing these prevention services in the Govan Mbeki area confirmed that every item was relevant to the purpose of the study. The experts who approved the face validity also graded each item on a 5-point Likert scale, with 1 indicating no relevance to the research phenomenon and 5 indicating complete relevance. Only items with validity content index scores of 4 and higher were included in the instrument. The NDOH's national guidelines for vertical prevention of HIV services were used as criteria to determine the criterion-related validity of specific items in the questionnaire and checklist.

All consulted experts agreed unanimously that all items included in the questionnaire and checklist were relevant to factors that might influence women's utilization of these services or the outcomes of these services in the study area.

A statistician analysed the data using the MSExcel 2010 and the Statistical Package for the Social Sciences version 20 programs.

The Higher Degrees Committee of the Department of Health Studies at the University of South Africa approved the research protocol and instrument. The provincial and district health authorities granted permission for the study to be conducted. The manager of every participating clinic also granted permission and arranged suitable times and private rooms for the completion of the questionnaires. The research assistants ensured that every respondent did not lose her place in a clinic queue due to participating in the study.

3. RESULTS AND DISCUSSION

Out of the 200 respondents, 55.5% ($f=111$) were 20-29 years old while 10.5% ($f=21$) were teenagers up to the age of 19. As many as 14.5% ($f=29$) of the respondents did not progress beyond seven years of schooling. Only 22.0% ($f=44$) of the women were employed. Half of the 44 employed women (50.0%; $f=22$) earned a monthly wage of less than R1 000.00 (approximately USD66.67) thus even the employed women were financially dependent on other people. All respondents tested HIV-positive and used services to prevent vertical transmission of HIV.

Most respondents (75.5%; $f=151$) thought that society discriminated against HIV-positive persons, attributed to society's lack of HIV-related knowledge (52.3%; $f=79$) and to people's ignorance that anybody could become HIV-positive (15.2%; $f=23$) while 4.6% ($f=7$) believed people hated HIV-positive persons. According to Le Roux and Kemp [7], societies tend to isolate HIV-positive persons due to the social stigma of HIV as a disease without a cure. Such social isolation might lead to self-stigmatisation, impacting negatively on a person's ability to disclose his/her HIV-positive status. Njunga and Blystad [8] maintained that social stigmatisation contributed to non-disclosure of persons' HIV-positive status.

As many as 88.0% ($f=176$) of the respondents had disclosed their HIV-positive status to others, ranging from one to five other persons. Although some of the respondents (65.3%; $f=115$) had disclosed their HIV-positive status to others soon after being informed that they were HIV-positive, others took up to a year before doing so and 12.0% ($f=24$) had never done so. These 24 respondents considered people to be untrustworthy with 'delicate information' (37.5%; $f=9$), gossiping about HIV-positive people (33.3%; $f=8$), or discriminating against HIV-positive persons (29.2%; $f=7$). Of the respondents, 43.8% ($f=77$) disclosed their HIV-positive status first to their parents while most (70.5%; $f=124$) did so to their partners.

All 200 babies were born in health care facilities. Of the women, 17.0% ($f=34$) reported that episiotomies were performed during their babies' births, although this is contrary to the NDOH's [9] guidelines. Most babies (79.0%; $f=158$) were born by normal vaginal deliveries while 9.5% ($f=19$) were born through caesarean sections and 1.5% ($f=3$) through forceps deliveries. As many as 50.5% ($f=101$) of the respondents reported rupture of membranes prior to the onset of labour, increasing the risk for HIV transmission to the baby.

Reportedly 75.0% ($f=150$) of the respondents had sexual relations during their pregnancies but only 23.0% ($f=46$) used condoms at every sexual encounter throughout their pregnancies. After their babies' births, 39.0% ($f=78$) of the respondents used condoms at every sexual encounter. Inconsistent condom use exposed these women's babies to the risk of HIV transmission during pregnancy and breastfeeding.

Late commencement of prenatal clinic visits might impact negatively on the outcomes of the program to prevent vertical transmission of HIV failing to ensure a healthy mother and an HIV-negative baby [5]. In the current study, only 9.5% ($f=19$) of the 200 women, commenced prenatal clinic visits during the first trimester of pregnancy, while 65.5% ($f=131$) did so during the second trimester and 25.0% ($f=50$) during the last trimester. Longer periods of using ARVs before the baby's birth enhance the chances that the mother's viral load would be sufficiently depressed during birth, reducing the likelihood of HIV transmission. Low maternal plasma viral load is the key factor for preventing vertical transmission of HIV [10]. As only 9.5% of the current study's respondents commenced prenatal clinic visits during the first trimester of pregnancy, 90.5% might have used insufficient ARVs to reduce the risk of vertical transmission of HIV.

Any infection could decrease a pregnant woman's CD4 count, increase her VL and increase the risk of HIV transmission. The following aspects, recorded on the completed questionnaires and from the respondents' prenatal records, indicate that some women's wellbeing might have been compromised during pregnancy by not receiving the correct treatment as specified in the NDOH [11] guidelines:

- 81.5% ($f=163$) of the respondents' CD4 counts were 599mm and lower; although 52 of these women should have received cotrimoxazole prophylaxis to prevent opportunistic infections [3], only nine (17.3%) had received this treatment
- 50.5% ($f=101$) of the women experienced abnormal vaginal discharges 1-5 times during their pregnancies, but only 28.7% ($f=29$) had treatments recorded in their patient files and only 3.9% ($f=4$) had received the correct treatment
- 48.5% ($f=97$) suffered from different degrees of anaemia, yet only some patients had received free folic acid (46%; $f=92$) and free ferrous sulphate (51%; $f=102$)
- 38.5% ($f=77$) had suffered from urinary tract infections 1-5 times during their last pregnancies, but only 14.3% ($f=11$) of these 77 women had been treated with amoxicillin
- of the respondents, 19.5% ($f=39$) had mild and 6.5% ($f=13$) had severe hypertension with a systolic blood pressure above 160 and a diastolic blood pressure above 110; implying that 26% ($f=52$) of the respondents had increased life-threatening risks for premature labour, eclampsia and postpartum haemorrhage [12]
- 11.5% ($f=23$) of the women lost weight and 9.0% ($f=18$) gained no weight during their pregnancies but no interventions were recorded.

South Africa's NDOH [5] advises that HIV-positive women should exclusively breastfeed their babies for six months, commence adding solid foods when the babies are six months old and continue breastfeeding until the babies are 12 months old. Out of the current study's 200 HIV-positive women, only 15.5% ($f=31$) opted for exclusive breastfeeding and only 6.5% ($f=13$) intended breastfeeding their babies until they were 12 months old. Thus the minority of the current study's respondents adhered to the NDOH [5, 10] guidelines. Out of 200 mothers, 18.5% ($f=39$) gave solid foods to their babies before they reached the age of six months. Avert [13] warned that if solid foods are given too early, excoriation of the infant's immature gut could occur, causing microscopic holes through which HIV could enter the infant's system. This could cause an infant born HIV-negative, despite having an HIV-positive mother, to become HIV-positive because of incorrect infant feeding methods.

The other mothers selected the following infant feeding options:

- Formula only (36.5%; $f=73$)
- Formula and solid foods (28.5%; $f=57$)
- Breast milk, formula and solid foods (12.0%; $f=24$)
- Breast milk and solid foods (7.5%; $f=15$)

Although most respondents opted for formula feeding, no demonstrations were provided at the prenatal clinics about the preparation of infant formula feeds. Reportedly 12.0% of the mothers did not receive any health education about infant feeding and 16.0% ($f=32$) were told not to breastfeed their babies as they would transmit HIV to their infants through breast milk.

Eighteen (9.0%) out of the 200 babies were HIV-positive by the time they were six weeks old, based on PCR test results.

4. CONCLUSIONS

Most respondents (75.5%; $f=151$) felt that HIV-positive persons were stigmatised by their communities. However, 88% ($f=176$) of the respondents had disclosed their HIV-positive status to at least one person although some took longer than one year to do so and 12% ($f=24$) never did so. Thus health education efforts should address the issues of stigma and disclosure.

Not all NDOH guidelines were followed during the babies' births. All babies were born in health care facilities; 17% ($f=34$) of the women had episiotomies and 50.5% ($f=101$) reported that the membranes had ruptured prior to the onset of labour. The NDOH [11] advises against episiotomies to reduce the risk of vertical transmission of HIV and also indicates that ruptured membranes prior to the onset of labour increase this risk. Clear guidelines should specify the use of episiotomies and the procedures to be followed in cases where HIV-positive women's membranes rupture prior to the onset of labour.

HIV-positive women did not use condoms effectively during pregnancy and breastfeeding. Only 23% ($f=46$) of the respondents used condoms regularly during pregnancy and 38% ($f=76$) did so after their babies' births. Unless HIV-positive women use condoms effectively at every sexual encounter, the outcomes of any program to prevent vertical transmission of HIV could be nullified as the babies could become infected with HIV during pregnancy, birth or breastfeeding.

The HIV-positive pregnant women's wellbeing might have been compromised by commencing ANC clinic visits late during pregnancy. Not all eligible women received cotrimoxazole to reduce the risk of opportunistic infections, or treatment for urinary tract infections, anaemia, hypertension or weight loss or failure to gain weight during pregnancy at the ANC clinics.

The NDOH's infant feeding guidelines were observed by few respondents as 15.5% ($f=31$) practised exclusive breastfeeding (EBF) and 6.5% ($f=13$) intended doing so till their babies reached the age of 12 months. Health care providers should emphasise the necessity of EBF for six months, introducing solid foods at the age of six months but continuing with breastfeeding till the baby is 12 months old. Mothers attending well-baby clinics should be questioned about and educated about the recommended infant feeding methods.

Although the current study's 9.0% ($f=18$) HIV-positive babies is higher than the recommended 5.0% specified by the WHO, this study's findings pertain to a convenience sample. However, the outcomes of the South African program to prevent vertical transmission of HIV could be improved if stigmatization could be reduced and disclosure of women's HIV-positive status enhanced, the recommended procedures during babies' births are followed, HIV-positive women use condoms effectively throughout pregnancy and breastfeeding periods, HIV-positive women receive appropriate health care at ANC clinics, and adhere to the recommended infant feeding methods. The time, effort and money spent on the program to prevent vertical transmission of HIV could be useless unless the HIV-positive women use condoms consistently while pregnant and breastfeeding and adhere strictly to the national infant feeding guidelines.

ACKNOWLEDGEMENTS

This article is based on research conducted for the second author's Doctoral thesis at the University of South Africa. The health care authorities, the research assistants and the participating women, are thanked for their contributions towards the completion of this study.

FOOTNOTES

The authors have no conflict of interest. No funding/support was received to conduct this study.

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