



E-ISSN: 2278-4136

P-ISSN: 2349-8234

<https://www.phytojournal.com>

JPP 2023; 12(4): 30-34

Received: 01-05-2023

Accepted: 10-06-2023

Thanou Mariam

Department of Laboratory of
Biology and Health, UFR
Biosciences, Université Felix
Houphouët Boigny, Abidjan,
Cote d'Ivoire

Ouattara-Soro Fatou Shcherazade

Department of Laboratory of
Biology and Health, UFR
Biosciences, Université Felix
Houphouët Boigny, Abidjan,
Cote d'Ivoire

Abo Yao

National Blood Transfusion
Center (NBTS), Abidjan, Côte
d'Ivoire

Minga Albert

National Blood Transfusion
Center (NBTS), Abidjan, Côte
d'Ivoire

Diomandé Abou

Université Peleforo Gon
Coulibaly, Korhogo, Côte
d'Ivoire

Corresponding Author:**Thanou Mariam**

Laboratory of Biology and
Health, UFR Biosciences,
Université Felix Houphouët
Boigny, Abidjan, Cote d'Ivoire

Clinical parameters of children born to mothers on antiretroviral treatment in three Abidjan hospitals

Thanou Mariam, Ouattara-Soro Fatou Shcherazade, Abo Yao, Minga Albert and Diomandé Abou

DOI: <https://doi.org/10.22271/phyto.2023.v12.i4a.14690>

Abstract

Prevention of mother-to-child transmission (PMTCT) of HIV is a dynamic field. The latest updates from the World Health Organization (WHO) in the context of PMTCT date back to April 2012. The WHO recommends that low-and intermediate-resource countries introduce life-long triple therapy for HIV-positive women (WHO). The aim of the present study is to examine the relationship between maternal serology and clinical parameters in newborns. It is a prospective, descriptive, retro study carried out on 529 HIV-positive and 467 HIV-negative women in three hospitals in the city of Abidjan. Clinical parameters were measured using a balance and a measuring cup, and blood samples were taken. Among the 543 exposed infants, 2 were found to be seropositive after three PCR tests. In 94.9% of seropositive women, delivery was vaginal. Most newborns were born at full term (98.9%) in seropositive patients, with 65.1% having a birth weight of between 2,500 and 3,500 g and a good appgar score (92.7%) at the first minute and (99.5%) at the fifth minute. Breastfeeding was the most common method of delivery, irrespective of the mother's serostatus: 94.3% for seropositive and 97.6% for seronegative mothers. In this study, the mother's serology had no influence on the clinical parameters of newborns on ARV treatment.

Keywords: Life-long triple, exposed infants, measuring cup

Introduction

Mother-to-child transmission of HIV is the main route of paediatric infection. This transmission can occur in utero during the last weeks of pregnancy, at the time of delivery and/or during breast-feeding. It accounts for over 90% of infections in children. The number of new infections in children aged 0 to 14 is estimated at 1891 (Spectrum, 2020) ^[1] and mortality among all infected children is estimated at 1659, or 13% of all AIDS-related deaths. This mother-to-child transmission (MTCT) is prevented by maternal antiretrovirals (ARVs) started during pregnancy and continued until the end of breast feeding (Option B) or for life (Opion B +) (Coutsoudis *et al.*, 1999, Asbjornsdottir *et al.*, 2013) ^[2,3]. Thanks to the use of antiretroviral combinations during pregnancy and the frequent practice of caesarean sections before the onset of labour, the risk of mother-to-child transmission is becoming increasingly low. In 2015, 77% of pregnant women living with HIV had access to antiretroviral drugs to prevent HIV transmission to their babies. HIV infection associated with pregnancy makes it a high-risk pregnancy. PMTCT is an important part of the fight against HIV. In developed countries, these measures have resulted in mother-to-child transmission (MTCT) rates of less than 2% (Khuong-Josses *et al.* 2002) ^[4]. Despite much previous work in the field of PMTCT, it seems that the impact of the mother's serology on the children's clinical parameters has not been sufficiently explored. The aim of the present study is to examine the relationship between the mother's serology and the clinical parameters of newborns.

Materials and Methods**Materials****Clinical parameters**

Weight and height were measured using scales and a toise. The head circumference of newborns was measured using a tape measure. These measured parameters were recorded in the child's birth book or birth register and then transferred to our charts. The DBS Kit was used to collect blood from the heel of infants for screening.

The Apgar score was taken after birth and repeated 5 minutes later (Apgar, 1953) [5]. The maximum mal score is 10, suggesting the best possible health condition, while a score below 7 indicates distress. Below 3, the newborn requires urgent resuscitation.

Methods

Type and location of study

This was a prospective, descriptive, retro study of 529 HIV-positive and 467 HIV-negative women in three hospitals in the city of Abidjan. Located in the lagoon region of southern Côte d'Ivoire, the district of Abidjan comprises 13 communes covering an area of 513 km². The city is located in a hot, humid sub-equatorial climate zone, with 2 rainy and 2 dry seasons (UN-Habitat, 2012) [6].

Sampling

This sampling method is less traumatic than venous sampling, and requires a very small quantity of blood to perform. A small puncture is made on the heel (big toe, or fingertip) with a 2 mm retractable lancet, and a few droplets of blood are collected on a piece of absorbent filter paper. The paper is then left to dry on a special shelf. Once dry, the sample is placed in a hermetically sealed plastic bag (zip-lock bag), together with a desiccant sachet and a humidity indicator card.

PCR analysis methods

First PCR result at 6 weeks

At birth, every child born of an HIV-positive mother (exposed child) is given Nevirapine syrup until the 6th week, when PCR is performed:

- If the 1st PCR is negative, another sample is taken for the 2nd PCR (at 9 months), using Cotrimoxazole (syrup).
- If the 1st PCR is positive, another sample is taken for the 2nd confirmatory PCR. The child's ARV treatment is systematically initiated with continued administration of Cotrimoxazole (PNLS, 2016) [7].

PCR result at 9 months:

- If PCR is negative at 9 months, 3rd PCR is performed (at weaning).
- If PCR is positive, the 3rd PCR is performed (at weaning).

PCR result at weaning

- If the PCR is negative and the child has not been breastfed for at least 6 weeks, the child is declared definitively HIV-free.
- If the PCR is positive, the child is declared HIV-infected. The child's ARV treatment is continued. The definitive status for a breastfed child will be made 6 weeks after the cessation of breastfeeding (PNLS, 2016) [7].

Statistical analysis

Data were collected from a survey form, entered using Excel 2013 and then exported to Statistic Package for Social Sciences version 25 (SPSS). Survey results were presented in the form of figures.

Results and discussion

In this chapter, the results were broken down according to the two serologies (HIV-positive and HIV-negative), as follows: 529 serology-positive women and 467 serology-negative women. These women gave birth to 1019 newborns. Of these, 543 (7 twin births) were born to HIV-positive mothers and

476 to HIV-negative mothers (3 twin births and one triplet birth). The 543 exposed infants, i.e. those born to infected mothers, received three PCR tests as part of the prevention of HIV transmission. The first at 6 weeks, the second at 9 months and the third at weaning. Of the 543 infants exposed, 541 were found to be HIV-negative and 2 were found to be HIV-positive after the three PCRs. All these infants also received Cotrimoxazol syrup at birth.

Delivery parameters

Mode of delivery

Delivery was vaginal in 94.9% of seropositive women and 95.3% of seronegative women (Figure 1).

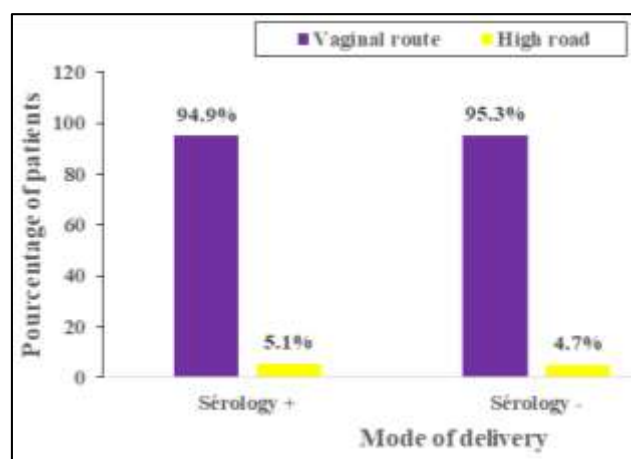


Fig 1: Distribution of modes of delivery according to parturient serostatus

Duration of pregnancy

Full-term pregnancies accounted for 98.9% of patients with seropositive mothers and 96.1% with seronegative mothers. Preterm births were very low, at 1.1% among seropositive (+) parturients and 3% among seronegative (-) parturients. On the other hand, post-term births were only observed in the seronegative (-) group. A significant difference was observed between pregnancy duration and maternal serology (Figure 2).

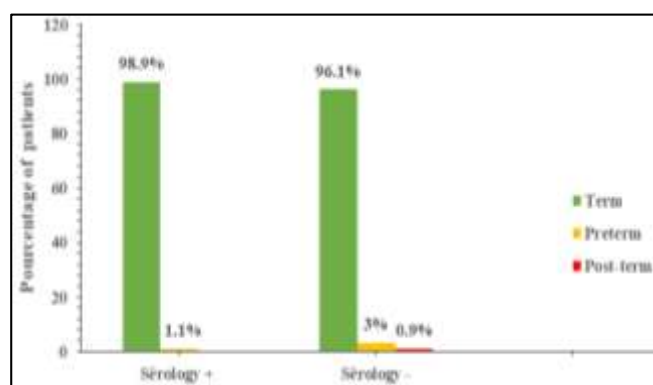


Fig 2: Pregnancy outcomes by parturient HIV status

Breastfeeding mode

Breast-feeding was the most common method of feeding, irrespective of the mother's serostatus: 94.3% for seropositive women and 97.6% for seronegative women. In the case of artificial breastfeeding, 4.5% of women with positive serology (+) and 1.3% with negative serology (-) were breastfeeding mothers. Mixed breastfeeding was 1.2% for seropositive mothers and 1.1% for seronegative mothers (Figure 3).

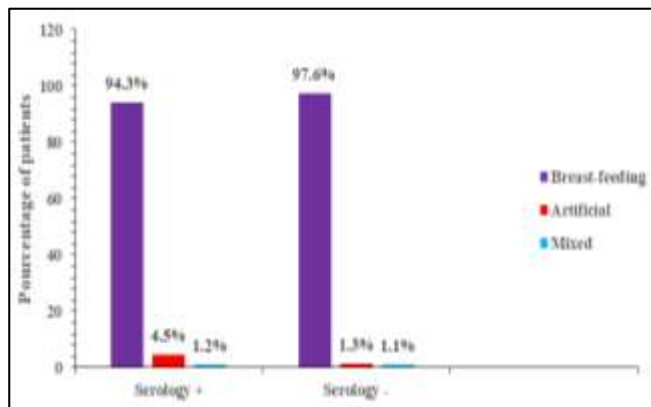


Fig 3: Distribution of breastfeeding mode according to parturient serostatus

Newborn parameters at birth

Birth weight

The results obtained showed that, in terms of this clinical parameter (birth weight), the average weight of newborns was 3120±21.32 g, with extremes ranging from 1000 g to 5100 g. Mothers with positive serology gave birth to 11.9% low birthweight babies, i.e. under 2,500 g, 65.1% normal birthweight babies between 2,500 and 3,500 g, and 23% high birthweight babies (macrosomes) over 3,500 g (Figure 4).

As for negative serology, 8.2% of births had birth weights under 2500 g, 72.7% between 2500 and 3500 g and 19.1% over 3500 g (macrosomic newborns).

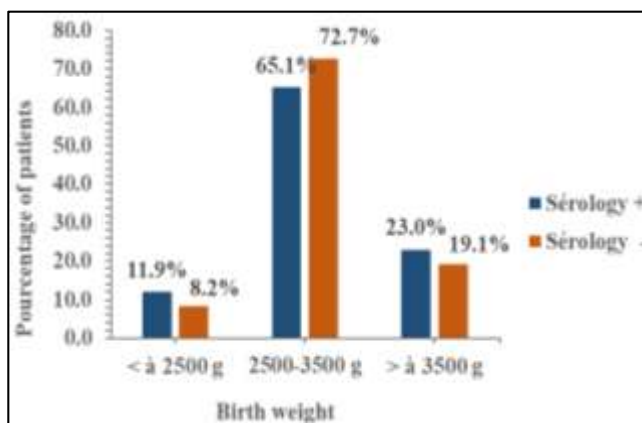


Fig 4: Distribution of birth weight according to parturient HIV status

Birth size

At birth, 8.8% of newborns of seropositive (+) mothers had a birth height of less than 46 cm, 70.2% between 46-50 cm and 21% greater than 50 cm. On the other hand, 6.6% of births to mothers of seronegative status were under 46 cm, 75.3% between 46-50 cm and 18.1% over 50 cm (Figure 5)

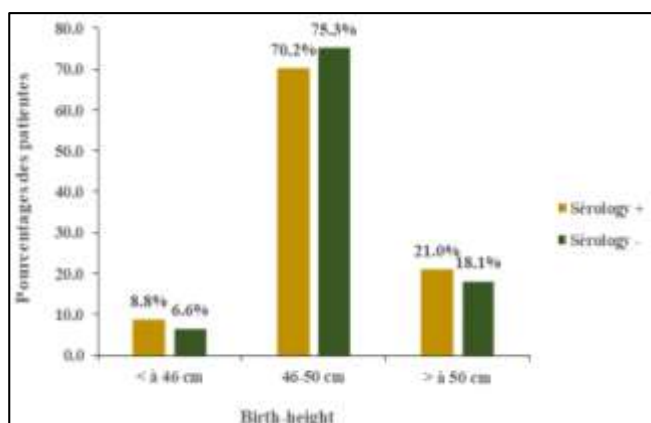


Fig 5: Distribution of birth sizes according to parturient serostatus

Cephalic perimeter

The results showed that 21% of newborns of seropositive mothers had a cephalic perimeter of less than 32 cm, 72% between 32-35 cm and 7% greater than 32 cm. In contrast, 15.4% of those born to HIV-negative mothers had a head circumference of less than 32 cm, 82.1% between 32-35 cm and 2.5% greater than 32 cm (Figure 6).

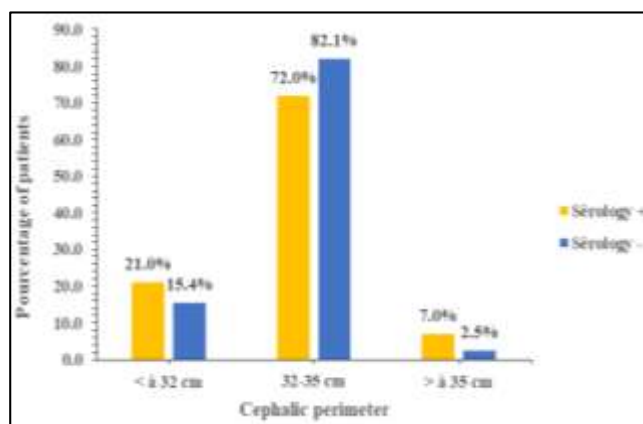


Fig 6: Distribution of cephalic perimeters according to parturient serological status

Status of newborns at birth (Apgar score)

Results showed that 92.7% of newborns of seropositive (+) and 89.9% of seropositive (-) mothers had an Apgar score greater than or equal to 7 at the first minute, while 7.3% of seropositive (+) mothers had an Apgar score lower than 7 and 10.1% of seropositive (-) mothers had an Apgar score lower than 7. Statistics showed that at five minutes, 99.5% of newborns of seropositive (+) mothers and 98.4% of those of seronegative (-) mothers had an Apgar score greater than or equal to 7. On the other hand, 0.5% of births to seropositive (+) mothers and 1.6% to seropositive (-) mothers had an Apgar score of less than 7. It is important to note that there was a significant difference in Apgar scores between the two serologies (Figure 7).

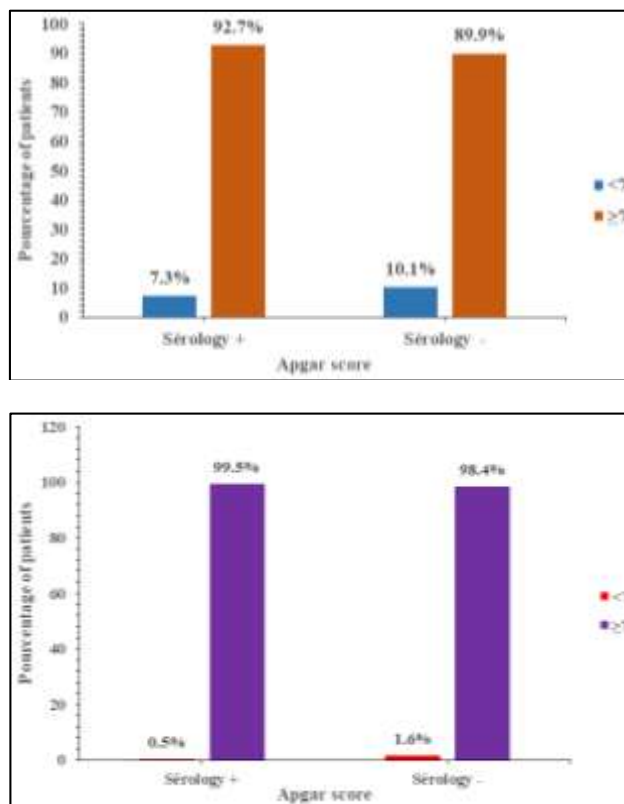


Fig 7: Distribution of cephalic perimeters according to parturient serological status
A: Apgar score at 1 minute
B: Apgar score at 5 minutes

Discussion

The vaginal route was the preferred mode of delivery in this study, with 94.9% of HIV-positive pregnant women. This may be explained by the viral load of our patients. Bagayogo (2004) [8] also found that 83.90% of mothers were infected. According to this work, the high rate of vaginal delivery among infected women is due to their lower viral load. Also, Diouf *et al.*, (2016) [9] had noted a high rate of deliveries out of 37 cases, i.e. 88.10%. An earlier study by Diop (2007) [10] in the same facility found similar results, with 95% of deliveries by vaginal route. The latter was also more favored in the work of Traoré *et al.*, (2019) [11] with a rate of 89% natural vaginal delivery on 33 patients.

In terms of pregnancy duration, full-term deliveries were observed in almost all cases in both serologies. Our results are comparable to those of Diouf *et al.*, (2016) [9] who found 95.24% full-term deliveries among HIV-positive mothers followed in Guédiawaye, Senegal.

Regarding the type of feeding for newborns of HIV-positive mothers, exclusive breastfeeding was chosen with 94%. These results can be explained by the fact that breastfeeding is the recommended practice in Côte d'Ivoire. Indeed, almost all women who had undergone counseling, screening and triple therapy during pregnancy were determined to choose exclusive breastfeeding as the mode of feeding their newborns. Diouf *et al.*, (2016) [9], had obtained a rate of infants under exclusive breastfeeding of 88.95%. The same was true of Effoh *et al.*, (2018) [12] and Millogo-Traoré *et al.*, (2008) [13]. Indeed, Effoh (2008) [12] had obtained a rate of 88%, and the same was true in Burkina Faso in the study by Millogo-Traoré *et al.*, (2008) [13] with a rate of 62.2%.

The average birth weight in this study was 3123.14 g for HIV-positive women and 3119.41 g for HIV-negative women. For birth weights below 2500g, 11.9% of children were born to seropositive mothers and 8.2% to seronegative mothers. In the 2500-3500g range, 65.1% and 72.7% of children born to seropositive and seronegative mothers respectively were

infected. And finally, for newborns weighing over 3500g, 23% were born to HIV-positive pregnant women and 19.1% to HIV-negative women. Only 11.9% of children born to seropositive mothers were obtained. This finding leads us to conclude that the mother's nutritional status and the quality of maternal follow-up play a role in the weight of newborns. A seropositive pregnant woman should therefore have a good nutritional status. According to Essomba *et al.*, (2018) [14], a birth weight below 2,500g constitutes a risk of neonatal AIDS. There is every reason to believe that the progression of the disease in the child is more rapid in cases of significant immune deficiency in the mother, thus affecting her birth weight Diouf *et al.*, (2016) [9].

The association between HIV and low birth weight is frequent. HIV-positive patients in pregnancy should be the subject of special monitoring by health personnel with the aim of limiting the onset of various infections and thereby reducing the frequency of LBW. (Jou, 2009) [15] stated in his study that PPN is more frequent in HIV-positive women, particularly those with opportunistic infections.

Birth size was between 47-50 cm in 70.2% and over 50 cm in 21%, and head circumference was between 32-35 cm in 72% and over 35 cm in 7% of infected parturients. Kamenga *et al.* (1991) [16] demonstrated that although HIV is a factor in PPN, it does not affect other indices of fetal growth such as head circumference and height. In this study, fetal condition was characterized by a good Apgar score. The vast majority of infected pregnant women had an Apgar score at 1 minute at 92.7% and at 5 minutes at 99.5% of seropositive pregnant women.

Conclusion

This study showed that vaginal delivery was the most common mode of delivery, particularly in HIV-positive women. Full-term deliveries were the most common. With an average weight of 3124.14 g for infected mothers, 65.1% of

infants of satisfactory weight were between 2500 and 3500g. Fetal condition was characterized by a good Apgar score at first minute and fifth at birth. The choice of feeding was exclusive breastfeeding.

References

1. Spectrum. Prevalence fin 2019-2020.
2. Coutoudis A, Pillay K, Spooner E, Kuhn L, Coovadia HM. Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: A prospective cohort study. *South African Vitamin A Study Group. Lancet.* 1999;354:471–476.
3. Asbjornsdottir KH, Slyker JA, Weiss NS. Breastfeeding is associated with decreased pneumonia incidence among HIV-exposed, uninfected Kenyan infants. *AIDS.* 2013;27:2809–2815.
4. Khuong-Josses MA, Khelil N, Guillaume AS, Ekoukou D. Infection à VIH et grossesse: Etude rétrospective de 124 cas. *Pat.* 2002;50:544-546.
5. Apgar V. Une proposition pour une nouvelle méthode d'évaluation du nouveau-né. *Current Resustation Anesthesia Analgesia.* 1953;32(4):625-660.
6. ONU-Habitat. Cote d'Ivoire: profil urbain d'Abidjan, programme des Nations Unies pour les établissements humains, 2012, 36 p.
7. PNLs. Document de politique, Normes et Protocoles des services de dépistage, 2016.
8. Bagayoko. Evaluation de la prise en charge de la femme enceinte VIH positif à HGT. Thèse de médecine à Université de Bamako, Mali, 2004, 48p.
9. Diouf JB, Diallo D, Sylla A, Mbaye N, Ouattara B, Ndiaye O. Devenir sérologique et nutritionnel des nourrissons-nés de mères séropositives suivis dans l'option B+ à Guédiawaye au Sénégal. *Pan African Medical Journal.* 2016;25:224.
10. Diop A. Transmission de la mère à l'enfant du VIH au centre de santé Roi Baudouin. In: XXIème Journées du Département de Chirurgie et Spécialités chirurgicales. DakaAAr 5 et 6 juillet, 2007.
11. Traoré SO, Berthé B, Konaté I, Camara D, Samaké A, Traoré MA *et al.* Dépistage du VIH en salle d'accouchement à la maternité du Centre de Santé de Référence de la commune V (Bamako). *Revue Malienne d'Infectiologie Microbiologie.* 2019;13(1):34-40.
12. Effoh D, Koffi A, Adjobi R, Koffi SV. Séroprévalence, prise en charge et pronostics foetal de l'infection à VIH au cours de grossesse au CHU de Cocody. *EDUCI. Revision International Science medecin.* 2018;20(3):223-228.
13. Millogo-Traoré F, Lankoandé J, Ouoba R. Prévention de la transmission mère-enfant du VIH dans le District Sanitaire de Kossodo (Burkina Faso). *Revue Médicale de Bruxelles.* 2008;29:153-158.
14. Essomba NE, Adiogo D, Lehman GP, Copieters Y. Facteurs prédictifs de naissance d'un nouveau-né séronégatif issu d'une mère séropositive au VIH à Douala. *Health Sciences and Diseases.* 2018;19(1):31-33.
15. Jou. Les petits poids de naissance nés de mères séropositives au VIH dans le service de gynécologie et d'obstétrique de l'hôpital Gabriel Touré. Thèse de médecine à l'Université de Bamako, Mali, 2009, 39p.
16. Kamenga M, Manzila T, Behets F, Oxtoby M, Brown C, Sulu M, *et al.* International Conference of AIDS Registered, 1991.