

Practice of Prevention of Mother-to-Child Transmission of HIV in the Gynecology-Obstetrics Department of the Ignace Deen National Hospital in Conakry

Massa Keita^{1*}, Alhassane II Sow¹, Abdoulaye Sidibé¹, Ibrahima Tangaly Diallo², Abdourahamane Diallo¹, Telly Sy¹

¹Gynecology-Obstetrics Department, National Hospital of Ignace Deen, Conakry, Guinea

²Gynecology-Obstetrics Department, Flamboyants Medical Communal Center, Conakry, Guinea

Email: *massakeit@gmail.com

How to cite this paper: Keita, M., Sow, A.II, Sidibé, A., Diallo, I.T., Diallo, A. and Sy, T. (2025) Practice of Prevention of Mother-to-Child Transmission of HIV in the Gynecology-Obstetrics Department of the Ignace Deen National Hospital in Conakry. *Open Journal of Obstetrics and Gynecology*, 15, 1326-1340. <https://doi.org/10.4236/ojog.2025.158110>

Received: July 25, 2025

Accepted: August 25, 2025

Published: August 28, 2025

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Abstract

Introduction: Prevention of mother-to-child transmission, an important part of the overall management of HIV/AIDS infection, remains a challenge in the majority of resource-limited countries. **Materials and Methods:** This was a 6-month descriptive cross-sectional study from July 1 to December 31, 2023, carried out in the Gynecology-Obstetrics Department of the Ignace Deen National Hospital in Conakry, involving HIV-positive pregnant and parturient women who gave birth in the department and agreed to participate in the study during the study period. **Results:** The prevalence of HIV infection during pregnancy was (2.23%). The majority of patients were young with an average age of 28.30 ± 6 years, married (85.8%) and not in school (41.3%). The most numerous were pauciparous (40.2%) and those admitted for labor (51.1%) and PROM (23.9%). They were on triple therapy before admission (51.1%), with cesarean section (62%) as the most frequent method of delivery, and all had HIV type I. The viral load was undetectable in 68.7% of cases. Neonatal screening had involved 91.3% of cases and 93.5% of these newborns were put on Niverapine. The vertical transmission rate of HIV infection was 9.5%. **Conclusion:** Analysis of the results of this work shows that the prevalence of HIV infection during pregnancy is not negligible in our context. Early screening, early treatment of HIV-positive mothers and systematic viral load testing could further reduce the rate of vertical transmission of HIV infection.

Keywords

Practice, Prevention of Mother-to-Child Transmission, HIV, Conakry

1. Introduction

Prevention of mother-to-child transmission is the set of measures which contribute to preventing the risk of transmission of the Human Immunodeficiency Virus (HIV) from an HIV-positive mother to her child during pregnancy, labor, delivery or breastfeeding [1]. This transmission is estimated at 20% during pregnancy, 65% at the time of delivery and 15% during breastfeeding. It is the main route of HIV transmission in children under 15 years of age [2]. Prevention of mother-to-child transmission (PMTCT), an important part of the overall management of HIV/AIDS infection, remains a challenge in the majority of resource-limited countries, particularly in Africa [3]. HIV targets and destroys white blood cells, including CD4 T cells, which are essential for coordinating the immune response [4]. In 2016, approximately 160,000 new HIV infections were recorded among children worldwide [5]. According to WHO, 36.9 million people were living with HIV in 2017, including 1.8 million children. The global coverage rate of antiretroviral treatment for pregnant and breastfeeding women living with HIV was 80%. The WHO African region, where 25.7 million people were living with HIV in 2017, was the most affected region [6]. Sub-Saharan Africa is the most affected with 23.5 million, or 69% of the people infected worldwide. There are 200,000 new infections among children, or an average of 600 cases per day. This represents 90% of HIV transmissions among children worldwide [7]. Women and children are the most vulnerable populations in this pandemic due to their fragility, low education levels, insufficient knowledge about mother-to-child transmission and prevention of HIV, and the lack of early detection. At the end of 2019, the number of pregnant women living with HIV was estimated at 1.3 million and the number of children aged 0 to 14 years at 1.8 million [8]. In the absence of any intervention, pregnant women living with HIV have a high risk of transmitting the virus to their children [9]. In Burkina Faso, the provision of PMTCT care has gradually improved. In 2015, the coverage rate of PMTCT sites was 98.22% with a PMTCT adherence rate of pregnant women of 86.14%. The residual transmission rate fell from 5.30% in 2014 to 4.95% in 2015 [10]. In Senegal, the transmission rate was 4.1% in 2015 [11]. According to the 2018 Guinea DHS, the prevalence of HIV infection among women is estimated at 1.6% [12]. A study published by MSF in 2022 reported that MTCT is between 7 and 12% in the country [13]. Thus, strategies have been defined to reduce the risk of transmission of HIV from mother to child based on the use of short and long regimens of antiretrovirals, associated with the application of obstetric and low-risk feeding measures [10]. The high rate of mother-to-child transmission of HIV in Guinea and the lack of recent data on the subject in the department motivated the realization of this work.

The objective of this work was to study the practice of PMTCT/HIV in the Gynecology-Obstetrics Department of the Ignace Deen National Hospital in Conakry in 2023.

2. Methodology

2.1. Type and Duration of Study

This was a 6-month descriptive cross-sectional study from July 1 to December 31, 2023, conducted in the Obstetrics and Gynecology Department of the Ignace Deen National Hospital in Conakry, focusing on HIV-positive women who gave birth in the department during the study period.

2.2. Selection Criteria

2.2.1. Inclusion Criteria

All HIV-positive women who gave birth in the department and agreed to participate were included in this study.

2.2.2. Exclusion Criteria

Women who delivered a stillbirth or whose newborns died within hours of delivery were excluded from this study.

2.2.3. Exclusion Criteria: The Following Were Not Included in This Study

- All HIV-positive parturients who did not agree to participate in the study;
- All parturients who gave birth outside the ward and were referred for complications.

2.3. Sample Age

We have carried out an exhaustive recruitment of all pregnant and parturient women who met the inclusion criteria.

2.4. Study Variables

They were sociodemographic, obstetric, HIV screening, therapeutic and neonatal.

2.5. Data Entry and Analysis

The data were entered using Excel software from the Office 2016 package and then analyzed using SPSS software in its version 26.0.

2.6. Ethics

Informed consent was obtained from participants, confidentiality and anonymity were required.

3. Results

3.1. Discussion

In this work, we attempted to study the practice of PMTCT in the Gynecology-

Obstetrics Department of the Ignace Deen National Hospital. These results show a significant frequency of HIV infection during pregnancy (2.52%) (**Figure 1**). However, we encountered some difficulties, including the failure to perform the viral load and the CD4 lymphocyte rate and the discontinuation of ARVs for antiretroviral prophylaxis. However, this study remains of interest because it allowed us to know the frequency of HIV infection during pregnancy, the vertical transmission rate and the maternal and neonatal care provided in the department.

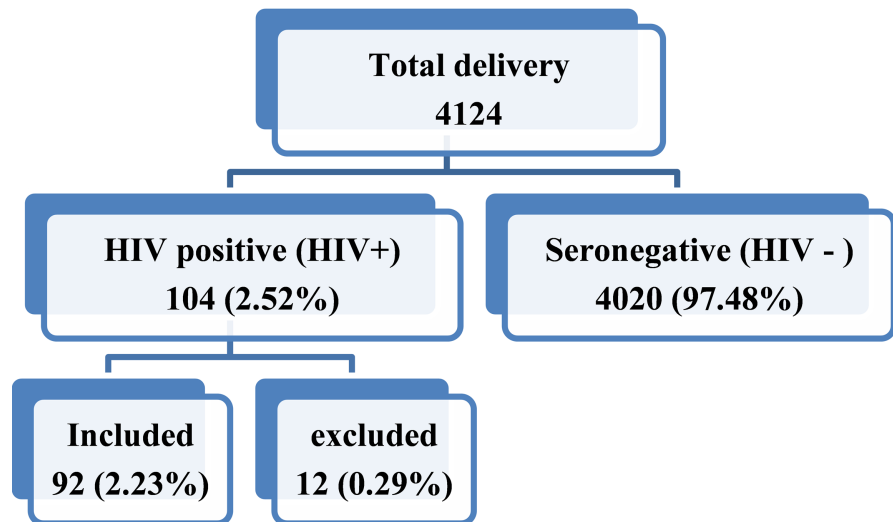


Figure 1. Flowchart of the frequency of HIV infection during pregnancy.

This frequency observed in this series is lower than that of Diallo MH *et al.* [14] who in 2016 found a rate of 6.71% of pregnant women infected with HIV in a level II maternity hospital in Guinea. This difference could be explained by the presence in this center of the NGO Doctors Without Borders which has significantly improved the attendance of the center in terms of monitoring and care of pregnant women infected with HIV.

Young pregnant women were the most represented in our sample with an average age of 28.30 years (**Table 1**). A similar observation was reported in the study by Diallo MH *et al.* Mentioning a predominance of the 20 - 29 age group (78%) [14]. On the other hand, Izudi J *et al.* in Uganda in 2018 reported that 89% of pregnant women infected with HIV were over 30 years old [15]. For some authors, this predominance of young age could be explained by the precocity of marriage and sexuality [12] [16].

This work shows that the sample was dominated by pregnant women in the informal sector worker (**Table 1**). This observation is similar to that found in a study carried out in Conakry in 2016. with more than half of HIV-positive pregnant women working in the liberal profession (55.56%) [14]. This could be explained by the fact that in Guinea, apart from studies and lack of employment, women engage in remunerative activities to be able to provide for the family. Married women were

the most numerous in this series (85.8%) (**Table 1**). This finding corroborates with the results of Cissé Z *et al.* in Mali in 2020 who reported a proportion of 85.4% of married women [17]. On the other hand, Ngo Nyee A *et al.* in Cameroon in 2018 found that 79% of pregnant women infected with HIV were single [18]. This difference could be explained by the fact that conception outside of marriage is poorly accepted in our country because of religious and cultural constraints.

Table 1. Sociodemographic characteristics of HIV-positive women giving birth in the gynecology-obstetrics department of the Ignace Deen national hospital in Conakry from July 1 to December 31, 2023.

Variables	Staff	Percentage
Age (years)		
15 - 19	7	7.6
20 - 29	50	54.3
30 - 39	32	34.8
≥40	3	3.3
Average: 28.30 ± 6 years; Range: 18 - 43 years; Median: 28 years		
Occupation		
Housewife	20	21.7
Student	8	8.7
Informal sector worker	48	52.2
Employee	16	17.4
Marital status		
Bride	79	85.8
Bachelor	11	12.0
Divorcee	1	1.1
Widow	1	1.1
Educational level		
Not in school	38	41.3
Primary	15	16.3
Secondary	14	15.2
Superior	25	27.2
Admission mode		
Coming by herself	62	67.4
Evacuated	30	32.6

It emerges from this study that uneducated women were the majority of the most represented in the sample (**Table 1**). This result is close to that of Kyba A *et al.* in Burkina Faso in 2017 who found a proportion of 47.8% of uneducated women [19]. On the other hand, a conclusion contrary to ours was reported by Ngo Nyee A *et al.* in Cameroon in 2018, *i.e.* 100% of parturients were educated. This difference could be explained by the low rate of schooling of young girls in our country [18].

We identified 23.9% of HIV-positive pregnant women with premature rupture of membranes (**Table 2**). A higher proportion of premature rupture of membranes in HIV-positive women was found by some authors (80%) [20]. It is described in the literature that HIV infection significantly increases the risk of premature delivery, which would explain this high rate of premature rupture of membranes [21].

Table 2. Distribution of HIV-positive women giving birth according to the reasons for admission to the gynecology-obstetrics department of the Ignace Deen National Hospital in Conakry from July 1 to December 31, 2023.

Reasons	Staff	Percentage
RPM	22	23.9
Hemorrhage	5	5.4
SFA	5	5.4
Decrease in MAF	2	2.2
PES + Eclampsia	2	2.2
Abdominopelvic pain	47	51.1
Prophylactic cesarean section	5	5.4
Severe oligohydramnios	2	2.2
Vulvar condyloma	1	1.1
Anemia	1	1.1

RPM: Premature rupture of membranes; AFS: Acute fetal distress; AFM: Active fetal movements; PES: Severe preeclampsia.

We found that multigravida and pauciparous women were the most numerous among pregnant women infected with HIV (**Table 3**). An identical finding to ours was reported in Malian series in 2020 and 2021 [17] [22].

In this study, the majority of HIV-positive pregnant women admitted to the department had completed fewer than 4 ANC's (**Table 4**). Our conclusion corroborates that of Mwembo A *et al.* in the DRC in 2012 [23]. On the other hand, Cissé Z *et al.* found that 1 in 3 HIV-positive patients (33.3%) had not undergone ANC [17]. More than 1/3 of patients discovered their HIV status in the labor and delivery room (**Table 5**). This finding is different from that observed by Ouedraogo-Yugbaré SO

et al., i.e. 19.75% of pregnant women who discovered their HIV status in the labor and delivery room [24]. This late discovery of HIV infection could be explained, on the one hand, by the low rate of prenatal consultations and, on the other hand, by a low rate of counseling for screening for HIV infection during pregnancy. According to literature data, the timing of screening is very useful in PMTCT and the earlier the woman is screened, the more chance her child has of being spared from HIV infection [17].

Table 3. Distribution of HIV-positive women giving birth according to history in the gynecology-obstetrics department of the Ignace Deen national hospital in Conakry from July 1 to December 31, 2023.

Variables	Effective	Percentage
Tares		
HTA	5	5.4
Diabetes	4	4.3
Sickle cell disease	3	3.3
Others	4	4.3
Managed		
Primigravida	23	25.0
Paucigest	33	35.9
Multi-gesture	36	39.1
Mean: 2.90 ± 1.49; range: 1 - 6 Median: 3		
Parity		
Primiparous	28	30.5
Pauci pare	37	40.2
Multiparous	27	29.3
Mean: 2.61 ± 1.35; range: 1 - 6 Median: 2.5		
Abortion		
Yes	12	13.04
No	80	86.96
Stillborn		
Yes	15	16.3
No	77	83.7

Table 4. Distribution of HIV-positive women giving birth according to pregnancy monitoring at the gynecology-obstetrics department of the Ignace Deen National Hospital in Conakry from July 1 to December 31, 2023.

Variables	Staff	Percentage
Number of CPNs		
None	6	6.6
1-3	52	57.1
≥4	33	36.3
Mean: 2.86 ± 1.36; range: 0 - 6 Median: 3		
Location of monitoring		
Hospital	35	38.0
CMC	13	14.1
CS	9	9.9
Clinic/Private practice	35	38.0
PTME website		
Yes	48	52.2
No	44	47.8
Author of CPN		
Doctor	41	44.6
Midwife	48	52.2
Nurse	1	1.1
ATS	2	2.1
Prenatal check-up		
Yes	61	66.3
No	31	33.7
Anemia		
Yes	40	43.5
No	52	56.5
Counseling during CPN		
Yes	56	60.9
No	36	39.1

ATS: Technical health agent; CS: Health center; CMC: Municipal medical center; PTME: Prevention of mother-to-child transmission; CPN: Prenatal consultation.

Table 5. Distribution of HIV-positive women giving birth according to HIV screening in the gynecology-obstetrics department of the Ignace Deen National Hospital in Conakry from July 1 to December 31, 2023.

Variables	Staff	Percentage
Counseling		
Yes	92	100.0
No	0	0.0
Time of the first screening		
Before pregnancy	31	33.7
During pregnancy	23	25.0
During Labor	24	26.1
After childbirth	14	15.2
Author of the screening		
Doctor	69	75.0
Midwife	23	25.0
Type of HIV		
HIV1	92	100.0
HIV2	00	00.0
Co-infection		
Yes	19	20.6
No	73	79.4

In this study, all the parturients screened had HIV type 1 (HIV1) (**Table 5**). Our result is similar to those of Diallo MH in Guinea in 2016 and Ouedraogo-yugbaré SO in Burkina Faso in 2015 who found respectively 97.53% and 95.38% of HIV type 1 [14] [24]. The fact that HIV type 1 is the most widespread throughout the world, the most virulent and more sexually transmissible would explain its higher proportion in our context [20]. We observed that more than 2/3 of the study population received triple ARV therapy, more than half of whom were put on treatment before and during pregnancy (**Table 6**). This observation is different from that of Ngwej DT *et al.* who reported that only 25% of HIV-positive women received ARV treatment before and during pregnancy [20]. Data from the literature show that a well-monitored HIV-positive pregnant woman on ARV treatment significantly reduces the risk of HIV transmission, unlike those not subjected to treatment [25].

This work shows a low rate of achievement of the CD4 count and viral load (**Table 6**). Different results were recorded in the study by Takassi OE *et al.* who

reported that all of their patients had their viral load and CD4 count performed with a proportion of 73.4% of women having an undetectable viral load at the time of delivery and a median CD4 count of 348 cells/mm³ [26]. The low rate of these tests in our context could be explained on the one hand by poor prenatal monitoring and on the other hand by the high cost of the latter.

Table 6. Distribution of HIV-positive women born according to ARV treatment at the Gynecology-Obstetrics Department of the Ignace Deen National Hospital in Conakry from July 1 to December 31, 2023.

Variable	Effective	Percentage
Start of treatment		
Before pregnancy	29	31.5
During pregnancy	20	21.7
After childbirth	23	25.0
Not put on ARVs	20	21.8
Viral load (VL)		
Yes	15	16.3
No	77	83.7
Viral Load Results (n = 15)		
Undetectable	11	68.7
Detectable	5	31.3
CD4 count		
>350 C/mm ³	4	4.3
Not realized	88	95.7
Type of Treatment		
Monotherapy	1	1.1
Triple therapy	71	77.2
None	20	21.7

ARV: Antiretroviral. The majority of pregnancies were at term (89.1%) and in 55.4 % of cases membrane rupture occurred before complete dilation. Vaginal delivery was 38.0% compared to 62.0 % cesarean section. More than 9 out of 10 women gave birth without soft tissue tear and episiotomy was performed in 17.4 % of deliveries.

In this series, more than 2 out of 10 patients had experienced PROM and early rupture of membranes. Our results are lower than those of Ngwej DT *et al.* in the DRC in 2015 who reported 40% PROM and 60% early rupture of membranes respectively [20]. They found that prolonged rupture of membranes before delivery would promote HIV transmission during labor and delivery [20].

Regarding the mode of delivery, we noted that more than 6 out of 10 HIV-positive parturients had given birth by Cesarean section. Contrary results have been reported in the literature [26]. This difference could be explained by the fact that, in our series, it was most often parturients evacuated from secondary structures presenting maternal and/or fetal complications requiring caesarean section. Our study site is the only level 3 structure in the city of Conakry handling the majority of obstetric emergencies coming from the capital and its outskirts. However, the literature shows that an elective cesarean section is a protective factor and would lead to a significant reduction in the risk of MTCT compared to vaginal delivery [20]. The majority of newborns received an antiseptic wash using chlorhexidine or Dakin Cooper within 30 minutes of delivery (Table 7). This practice helps limit MTCT due to the newborn's contact with various fluids that may contain human immunodeficiency virus. We observed high rates of low birth weight and prematurity. Ngwej DT *et al.* in DRC in 2015 reported a rate of 33% of newborns with low birth weight [20]. While Ouedraogo-yugbaré SO *et al.* found lower proportions of low birth weight (7.89%) and prematurity (16.10%). However, the literature reports that HIV infection on pregnancy significantly increases the risk of premature delivery and intrauterine growth retardation. This is the consequence of an infectious syndrome and anemic syndrome caused or maintained by immunosuppression but also of the direct effect of ARVs on fetal growth [21].

Table 7. Distribution of newborns according to their characteristics and information relating to the prevention of vertical transmission.

Variables	Staff	Percentage
Low birth weight		
Yes	21	22.8
No	71	77.2
Prematurity		
Yes	13	14.1
No	79	85.9
Resuscitation		
Yes	19	20.6
No	73	79.4
Referred to neonatology		
Yes	12	13.0
No	80	87.0
Antiseptic toilet		
Yes	85	92.4
No	7	7.6

Continued

Type of antiseptic used		
Dakin	49	57.6
Chlorhexidine	36	42.4
Recommended breastfeeding method		
Maternal	69	75.0
Artificial	23	25.0
Newborn screening		
Yes	84	91.3
No	8	8.7
PCR results (N = 84)		
HIV detected	8	9.5
HIV undetected	76	90.5
ARV treatment*		
Yes	86	93.5
No	6	6.5

*The ARV used was Nevirapine. The vertical transmission rate of HIV infection was 9.5%.

According to literature data, ARV prophylaxis at birth (0 to 6 weeks) is an alternative that better protects them against HIV infection [25]. In our study, 86 newborns, or 91%, received Nevirapine within 24 hours of delivery (Table 6). Our result corroborates that of Diallo MH *et al.* in Guinea in 2016 reported 91.25% of newborns receiving Nevirapine at birth [14]. However, this finding is different from that of Cissé Z *et al.* in Mali in 2020 reported 22.9% of newborns receiving ARV prophylaxis [17]. This indicates good practice in the prevention of MTCT of HIV in our department.

After counseling on the advantages and disadvantages of each method of breastfeeding, the majority of women preferred exclusive breastfeeding (Table 6). This result is similar to that of Diallo MH *et al.* who reported a rate of 87.5% in their series [14]. A study carried out in Togo in 2017 had shown the superiority of protected breastfeeding compared to artificial breastfeeding in developing countries [26]. Thus, Alvarez-uria G *et al.* in India demonstrated that the risk of infant death was 14 times higher in the group of children on artificial feeding after 12 months. They also showed that bottle-fed children were at greater risk of developing severe malnutrition after the age of two months [27]. This rate could be explained by the fact that women understood the importance of breast milk in the growth and well-being of their infants.

In this study, PCR was performed for 84 newborns, including eight positive cases, with a vertical transmission rate of 9.5% (Table 6). This finding is intermediate to those of Ngwej in the DRC in 2015 and Izudi in Uganda in 2018, which

found 8.5% and 12% respectively [20] [28]. A lower rate was reported in Togo in 2017 (0.46%) [26]. This difference could be explained by the quality of monitoring of women during pregnancy. In the Togolese study, all patients and their newborns were regularly monitored and all had PCR and viral load tests performed. They also administered antiretroviral prophylaxis during labor, which would explain this low vertical transmission of HIV infection in their context.

3.2. Conclusions

The analysis of the results of this work shows that the rate of HIV infection during pregnancy is not negligible in our context. Counseling on HIV testing during ANC remains low, and the majority of patients were tested during pregnancy, labor, and postpartum. HIV-1 was the only type encountered in this study. The rate of non-treatment of ARVs was high, as was the rate of vertical transmission. The majority of newborns received nevirapine within minutes of delivery.

Strengthening HIV screening in all pregnant women during prenatal consultations or in the delivery room, systematically starting ARV treatment on HIV-positive pregnant women and performing viral load testing in these patients could further reduce the rate of vertical transmission of HIV infection and improve maternal and neonatal prognosis.

Conflicts of Interest

There is no conflict of interest in this work.

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