Service uptake and performance of the prevention of mother-to-child transmission (PMTCT) programme in Ibadan, Nigeria

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Summary

The Prevention of Mother to Child Transmission (PMTCT) programme in the University College Hospital (UCH), Ibadan has been in existence for more than five years and has scaled up to other sites. The study evaluated the service uptake and performance of the programme using national key indicators. Antenatal and delivery records of women enrolled between July 2002 and June 2007 were reviewed. A total of 51952 women attended first antenatal visits and received HIV pre-test counselling. Of these, 51614 (99.5%) accepted HIV test and 49134 (95.2%) returned for their results. Out of the tested patients, 2152 (4.2%) were identified to be HIV positive. Partners of positive patients accepting HIV testing were 361(16.7%) with 87 (18.6%) testing positive. There were a total of 942 deliveries out of which 39.2% of the mothers and 95.2% of the babies respectively received ARV prophylaxis. In all, 85.8% (788/918) of the mothers opted for formula as the method of infant feeding. Out of the 303 babies eligible for ELISA testing, 68.3% reported for the test and 17(8.7%) tested positive. There has been progress in the programme, reflected in the increase in the number of new clients accessing the PMTCT service. However, partner testing and follow up of mother-infant pairs remain formidable challenges that deserve special attention.

Keywords: *PMTCT indicators; uptake; partner testing; caesarean section; infant testing; transmission rate; Nigeria*

Résumé

Le programme de prévention de la transmission de la mère a l'enfant au collège hospitalier universitaire (UCH), Ibadan existe depuis plus de 5 ans et s'est étendu dans d'autres sites. L'étude a évalué les services rendus et la performance du programme en utilisant les indicateurs nationaux clés. Les registres de soins prénatales et d'accouchements des femmes enregistrées entre juillet 2002 et juin 2007 étaient revus. Un total de 51952 femmes ont atteints la première visite prénatale et ont reçues des conseils concernant le VIH. De ceux-ci, 51614 (99.5%) ont accepte le test et 49134 (95.2%) ont pris leurs résultats. Des patients testes, 2152 (4.2%) étaient identifies séropositifs. Les partenaires des patients séropositifs qui ont acceptés le test étaient 361 (16.7%) avec 87(18.6%) testes positifs. Il y'avait un total de 942 accouchements, desquels 39.2% des mères et 95.2% des bébés ont reçus l'ARV prophylaxique. En tout, 85,8% (788/918) des mères optèrent pour l'allaitement artificiel. Des 303 bébés éligible aux tests ELISA, 68.3%, reportes pour le test et 17 (8,7%) étaient testes positifs. Il y'a eu des progrès dans le programme, marqué par l'augmentation du nombre de nouveau clients optant pour les services PMTCT. Les tests des partenaires et le suivi de la mère et de l'enfant restent un défi qui mérite des soins particuliers.

Introduction

In 2007, it was estimated that 2.1 million children less than 15 years old were living with the human immunodeficiency virus (HIV).Four hundred and twenty thousand(420,000), children were newly infected while 290,000 children died of AIDS [1]. Mother to child transmission accounts for 90% of these infections in children, and in the absence of interventions to prevent transmission, about 15-25% of infants of HIV-infected women will be infected during pregnancy and delivery, and an additional 5-20% may become infected during breastfeeding [2]. The 2005 HIV sentinel survey among women aged 15 – 49 years attending ante natal clinics in Nigeria revealed a prevalence rate of 4.4% indicating that about 2.9 million people might be infected with the

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virus [3]. For women to benefit maximally from Prevention of Mother to Child Transmission (PMTCT) interventions, they need to access antenatal, delivery, and postnatal care services which include antenatal HIV counselling and testing, antiretroviral prophylaxis and optimal obstetric practices that reduce the risk of transmission, counselling on infant feeding and support of mothers' infant feeding choices. These services have improved over the years to include care and treatment for the HIV infected women for her own health

Since the 90s, the efficacy of various antiretroviral regimens for the prevention of mother-to-child transmission (MTCT) has been demonstrated [4]. Connor *et al* [5] had been able to show in the mid 90s that mother to child transmission of HIV could be reduced by more than 60% by administering Zidovudine (SDP) in pregnancy, labour and postpartum among non-breastfeeding women in the USA and Europe. Highly Active Antiretroviral Therapy (HAART) in pregnancy has been reported to reduce mother-to-child transmission of HIV to less than 2% and had been implemented in more developed countries [6]. The HIVNET012 trial in Uganda with a regimen of a single dose Nevirapine (NVP) to mothers at the time of labour and to infants within 72 hours of birth was compared to ZDV during labour and for 7 days to infants, in a breastfeeding population. At 6-8 weeks, the rate of transmission was 11.8% in the NVP group and 20% in the Zidovudine [7]. The former regimen was thought to be simpler and less expensive as HAART was then not widely available in low and middle income countries and thus became the standard protocol for use in PMTCT programmes in many developing countries.

The PMTCT programme in Ibadan was one of the pilot projects that were established in eight tertiary health institutions in Nigeria in 2002 and was implemented at the University College Hospital. It was supported by the AIDS Prevention Initiative in Nigeria (APIN), a program of the Harvard School of Public Health funded by the Bill and Melinda Gates Foundation. The goal of the pilot project was to generate information for the formulation of a national policy and implementation guidelines for a comprehensive PMTCT intervention in Nigeria. The purpose was to provide effective PMTCT services for women of reproductive age in selected reproductive health facilities in Nigeria [8]. The Federal Government of Nigeria put in place some key indicators to measure the success of the programme over time. ARV prophylaxis in mother consisted of single dose Nevirapine in labour in the first years and was later changed in the 4th year of review to the new national protocol (adapted from the revised World Health Organization protocol) [9]. In the new protocol, the ARV treatment and prophylaxis are selected based on the various clinical settings. The status of babies was evaluated at 18 months using Enzyme linked Immunosorbent Assay (ELISA). We have since 2006 begun to utilize PCR DNA to determine the HIV status of babies delivered to HIV positive mothers.

This evaluation of PMTCT is important to identify gaps in the operation of the service, responsible factors and possible strategies for improvement. This review was undertaken at the end of five operational years during which scaling up to other sites had taken place. We evaluated service uptake and performance of the PMTCT programme in Ibadan using the national key indicators.

Methods

The University College Hospital (UCH) is one of the largest hospitals in Nigeria. It is a tertiary health facility and is situated in Ibadan, South Western Nigeria. The centre was one of the PMTCT pilot sites in the country. The PMTCT programme involved HIV testing and counselling for all women at antenatal care and during labour for those not previously tested. HIV screening was carried out with ELISA until 2005 when rapid test kits became available. Confirmation was by Western Blot. ELISA test results were received at least two weeks after testing while rapid test results were received within one hour. ARV prophylaxis was offered to all HIV positive women and their babies. The programme data were maintained in registers. The PMTCT database consisted of antenatal and delivery records of women who were enrolled into the programme and accessed care in the antenatal clinics of the UCH and its satellite sites. The PMTCT data for the period between July 2002 and June 2007 were retrieved. Information extracted included HIV testing uptake, number of HIV positive women, partner testing, mode of delivery, ARV therapy, infant feeding choice and infant testing results. The infant test results included only the cohort of children who were delivered and enrolled into the programme up to the end of December of 2005 such that they were eligible for 18months testing before June 2007. Infant testing at 18 months was carried out using the ELISA technique.

Results

A total of 51,952 women attended first antenatal visits and received HIV pre-test counselling. Of these, 51,614 (99.5%) accepted HIV test and were tested and 49134 (95.2%) returned for their results. Uptake of HIV testing improved over the years with an

total of 942 deliveries (including 5 multiple pregnancies) and ARV prophylaxis was recorded among 897 (95.2%) babies (Table 2). Figure 1 illustrates the modes of delivery among the HIV positive women.

increase from 1,391 in the 1st year to 19,689 in the 5th year. Out of the tested patients, 2,152 (4.2%) were confirmed to be HIV positive. Partners of positive patients accepting HIV testing were 361(16.7%) as shown in Table 1. There were a

Table 1: Programme performance using key indicators for new clients in the programme

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
New ANC Clients	1391	1434	12150	17288	19689	51952
No. pre-test counselled	1391	1431	12150	17244	19654	51870
(% of new clients)	(100)	(99.8)	(100)	(99.7)	(99.8)	(99.8)
Accepted HIV test	1353	1393	12066	17178	19624	51614
(% of counselled clients)	(97.3)	(97.1)	(99.3)	(99.6)	(99.8)	(99.5)
HIV Positive clients	94	127	495	667	774	2157
(% of tested clients)	(6.9)	(9.1)	(4.1)	(3.9)	(3.9)	(4.2)
No. post-test counselled	804	1173	11290	16469	19398	49134
(returned for result)	(59)	(84.2)	(93.6)	(95.9)	(98.9)	(95.2)
(% of tested clients)						
Partners accepting HIV	13	63	140	74	71	361
testing (% of positive clients)	(13.8)	(49.6)	(28.2)	(11.1)	(9.2)	(16.7)

Table 2: Key indicators in HIV positive clients in the programme

Indicator	Year 1 (%)	Year 2 (%)	Year 3 (%)	Year 4 (%)	Year 5 (%)	Total (%)
HIV positive clients	94	127	495	667	774	2157
HIV positive tested Partners	7(7.5%)	12(9.5%)	32(6.5%)	19(2.9%)	19(2.5%)	89(4.1%)
ARV prophylaxis in mother	31(33%)	79(62.2%)	117(23.4%)	273(40.9%)	345(44.6%)	845(39.2%)
Total Deliveries	46 (48.9%)	92 (72.4%)	158 (31.9%)	289 (43.3%)	357(46.1%)	942(43.7%)
(% of HIV positive clients)						
ARV prophylaxis in babies	40(42.6%)	90(70.9%)	153(30.9%)	277(41.5%)	337(43.5%)	897(41.6%)
(% of HIV positive clients)						
(% of positive clients	(87%)	(97.8%)	(96.8%)	(95.9%)	(94.4%)	(95.2%)
delivering in programme)						

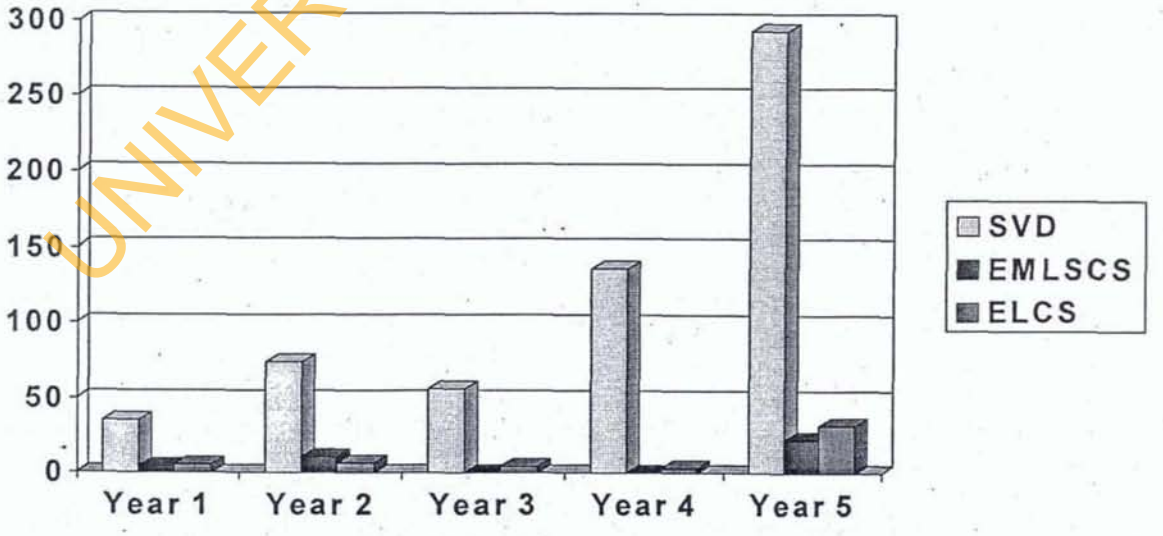

Fig. 1: Mode of delivery among HIV positive client

Table 3: Infant HIV testing at 18 months and transmission rate

No of babies eligible for testing (≥18months)	303
No of reported infant deaths	33/303 (10.9%)
No of babies tested at ≥18months	207/303 (68.3%)
No of babies with results	196
No of babies testing positive at ≥ 18months	17/196 (8.7%)
No of mothers who returned for disclosure of babies' results	119/207 (57.5%)

Table 3 shows that out of 303 babies who were ≥18months and due for ELISA testing within the study period, 33(10.9%) had died and 207(68.3%) babies reported for the test. Of the infants with test results, 17/196 (8.7%) were HIV positive. The results for the remaining 11 babies were not traceable.

Table 4: Mode of delivery and infant feeding practice of HIV positive babies (N= 17)

Mode of delivery	No	Feeding Practice	No
SVD	14	Formula feeding	14
ELCS	2	Breastfeeding	0
EMLSCS	1	Mixed feeding	3

For the 17 babies who tested positive at 18months, the mode of delivery and infant feeding practice is shown in table 4. Fourteen babies were delivered by SVD, 2 by ELCS and 1 by EMLSCS. The infant feeding practice was infant formula in 14, mixed feeding in 3 and none of the babies was breastfed. Table 5 shows the infant feeding practices among the HIV positive clients. Infant feeding data were available for 918 clients out of the 942 confirmed HIV positive women. Seven hundred and eighty-eight (85.8%) mothers practiced formula feeding, 14 (1.5%) practiced mixed feeding and the remaining 116 (12.6%) breastfeed.

Discussion

HIV counselling and testing is the entry point into PMTCT as it helps to detect maternal infection so that needed interventions can be implemented. The uptake of HIV testing and access to subsequent PMTCT services showed an increasing trend over the years. Acceptability of HIV testing and counselling rose from 97% in the first year to 99.5% in the 5th year. Several factors might have contributed to the increasing testing uptake. The human and infrastructural capacities of the programme in Ibadan had improved remarkably. Shortage of staff in the Antenatal Clinic had initially resulted in limited Voluntary Testing and Counselling services in the early years of the programme. This was addressed by employment and training of lay counsellors by the programme. HIV counselling and testing was also integrated as a routine component of antenatal care in the facility in 2005 using the 'opt-out' approach where by all clients are offered HIV testing routinely but are allowed to refuse if they so wished. Prior to that, HIV counselling using the "opt-in" approach was carried out with a lot of stigma and discrimination. In urban Zimbabwe the acceptance rate was reported to range between 20 % and 63% but increased to almost 100% after the routine "opt-out" approach was implemented [10]. This approach has been equally successful in increasing testing uptake in other settings in sub-Saharan Africa [11,12].

Table 5: Infant feeding practices among HIV positive clients

Feeding practice	Year 1 No (%)	Year 2 No (%)	Year 3 No (%)	Year 4 No (%)	Year 5 No (%)	Total No (%)
Formula feeding	29 (63.1%)	76(82.6%)	131(86.8%)	224 (79.7%)	328(94.3%)	788(85.8%)
Breast feeding	14 (30.4%)	14(15.2%)	16(10.6%)	54(19.2%)	18(5.17%)	116(12.6%)
Mixed feeding	3(6.5%)	2(2.2%)	4(2.7%)	3(1.1%)	2(0.6%)	14(1.5%)
Total	46 (100%)	92(100%)	151(100%)	281(100%)	348(100%)	918(100%)

Same day HIV result policy had also been introduced in 2005 in the centre, whereby rapid HIV tests are carried out after pre-test counselling and results disclosed within one hour. This has reduced the drop out rate as the clients no longer have to wait for long periods to obtain their results as obtained when ELISA technique was adopted for testing. The percentage of clients returning for their results increased significantly from 59% in the first year to 98.9% in the 5th year. Rapid tests and same day HIV results had also been reported to significantly increase acceptance of HIV testing in a PMTCT programme in Malawi [13]. Other factors that have

contributed to increased acceptance of HIV testing in our centre include availability of ARVs for PMTCT and consistency in the supply of test kits and consumables.

In an evaluation of pilot PMTCT programmes in eleven low-income countries in Africa, Asia and Latin America aimed at testing the feasibility, impact and sustainability of PMTCT programs in resource-constrained countries; it was found that fewer than 25% of HIV positive women seeking antenatal care received ARV drugs [14]. ARV use in the mothers (either in pregnancy and or in labour) for total number of HIV positive women accessing PMTCT ranged between 33% and 62.2% while 95.2% of the babies received prophylaxis. ARVs reduce mother-to-child transmission of HIV either by lowering plasma viral load in pregnant women or through post-exposure prophylaxis in their newborns. It is therefore important to intensify efforts to improve the uptake in the PMTCT programme.

The level of partner participation increased slightly over the years but the coverage rate had remained low, much below 50% of the number of women testing positive. This area needs to be improved. Men play a key role in the decision making process in Nigeria. Women may decline testing especially when there is no partner consent or support [15]. If the first partner to test is the woman, she may be blamed for bringing HIV into the relationship [16] and the male partner may react with violence [17]. Couple counselling should therefore be encouraged. Partner disclosure may increase male involvement in testing and other PMTCT programme interventions.

Sentinel surveys in Nigeria showed an initial rise in the prevalence of HIV from 1% in 2001 to a peak of 5.8% in 2003 and then a decline to 4.4% in 2005 [3]. In comparison, the estimated sero-prevalence rate from the sentinel survey of antenatal patients in Oyo State where Ibadan is situated had remained less than 3% over the same period. The prevalence rate of HIV among the women tested in the programme in the first year was 6.9%, increased to 9.1% in the second year and subsequently reduced to 3.9% by the fifth year. The explanation for the initial high prevalence rates among the tested clients in the first years of the programme was that the Hospital being a tertiary level facility and the only PMTCT site in the state at that time received many referrals from other health facilities in the state and its environs. Decentralization of the programme with scaling up to some secondary and primary health care facilities which occurred subsequently reflects on the reducing trend in the last year of review. There has also been a general increase in the level of awareness of HIV in the general population [3]. A wider range of ARVs have also become available for treatment of HIV. The main site (UCH) being a tertiary hospital began decentralization of the PMTCT programme in the third year by scaling up to secondary and primary level hospitals including health facilities in both private and public sectors.

Vaginal delivery was the preferred mode of delivery as caesarean delivery is obviously not favoured in our community. This may also be related to the cost of such a procedure and the risks associated with it in a resource-limited setting. There is also stigma associated with this mode of delivery even in the general population which has made it highly unpopular [18]. Previous studies have shown that the rate of MTCT was reduced by about 50% with elective Caesarean delivery prior to the onset of labour [19]. The rate of elective Caesarean delivery in this study remained low over the years corroborating the low level of acceptance of this mode of delivery in the community. This is in spite of the free delivery service which the Federal Government of Nigeria and the implementing partners have introduced among HIV positive pregnant women.

The feeding choices varied over the years with an increase in the proportion of women opting for formula feeds. Capacity building with employment and training of PMTCT counsellors might have enhanced infant feeding counselling. Prior to this, the programme suffered from redeployment of trained counsellors to other unrelated units in the hospital. The change in the trend may also be related to the availability of free infant formula to women opting for infant formula which commenced in the 2nd year of the programme. During infant feeding counselling, it was not the practice to disclose to the women that breast milk substitute (BMS) was available free of charge in the programme. However, information on the availability of BMS may filter through other women in the programme when they discussed during support group meetings. This may influence unduly the preference for infant formula rather than breastfeeding.

The ultimate impact of PMTCT interventions should translate to lower vertical transmission rates of HIV to the infants. Rates of less than 2% have been reported [6]. The transmission rate of 8.7% reported in this study was relatively low compared to the estimated risk of vertical transmission of HIV without antiretroviral treatment of about 25% to 35%

[4]. However, this result should be interpreted with caution as it may not fully represent the transmission rates as all the eligible children were not tested. It is also important to consider that the reported deaths (10.7%) out of the number of children eligible for testing had not been included in the transmission rate analysis. In order to adequately review the trend in the transmission rate, the yearly rates would have been more appropriate so as to measure the impact of changes that had occurred in the programme over the years. Most of the children who were eligible for 18months testing within the reporting period were delivered at a time when single dose peripartum Nevirapine was the practice. Single dose intra-partum and neonatal Nevirapine was considered an effective and relatively easy medical intervention that had been shown to reduce the risk of HIV transmission by 40% compared to natural transmission, to a rate of 12% at 6-8 weeks [7]. This regimen has since been changed in the Nigerian PMTCT programme in line with the current WHO recommendations on ARV prophylaxis in both mother and child [20]. Single dose Nevirapine has been associated with development of resistant virus, which limits its usefulness when treating HIV infection in the long term [21]. Early diagnosis of infants using DNA PCR at six weeks and three months had since become available in our programme. More potent ARVs will result in lower transmission rates as has been demonstrated in a recent report of an evaluation of PMTCT interventions in multiple centers located across Nigeria [22]

Follow up of mother-infant pairs is a challenge to the programme. Collection of test results and mother-child follow-up were also found to be among the most challenging activities in the implementation of PMTCT programmes in Zimbabwe and South Africa [11,23]. This should help curtail a major problem encountered in our program which was loss to follow up before the 18 months testing with ELISA. Knowledge of HIV status soon after delivery will re-enforce positive behaviours.

Conclusion

There has been progress in the UCH programme, reflected in the increase in the number of new clients accessing PMTCT service. However, certain aspects especially partner involvement and infant follow up testing were challenges to the programme. Regular evaluation of the PMTCT programme should be a continuous process as guidelines and best practices are reviewed. These would usually necessitate changes in the protocols for management of pregnant women and follow up of the infants.

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Received: 07/05/09
Accepted: 25/03/10