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Assessing the Uptake of Services for Preventing Mother-to-child Transmission of HIV in Benin City, Edo State, Nigeria

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Authors' contributions

Both authors were fully involved in the study. Author TA wrote the protocol, performed data analysis and wrote the first draft of the manuscript. Author ANO reviewed the study protocol and results of the data analysis. Both authors read and approved the final manuscript.

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ABSTRACT

Introduction: Mother-to-child transmission of HIV remains a leading cause of morbidity and mortality in children below five years of age in Nigeria.
Aim: The aim of this study was to assess the uptake of services for preventing mother-to-child transmission (PMTCT) of HIV in Benin City.
Methods: A review of the National PMTCT registers was conducted across seven health facilities in Benin City that provide comprehensive services for preventing mother-to-child transmission of HIV. The period of review was from 1st January, 2010-31st December, 2010. A data form was used to collect data on the National PMTCT service indicators from the different registers at the sites.
Results: 13, 907 pregnant women registered for antenatal care across the seven sites during the period reviewed. Of these, the proportion of pregnant women counselled for HIV was 89.1%, the

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proportion of pregnant women who accepted HIV testing was 87.9% and the proportion of women, counselled, tested and who received results was 87.2%.
569 of the new antenatal care attendees (4.66%) tested positive for HIV. Of these, 520 (91.4%) received antiretroviral prophylaxis to prevent mother-to-child transmission of HIV. Three hundred and seventy-six babies were delivered by HIV positive women across the sites during the period reviewed. Of these, 367 (97.6%) were delivered alive and 339 (92.4%) received Nevirapine prophylaxis. Four of the seven sites had records of HIV testing for HIV-exposed infants. The records from these sites indicated 672 HIV-exposed infants were tested for HIV of which 46 (6.84%) tested positive for HIV using DNA polymerase chain reaction.
Conclusion: The uptake of most PMTCT services across the seven PMTCT sites in Benin City was above 80.0%. The uptake of partner counselling among partners of HIV positive women in this study was 15.1%. The rate of mother-to-child transmission of HIV in this study was 6.84%.

Keywords: PMTCT; programme; HIV; evaluation; Nigeria.

1. INTRODUCTION

Mother-to-child transmission of HIV (MTCT) remains a major challenge to the health and well-being of children in Africa. It contributes to severe morbidity and mortality in children below the age of five years threatening the achievement of the millennium development goals [1]. Mother-to-child transmission of HIV refers to the transmission of HIV from an infected mother to her infant during pregnancy, labour or through breastfeeding [2]. The risk factors for mother-to-child transmission of HIV include high maternal viral load, low CD4 count, advanced HIV disease, prolonged labour, instrumental delivery and mixed feeding [2,3]. The rate of mother-to-child transmission of HIV is between 25%-40%, however this can be reduced to less than 5% with the use of appropriate interventions [4-6]. Prevention of mother-to-child transmission of HIV (PMTCT) refers to programmes and interventions designed to reduce the risk of mother-to-child transmission of HIV.

The national programme for preventing mother-to-child transmission of HIV was instituted in the year 2002 with the aim of reducing mother-to-child transmission of HIV by 50% by the year 2010 [6]. Several studies have evaluated the performance of the PMTCT programme at different health facilities in Nigeria [7-10]. These studies reported unacceptably high rates of mother-to-child transmission of HIV of between 33% and 68% [7-9]. The availability of complete and accurate data remains crucial for monitoring and evaluating the performance of PMTCT programmes. Poor data quality however has been reported as a major challenge to the evaluation of PMTCT programmes in several countries [11-15].

The objective of this study was to assess the uptake of PMTCT services in health facilities providing comprehensive services for preventing mother-to-child transmission of HIV. These services include HIV counselling and testing (HCT), antenatal care, delivery care, post natal care, early infant diagnosis of HIV, etc. Assessing the uptake of PMTCT services would help to ascertain the level of implementation of the PMTCT programme in Benin City, Edo State, Nigeria.

2. MATERIALS AND METHODS

This study was conducted in Benin City, the capital of Edo State with a population of 1, 085, 676 [16]. Seven health facilities in Benin City provide comprehensive services for PMTCT including HIV counselling and testing, family planning, antenatal care, delivery care, post natal care and early infant diagnosis [17]. Together, these seven health facilities record over 8,000 deliveries and 72,000 ANC consultations in a year. In order to protect the identities of the health facilities, each facility was represented with a health facility code from 001-007.

2.1 Study Population

This comprised the seven health facilities providing comprehensive services for preventing mother-to-child transmission (PMTCT) of HIV in Benin City.

2.2 Inclusion Criteria

The seven government-approved health facilities providing comprehensive PMTCT services in Benin City were included in this study.

2.3 Exclusion Criteria

Non-approved government health facilities were excluded from the study. Similarly, health facilities not providing comprehensive services for preventing mother-to-child transmission of HIV were excluded.

2.4 Study Design

The study design was a descriptive cross-sectional survey.

2.5 Sampling Technique

A total population survey of the seven health facilities providing comprehensive PMTCT services in Benin City was carried out.

2.6 Method of Data Collection

A review of the National PMTCT Registers was conducted for the period 1st January, 2010 to 31st December, 2010. Data was collected on the PMTCT service output indicators. The registers reviewed during the course of the study were: the General Antenatal Clinic (ANC) Register, ANC HIV Counselling & Testing Register, ANC monthly summary form, PMTCT Delivery Register, Child follow-up register, Maternal Follow-up register and Partner register. Data obtained from these registers was used to assess the uptake of PMTCT services at the different health facilities providing comprehensive services for PMTCT of HIV (i.e. PMTCT sites). Missed opportunities for preventing mother-to-child transmission of HIV were also identified across the sites. Data was collected on several indicators including number of new antenatal clinic (ANC) attendees, number of new ANC clients receiving pre-test counseling, number of ANC clients who accepted HIV testing, HIV sero-prevalence among women tested for HIV at ANC, number of women who were counselled, tested for HIV and received HIV result. Data was also collected on other indicators including the number of HIV positive pregnant women counselled on infant feeding options, number of HIV positive women who delivered in reporting hospitals, proportion of HIV exposed children who received Nevirapine prophylaxis for PMTCT and the number of HIV-exposed babies tested for HIV. The data form was used to review the National PMTCT registers and information was collected on the PMTCT service output indicators at each site.

2.7 Data Analysis

Data collected on the National PMTCT Service indicators was expressed as frequencies and percentages. This was used to assess the uptake of PMTCT services across the sites and compute the drop-out rates for the PMTCT programme during the period reviewed. The drop-out rate was the proportion of women who withdrew from the PMTCT programme before reaching the point of intervention at which mother and baby received antiretroviral medication to prevent mother-to-child transmission of HIV.

3. RESULTS

A total of 13, 907 pregnant women registered newly for antenatal care across the seven PMTCT sites in Benin City between 1st January, 2010 and 31st December, 2010. Of this number, a total of 12, 395 pregnant women received pre-test counselling for HIV (89.1%) out of which 12, 217 (87.9%) accepted HIV testing. A total of 12, 206 (87.8%) pregnant women were counselled, tested and received their HIV test results across the sites, giving a drop-out rate of 12.2% among new ANC attendees across the sites.

Five hundred and sixty-nine of the new ANC attendees tested positive for HIV giving a HIV sero-prevalence rate of 4.66% among the new ANC attendees. Among the 569 pregnant women who tested positive for HIV during this period, 565 (99.3%) were counselled on infant feeding options, 520 (91.4%) were counselled on family planning and 500 (87.9%) agreed to partner notification.

A total of 520 pregnant women who tested positive for HIV at ANC received ARV prophylaxis for PMTCT (91.4%). Ninety-six HIV positive women received single regimen ARV prophylaxis for PMTCT (18.5%). Thirty-seven HIV positive women received double regimen ARV prophylaxis for PMTCT (7.1%) while 387 HIV positive women received triple regimen ARV prophylaxis for PMTCT (74.4%).

Eighty-six partners (15.1%) of HIV positive pregnant women received pre-test counselling for HIV screening across the sites during the period reviewed; giving a drop-out rate of 84.9% among the partners of HIV positive pregnant women tested. Twenty-four of the partners tested (27.91%) had sero-discordant HIV test results.

A total of 8835 deliveries were recorded across the seven sites between 1st January 2010 and 31st December 2010. During the same period, 371 deliveries were recorded among HIV positive women across the sites. One hundred and fifty-seven HIV positive women (42.3%) received ARV prophylaxis while in labour. Of this number, 150 HIV positive women received single dose Nevirapine in labour (95.5%) while seven (4.5%) received HAART in labour.

A total of 376 children were delivered by HIV positive women across the sites during the period reviewed. Of this number, 367 children (97.6%) were delivered alive. Three hundred and thirty-nine of the infants delivered alive (92.4%) received Nevirapine prophylaxis for PMTCT of HIV. Records on the number of HIV-exposed infants tested for HIV was available in four of the seven health facilities. Available records indicate that a total of 672 HIV-exposed infants were tested for HIV across the four sites during the period reviewed.

Six hundred and sixty-two (98.5%) HIV-exposed infants were tested for HIV using DNA PCR from the age of six weeks while ten infants (1.5%) had rapid test for HIV done at 18 months of age. A total of 46 HIV-exposed infants tested positive for HIV with DNA PCR during the period reviewed. Six hundred and sixteen HIV-exposed infants tested for HIV with DNA PCR (93.1%) had a negative HIV status after six weeks of life. None of the ten infants tested with rapid HIV test kits at 18 months had positive HIV tests results. The rate of mother-to-child transmission of HIV in this study was 6.84% based on the total of 46 children who tested positive for HIV out of a total of 672 HIV-exposed children. The uptake of PMTCT services across the sites is depicted in Table 1.

Table 1. Uptake of PMTCT services and drop-out rate from the programme

PMTCT service output indicators	Total No between Jan-Dec 2010	Uptake i.e. proportion of target population who received the PMTCT service	Drop out rate
No. of new ANC attendees	13,904	-	-
No. of ANC clients receiving pre-test counselling information	12, 395	89.1%	10.9%
No. of ANC clients who accepted HIV testing	12, 217	87.9%	12.1%
No. of ANC clients counselled, tested and who received HIV results	12,206	87.8%	12.2%
*No. of ANC clients who tested positive for HIV at ANC	569	N/A	N/A
No of HIV positive mothers counselled on infant feeding options	565	99.3%	0.7%
No. of HIV positive women counselled on family planning	520	91.4%	8.6%
No. of women who agreed to partner notification	500	87.8%	12.2%
No. of partners of HIV positive women who received pre-test counselling information	86	15.1%	84.9%
No. of partners of HIV positive women pre-test counselled who accepted HIV test	86	100.0%	0.0%
No. of pre-test counselled partners who were counselled, tested and who received results	86	100.0%	0.0%
No of HIV positive pregnant women whose partners had sero-discordant results	24	N/A	N/A
No. of women delivering at reporting facilities who were HIV positive	371	N/A	N/A
Total No. of deliveries recorded during the twelve month period	8835	-	-

N/A: Not Applicable, HIV sero-prevalence rate among the new ANC attendees = 4.66%
Sero-Discordant rate among partners of HIV positive pregnant women who were HIV tested. = 27.9%
Proportion of deliveries by HIV positive pregnant women across the sites = 4.2%

Table 2. Uptake of PMTCT services and drop-out rate from the programme continued

PMTCT service indicator	Total No between Jan-Dec 2010	Uptake i.e. proportion of target population who received the PMTCT service	Drop out rate
Total No. of HIV positive pregnant women who received ARV prophylaxis for PMTCT	520	91.4%	8.6%
Proportion of HIV positive pregnant women who received single regimen ARV prophylaxis for PMTCT	96	18.5%	-
Proportion of HIV positive pregnant women who received double regimen ARV prophylaxis for PMTCT	37	7.1%	-
Proportion of HIV positive pregnant women who received triple regimen ARV prophylaxis for PMTCT	387	74.4%	-
No. of HIV positive women delivering at reporting facilities	371		
Proportion of HIV positive women who received ARV prophylaxis in labour	157	42.3%	57.7%
No. of HIV positive women who received single-dose Nevirapine in labour	150	95.5%	-
No. of HIV positive women who received HAART in labour	7	4.5%	-
No. of HIV-exposed children delivered	376		
Proportion of HIV exposed children delivered alive	367	97.6%	2.4%
Proportion of HIV exposed children who received Nevirapine prophylaxis for PMTCT	339	92.4%	7.6%
No. of HIV-exposed babies tested for HIV	672	-	-
Proportion of HIV-exposed babies tested for HIV from six weeks with DNA PCR	662	98.5%	-
Proportion of HIV-exposed babies tested for HIV with rapid HIV tests at 18 months	10	1.5%	-
Proportion of HIV-exposed babies with positive status after six weeks (DNA PCR)	46	6.9%	-
Proportion of HIV-exposed babies with negative HIV status after six weeks of life (DNA PCR)	616	93.1%	-
Proportion of HIV-exposed babies who tested positive at 18 months of age	0	0.0%	-
Proportion of HIV-exposed babies with HIV negative status at 18 months of age (rapid HIV test)	10	100.0%	-

4. DISCUSSION

The HIV sero-prevalence rate of 4.66% among new ANC attendees in this study is very similar to national HIV sero-prevalence rate of 4.6% among pregnant women attending ANC in Nigeria. It is however slightly lower than the HIV sero-prevalence rate of 5.2% reported among pregnant women attending ANC in Edo State [18]. There were missed opportunities for preventing mother-to-child transmission of HIV at every stage of the programme in this study. This was evidenced by the drop-out rates observed at different points of the programme.

The uptake of partner counselling among partners of HIV positive women in this study was particularly low at 15.1% with a drop-out rate of 84.9% among partners of HIV positive women. The unwillingness of HIV positive mothers to disclose their HIV status to their spouses may contribute to the low rate of partner testing observed in this study. This may be borne out of a fear of rejection and stigmatisation by their partners following the disclosure of their HIV status to their spouses. Furthermore, culturally very few men in Benin City accompany their wives for antenatal clinic visits. This reduces the opportunities available to screen the male partners for HIV. The low rate of partner testing observed across the sites suggests inadequate male involvement in the PMTCT programme. It suggests the need for innovative measures to increase male participation in the programme.

In one site, health workers adopted a unique approach to improving male involvement in the programme. Pregnant women were given a "love letter" inviting their male partners or spouses to the antenatal clinic for HIV testing. Such an approach may improve the uptake of HIV testing among the spouses or partners of women attending antenatal clinic. However, fear of a positive HIV test result may limit the uptake of HIV testing among the male partners of women attending antenatal care.

Deliveries by HIV positive women accounted for a small proportion of the total number of deliveries recorded across the sites (371 out of 8835 deliveries). The relatively small proportion of deliveries by HIV positive women across the sites suggests that the health facilities require few additional resources to cater for HIV positive women delivering at the sites. It also suggests that most health facilities can sufficiently cater for the needs of HIV positive mothers and their infants with the resources available at the sites in terms of money, materials and manpower. This information is useful for policy makers and heads of health facilities allocating resources for maternal and child health services including the PMTCT programme which cuts across most departments within the health facilities. Full integration of the PMTCT programme with existing maternal and child health services will ensure its sustainability by pooling resources available for existing programmes aimed at promoting maternal and child health.

Majority of the HIV-exposed infants delivered alive across the sites, 339 (92.3%) received Nevirapine prophylaxis for PMTCT of HIV indicating good uptake of antiretroviral prophylaxis among infants born to HIV positive mothers. The drop-out rate of 7.7% indicates missed opportunities for PMTCT of HIV. It may also be due to incomplete documentation of the number of HIV-exposed infants who received Nevirapine prophylaxis. Inaccurate data hinders the evaluation of PMTCT programmes and reduces the capacity to implement needed changes to improve them. Review of records across the sites indicate that 672 HIV-exposed infants had early infant diagnosis of HIV with DNA PCR at the age of six weeks or rapid HIV tests at 18 months of age. Forty-six infants (6.8%) out of the total of 672 HIV-exposed babies tested positive for HIV. In contrast, 367 HIV-exposed infants were delivered across the seven PMTCT sites.

A major limitation of this study is the fact that the number of children who had early infant diagnosis far exceeded the number of HIV-exposed infants delivered at the seven health facilities. This may be explained by the fact that two of the seven sites were referral sites that conduct early infant diagnosis on behalf of several smaller health facilities across the state. A significant number of the babies tested at these sites may have been delivered at health facilities where their mothers may not have had access to services for preventing mother-to-child transmission of HIV. Ensuring universal access to services for preventing mother-to-child transmission of HIV in Benin City, Edo State will greatly reduce the observed rate of mother-to-child transmission of HIV.

A closer look at the data within each health facility, revealed some interesting findings. At Health facility 007, 5 HIV-exposed infants delivered alive at this site, however, there was no data on the number of HIV-exposed infants tested for HIV. At health facility 004, the national PMTCT registers were unavailable; however, the health workers at the site made use of improvised registers for data capture. The records at this site indicated that six HIV-exposed infants were delivered at this site. However, there was no record of the number of HIV-exposed infant tested at the site.

At health facility 003, the national PMTCT registers were available and well kept. The records indicated 11 HIV-exposed infants were delivered at this site. However, there was no data on the number of HIV-exposed infants tested for HIV. At health facility 005, all the national PMTCT registers were in use and were well kept. The records indicate that a total of 28 HIV-exposed babies were delivered alive at the site. The records indicated that 17 HIV-exposed infants were tested for HIV with DNA PCR at the site. None of the 17 HIV-exposed babies tested positive for HIV.

At health facility 006, the national PMTCT registers were available and well kept. The records indicated that 38 HIV-exposed children were delivered at the site. Of this number, one HIV-exposed infant tested positive for HIV with DNA PCR. At health facility 002, some of the national PMTCT registers were observed to be torn and poorly kept. The records indicated that 114 HIV-exposed infants were delivered at this site. Of this number, 24 babies tested positive for HIV with DNA PCR.

Lastly, at health facility 001, most of the national PMTCT registers were available, in use and well kept. However, a ruled notebook was used to improvise for the child follow-up register at this site. The notebook was observed to be poorly kept and had some torn pages. Though a brand new child follow-up register was available at this site, it was not in use as at the time of the study. The records indicated that 165 HIV-exposed infants were delivered at the site. Of this number, 21 tested positive for HIV with DNA PCR.

Torn registers and incomplete PMTCT programme data hindered the evaluation of the performance of the PMTCT programme in this study. The National PMTCT Registers were not available at all the sites studies. However, at sites where the National PMTCT registers were unavailable, the health facilities made use of improvised PMTCT registers comprising ruled notebooks for data capture. Similar challenges affecting the evaluation of PMTCT programmes have been reported elsewhere [11,13,15]. Training and re-training of health workers involved in the collection of routine PMTCT programme data and the use of appropriate data collection instruments such as the national PMTCT Registers are essential for adequate programme monitoring and evaluation.

5. CONCLUSION

The uptake of most services for preventing mother-to-child transmission of HIV was very good across sites studied. This includes the proportion of pregnant women counselled for HIV at ANC (89.1%), the proportion of pregnant women who accepted HIV testing (87.9%) and the proportion of women, counselled, tested and who received results (87.2%). The HIV sero-prevalence rate among the new ANC attendees was 4.66%. The uptake of partner counselling among partners of HIV positive women was particularly low at 15.1% across the sites. The overall rate of mother-to-child transmission of HIV in this study was 6.84%.

CONSENT

This study was based on data on the national PMTCT service indicators obtained from a review of the National PMTCT registers across the sites studied. Data collected from the registers was fully anonymised, no patient identifying information was collected. Informed consent from individual patients was therefore not applicable in this study.

However, permission to access the data was obtained from the head of each health facility where the study was conducted.

ETHICAL APPROVAL

Approval for this study was obtained from the Ethical Committee of the University of Benin Teaching Hospital. Similarly, ethical approval and permission to use health facilities belonging to the Edo State Government was obtained from the Ethical Clearance Committee of the Edo State Ministry of Health. A summary of the research proposal was submitted to the head of each health facility for ethical consideration and to the ethical committees of the health facilities where applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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