

Preventing vertical HIV virus transmission: hospital care assessment

Prevenção da transmissão vertical do vírus HIV: avaliação da assistência hospitalar
Prevención de la transmisión vertical del virus del VIH: evaluación de la asistencia hospitalaria

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ABSTRACT

Objectives: assess the implementation of actions to prevent vertical transmission of HIV. **Methods:** a retrospective cohort study conducted in two maternity hospitals in the city of Montes Claros, State of Minas Gerais. All women admitted for childbirth diagnosed with HIV and their respective newborns were included from 2014 to 2017. Data were collected from medical records and analyzed descriptively. **Results:** population consisted of 46 pairs of mothers and newborns. Management was considered inadequate in 30 cases of parturient/postpartum women (65.2%) and 14 cases of newborns (30.4%). The main reasons for inadequate maternal management were lack of pharmacological inhibition of lactation (53.3%) and counseling/consent for HIV testing (43.3%). For newborns, late onset of first dose of Zidovudine (50.0%) and no prescription of Nevirapine (28.6%). **Conclusions:** important prevention opportunities were missed, pointing to the need for improved care. **Descriptors:** Infectious Disease Transmission, Vertical; HIV; Prevention and Control; Health Services Research; Hospitals.

RESUMO

Objetivos: avaliar a implementação das ações de prevenção da transmissão vertical do HIV. **Métodos:** estudo de coorte retrospectivo, realizado em duas maternidades de Montes Claros, Minas Gerais. Foram incluídas todas as mulheres admitidas para o parto com diagnóstico de HIV e seus respectivos recém-nascidos, nos anos de 2014 a 2017. Os dados foram coletados de prontuários e analisados de forma descritiva. **Resultados:** a população foi composta por 46 pares de mães e recém-nascidos. O manejo foi considerado inadequado em 30 casos de parturientes/puérperas (65,2 %) e em 14 casos de recém-nascidos (30,4%). Os principais motivos para a inadequação do manejo materno foram: ausência da inibição farmacológica da lactação (53,3%) e do aconselhamento/consentimento na realização do exame anti-HIV (43,3%). Para os recém-nascidos, início tardio da primeira dose da Zidovudina (50,0%) e não prescrição da Nevirapina (28,6%). **Conclusões:** oportunidades importantes de prevenção foram perdidas, apontando para a necessidade de melhoria da assistência. **Descritores:** Transmissão Vertical de Doença Infecciosa; HIV; Prevenção e Controle; Avaliação de Serviços de Saúde; Hospitais.

RESUMEN

Objetivos: evaluar la implementación de acciones para prevenir la transmisión vertical del VIH. **Métodos:** estudio de cohorte retrospectivo realizado en dos hospitales de maternidad en la ciudad de Montes Claros, estado de Minas Gerais. Todas las mujeres ingresadas para el parto diagnosticadas con VIH y sus respectivos recién nacidos se incluyeron entre 2014 y 2017. Los datos se recopilaron de los registros médicos y se analizaron descriptivamente. **Resultados:** la población consistió en 46 pares de madres y recién nacidos. El manejo se consideró inadecuado en 30 casos de mujeres parturientas/posparto (65,2%) y 14 casos de recién nacidos (30,4%). Las razones principales para el manejo materno inadecuado fueron: falta de inhibición farmacológica de lactancia (53,3%) y asesoramiento/consentimiento para la prueba del VIH (43,3%). Para los recién nacidos, inicio tardío de la primera dosis de zidovudina (50,0%) y sin prescripción de nevirapina (28,6%). **Conclusiones:** se perdieron importantes oportunidades de prevención, lo que indica la necesidad de una mejor atención. **Descriptor:** Transmisión Vertical de Enfermedad Infecciosa; VIH; Prevención y Control; Investigación sobre Servicios de Salud; Hospitales.

INTRODUCTION

Sexually transmitted infections (STIs) have a major impact on global public health. In this setting, the spread of Human Immunodeficiency Virus (HIV) infection stands out due to its infectious capacity, its biological complexity, deleterious repercussion on the immune system of the affected, difficulty in control and treatment, social stigma, and its high cost for health care⁽¹⁻²⁾.

Due to its diversity of forms of transmission (blood, sexual and vertical) and the sociocultural and epidemiological changes that have occurred in recent decades, HIV infection has indiscriminately affected the world population, with a major impact on women's health. In Brazil, this phenomenon, called feminization of the epidemic, caused a change in the infection profile from a ratio of 28:1 (men:women) in 1985 to less than 3:1, currently⁽³⁻⁴⁾.

Feminization, coupled with the increased prevalence of infection in people of reproductive age, has led to increased rates of mother-to-child transmission of the virus, also called vertical transmission (VT). Considered as the main form of HIV infection in children, VT can occur during pregnancy, childbirth or breastfeeding, with a higher risk of transmission during labor and delivery^(4,5).

In Brazil, from 2000 to June 2018, 116,292 HIV-infected pregnant women were reported, 38.6% of them living in the Southeast region. In the last ten years there has been a 21.7% increase in case detection rate in pregnant women in the country and, at the same time, a downward trend in cases of virus VT. The explanation for these facts is based on the increase in prenatal diagnosis and consequent improvement in the prevention of VT of HIV⁽³⁾.

Early initiation of combination antiretroviral therapy (cART) for infected pregnant women associated with elective caesarean section, perinatal drug prophylaxis and breastfeeding suppression is the best combination for reducing VT⁽⁶⁻⁸⁾. These measures are recommended and made available by Brazil's MoH. When recommendations are followed, VT reaches rates of 1% to 2%^(4,9).

Despite evidence of the effectiveness of VT of HIV prophylaxis measures and all government investments already made in projects, programs and campaigns, the elimination of this problem remains a challenge for Brazil's health policies. Brazil is among the countries that have not yet reached the Pan American Health Organization (PAHO) and World Health Organization (WHO) target to reduce virus VT to less than two cases for every 100 infected mothers⁽¹⁰⁻¹³⁾.

According to Domingues et al.⁽¹⁴⁾, cases of VT continue to occur in the country due to failures in various sectors and may involve both health professionals and their respective services and managers as well as the users themselves. Therefore, knowing the local reality is the first step, from the identification of the faults and actors involved, to assess the problematic situations and to propose ways to solve them.

Given the epidemiological scenario presented and considering that VT of HIV remains a public health problem despite its preventable character, we were motivated to conduct this study.

OBJECTIVES

To assess the implementation of actions to prevent VT of HIV in two maternity hospitals in the city of Montes Claros, State of Minas Gerais.

METHODS

Ethical aspects

The study was approved by the Research Ethics Committee of the *Universidade Federal de São Paulo*. It meets the ethical aspects defined by the Brazilian National Health Board (CNS – *Conselho Nacional de Saúde*) through Resolution 466/2012 that regulates the research involving human beings.

Design, place and period of study

This is an observational retrospective cohort study guided by STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist tool⁽¹⁵⁾.

It was performed at the maternity hospitals of the two largest hospitals in the city of Montes Claros, based in the northern region of Minas Gerais. Both are affiliated to the Brazilian Unified Health System (*Sistema Único de Saúde*). They serve as a reference for high-risk pregnant women and have the title of Safe Motherhood, in addition to being accredited to the Child-Friendly Hospital initiative (HAC - *Hospital Amigo da Criança*). Together they attend a mean of 540 deliveries per month and also perform academic teaching and research activities linked to Undergraduate and Graduate Higher Education Institutions, including residency in gynecology/obstetrics and pediatrics. The data collected refer to the period from 2014 to 2017.

Population and inclusion criteria

The study population was composed of the universe of women admitted to attend childbirth in the referred maternity hospitals from 2014 to 2017 and their respective newborns (NB).

Eligible cases were those whose women were identified with a diagnosis of HIV in pregnancy, childbirth or postpartum who had their live births delivered. As the prevalence of HIV infection in pregnant women is low, it was decided to analyze all cases.

Study protocol

Data were collected from medical records of women and their NB. Information not found in medical records was sought in the SINAN declarations of live births and reporting forms (HIV in pregnant women and exposed children). The tool used was a form adapted from the questionnaire adopted by Macêdo⁽¹⁶⁾.

The variables of interest for the analysis of care management were extracted from care protocols of Brazil's MoH and include information on prenatal care, delivery and postpartum care, as well as on NBs, as well as maternal characteristics.

The collected data were entered twice using a database created in the Epidata, version 3.0 program, which was later corrected and transferred to the SPSS, version 19.0 program, where the data were analyzed descriptively.

Analysis of results, and statistics

For the description of qualitative variables, the statistics presented were absolute frequencies (n) and relative frequencies

(%). For the description of quantitative variables, the mean as central measure and standard deviation, minimum and maximum to indicate the variability were presented.

In order to define the adequacy of hospital management of parturient/postpartum women and NBs exposed, the implementation of prophylaxis measures recommended by the MoH was used as gold standard. They are available in the Clinical Protocol and Therapeutic Guidelines in force at the time of the occurrence of the researched cases^(2,4,17), namely: 1) Performing the rapid test (RT) for HIV on admission for delivery, when necessary, i.e., for those pregnant women without previous diagnosis or without proof of it; 2) Counseling and consent of the pregnant woman to perform the RT; 3) Intravenous (IV) Zidovudine (AZT) administration during labor and delivery; 4) AZT EV infusion time for at least 3 hours; 5) Acceptable choice of delivery; 6) Pharmacological inhibition of lactation; 7) Antiretroviral therapy (ARV) administration in the NB (oral AZT and Nevirapine, when indicated); 8) Initiation of oral AZT in the first 4 hours of life and Nevirapine in the first 48 hours of life; 9) Report of women diagnosed in the maternity ward and of exposed children; 10) Referral of the binomial mother and child for outpatient follow-up.

It is noteworthy that the management was considered adequate only when all the recommended conducts were performed and properly registered in medical records. From this, the hospital management of both women and NBs was analyzed in relation to the independent variables of interest.

RESULTS

During the study period, there were 25,824 deliveries in the maternity hospitals surveyed, 7,680 (29.7%) in maternity A and 18,144 in maternity B (70.3%). Among these, 46 cases of women admitted for childbirth who were diagnosed with HIV were identified, 42 cases in maternity A (91.3%) and four cases in maternity B (8.7%). All deliveries resulted in live births, making up a population of 46 mother-child binomials.

Regarding sociodemographic data, most of them were married or in a stable union (65.2%), non-white (97.7%), with eight years or less of completed studies (54.8%). without paid occupation (61.3%), coming from Montes Claros (71.7%) and the urban area (89.1%). The mean age was 30.2 years, with a minimum of 19 and a maximum of 48 years (SD=7.1) and a predominant age group of 25 years or older (71.7%) (Data not shown in table).

Most women were multiparous (73.9%), with a mean of three pregnancies (SD=1.8) and progressing to at least one abortion in 31.6% of cases. Almost all had prenatal care (95.7%) and more than half had six or more visits (58.1%), with at least one and at most ten (mean of 5.6). Had a diagnosis of HIV infection before (54.3%) or during pregnancy (32.6%). Regarding VT prophylaxis, 87.2% of pregnant women received ARV treatment (Data not shown in table).

At admission for delivery, most women had full-term pregnancies (84.8%), with a gestational age (GA) of at least 27 and a maximum of 41 weeks (mean of 38; SD=2.2), less than four cm of cervical dilation (67.4%), intact amniotic sac (68.2%) and, when rotated, mean rupture time of five hours (SD=3.9) (Data not shown in table).

Table 1-Hospital management of pregnant women/parturient/mothers diagnosed with HIV and newborns exposed to infection in two maternity hospitals in Montes Claros, Minas Gerais, Brazil, 2014 to 2017

Variables	n *	%
Rapid HIV test (RT) (n=46)		
Yes	16	34.7
No	20	65.3
RT time (n=16)		
At pre-delivery	15	93.8
At postpartum	1	6.2
RT counseling and consent registry (n=16)		
Yes	3	18.8
No	13	81.2
Examination of viral load available at delivery (n=40)		
Yes	25	62.5
No	15	37.5
Viral Load Value (n=25)		
Undetectable	11	44.0
Less than 1,000 copies	8	32.0
Equal or greater than 1,000 copies	6	24.0
Use of intravenous AZT in labor/delivery (n=46)		
Yes	40	87.0
No	6	13.0
AZT infusion time until delivery (n=40)		
Less than 3 hours	7	17.5
3 hours or more	33	82.5
Type of delivery (n=46)		
Vaginal	11	23.9
Cesarean	35	76.1
Indication for cesarean section (n=35)		
HIV elective	24	68.6
Labor in women HIV +	4	11.4
Other obstetric indication	7	20.0
Performance of mechanical inhibition of lactation (n=45)		
Yes	41	91.1
No	4	8.9
Performance of chemical inhibition of lactation (n=44)		
Yes	30	68.2
No	14	31.8
Referenced postpartum (n=46)		
Yes	44	95.6
No	2	4.4
Reported cases (HIV in pregnant women) (n=46)		
Yes	45	97.8
No	1	2.2
Prescription drug for NB (n=46)		
Oral AZT	20	43.5
Oral AZT + Nevirapine	26	56.5
Beginning of oral AZT administration (n=44)		
Up to 4 hours of life	37	84.1
4 hours or more of life	7	15.9
Beginning of Nevirapine administration (n=26)		
Up to 48 hours of life	26	100.0
Reported Cases (HIV-exposed NB) (n=46)		
Yes	45	97.8
No	1	2.2
NB referenced (n=46)		
Yes	45	97.8
No	1	2.2

Note: *Valid data; RT: rapid test; AZT: Zidovudine; NB: newborns.

Regarding hospital care (Table 1), it is noteworthy that the rapid test was performed in less than half of women. Of these, only three were counseled and signed the consent form for the test, according to the medical records. Viral load screening was available in 62.5% of cases and undetectable in 44%.

All NBs used oral zidovudine and most started the medication less than four hours of life. Nevirapine, when used, was started less than 48 hours of age in all cases. Finally, mothers and children were mostly reported and referred for outpatient follow-up after discharge (Table 1).

Regarding the assessment of the management adopted at the hospital level (Table 2), it was found that there was a lower frequency of NB management failures when compared to the management of parturient/postpartum women. The main reasons identified for the inadequate management of women were: lack of pharmacological inhibition of lactation, lack of counseling and consent for HIV testing and IV AZT administration for less than 3 hours. Regarding the management of NBs, the late initiation of administration of oral AZT solution and the lack of prescription or unnecessary prescription of Nevirapine were highlighted (Table 2).

When relating the adequacy of hospital management to the other variables of interest, it was observed that maternal management prevailed as inadequate for most categories of variables analyzed, except for color/race and diagnosis of HIV during pregnancy.

The opposite was observed in relation to NB, where adequate management was more frequent for all categories of variables analyzed (Table 3).

DISCUSSION

The analysis of the sociodemographic profile of the investigated women corroborates findings from other studies and reinforces the theory of pauperization and internalization of the HIV epidemic^(3,18-20). The fact that the majority is married/cohabiting brings us to gender issues, still marked by factors that contribute to greater female vulnerability, such as the trust placed in a stable relationship and the male sexual imposition. This imposition usually excludes the possibility of condom use, especially in conjugal contexts⁽²⁰⁻²¹⁾.

Considering the limitations of prenatal care, also evidenced in this study, the moment of childbirth, the main object of this investigation, is seen as a second opportunity for diagnosis and intervention to reduce VT of HIV, especially in countries such as Brazil. Most births occur in a hospital setting⁽²²⁾.

In this study, all women not diagnosed or tested during pregnancy (n=6; 13.0%) underwent RT at admission for delivery, as

Table 2 - Reasons for inadequate hospital management of parturient/postpartum women diagnosed with HIV and exposed newborns, in two maternity hospitals in Montes Claros, Minas Gerais, Brazil, 2014 to 2017

Inadequate Management	n*	%
Parturient/postpartum women (n=30; 65.2%)		
Insufficient IV AZT time during labor/delivery (<3hs)	7	23.3
IV AZT prophylaxis during unperformed labor/delivery	6	20.0
Pharmacological inhibition of lactation not performed	16	53.3
Counseling not accomplished/registered	13	43.3
Consent to RT unsolicited/registered HIV	13	43.3
Postpartum rapid HIV test	1	3.3
Inadequate type of delivery	1	3.3
Case not referred for outpatient follow-up	1	3.3
Casereported	1	3.3
Newborns (n=14; 30.4%)		
Late start of AZT (> 4 hrs)	7	50.0
Nevirapine prophylaxis required but not performed	4	28.6
Nevirapine prophylaxis performed, but unnecessary	2	14.3
Case not referred for outpatient follow-up	1	7.1
Case not reported	1	7.1

Note: *Valid data; IV: Intravenous; AZT: Zidovudine; RT: rapid test.

Table 3 -Classification of hospital management according to maternal characteristics, time of HIV diagnosis, prenatal care, viral load, cervical dilation, integrity of amniotic membranes and type of delivery, 2014 to 2017

Variables	Maternal Management		NB	
	Adequate n*(%)	Inadequate n*(%)	Adequate n*(%)	Inadequate n*(%)
Maternal age (n=46)				
<25 years	6(46.2)	7(53.8)	9(69.2)	4(30.8)
≥25 years	10(30.3)	23(69.7)	23(69.7)	10(30.3)
Marital status (n=46)				
Married	9(30.0)	21(70.0)	21(70.0)	9(30.0)
Single	7(43.8)	9(56.2)	11(68.8)	5(31.2)
Education (n=42)				
> 8 years	7(30.4)	16(69.6)	13(68.4)	6(31.6)
≤8years	7(36.8)	12(63.2)	17(73.9)	6(26.1)
Race/Color (n=43)				
White	1(100.0)	0 (0.0)	1(100.0)	0(0.0)
Non-white	13(31.0)	29(69.0)	29(69.0)	13(31.0)
Diagnosis time (n=46)				
Before pregnancy	6(24.0)	19(76.0)	18(72.0)	7(28.0)
During pregnancy	10(66.7)	5(33.3)	11(73.3)	4(26.7)
Birth/postpartum	0(100.0)	6(100.0)	3(50.0)	3(50.0)
Prenatal care(n=46)				
Yes	16(36.4)	28(63.6)	30(68.2)	14(31.8)
No	0(0.0)	2(100.0)	2(100.0)	0(0.0)
Examination available viral load (n=40)				
Yes	12(48.0)	13(52.0)	17(68.0)	6(32.0)
No	4(26.7)	11(73.3)	12(80.0)	3(20.0)
Cervical dilation (n=44)				
<4 cm	13(43.3)	17(56.7)	18(60.0)	12(40.0)
4to 6 cm	2(22.2)	7(77.8)	9(100.0)	0(0.0)
7-10 cm	1(20.0)	4(80.0)	4(80.0)	1(20.0)
Water bag (n=45)				
Full	14(45.2)	17(54.8)	21(67.7)	10(32.3)
Route	2(14.3)	12(85.7)	10(71.4)	4(28.6)
Type of delivery (n=46)				
Vaginal	3(27.3)	8(72.7)	8(72.7)	3(27.3)
Cesarean	13(37.1)	22(62.9)	24(68.6)	11(31.4)

Note: *Valid data.

standardized, except for one, whose test was only performed at postpartum, although hospitalization occurred at the beginning of labor. Examination was also performed, "unnecessarily", in 10 women who already had a previous diagnosis of infection (21.7%), probably due to the lack of proof at the time of admission.

It is noteworthy that, in any situation of HIV testing, women should receive pre- and post-test counseling from trained health professionals. Examination should always be performed upon consent and record in the medical record^(2,4). This was observed only in three cases (18.8%) in the maternity hospitals surveyed. A study carried out by Passos et al.⁽²³⁾, which investigated counseling in five HACs in the city of Rio de Janeiro, found a 25% prevalence of counseling. In the city of Recife, the result was worse, with only 7.7% of parturient women being advised during testing⁽²⁴⁾. The low prevalence in our study raises criticisms regarding the qualification and assessment of nursing care, since performing the RT is a function assigned to these professionals in both hospitals.

Factors associated with the risk of VT include maternal viral load (VL). The value is used as a reference for the definition of conducts, as a prescription for ARV regimen for pregnant women and parturient women, and also for the definition of the type of delivery^(4,25). Despite its importance, information about the examination was not found in 37.5% of the medical records.

About prophylaxis during labor, it was found that among the six women (13.0%) who did not receive IVAZT, three cases (50%) are justified by admission already in expulsive period. This is not true for the others, as two of them were at the beginning of the active phase of labor when admitted and the other was only diagnosed late in the postpartum, despite being less than 4 cm dilated at admission. It is noteworthy that there was a serious operational failure in one of the above cases, in which AZT was not released by the pharmacy in time to be administered, as recorded in the medical record.

Another shortcoming observed is the AZT infusion time, which is recommended for a minimum of three hours, which is the period necessary to reach the appropriate intracellular drug concentration, which should be maintained until the umbilical cord is ligated^(7,26). Among the seven parturient women (18.5%) who received AZT for less than three hours, only one of them admitted to advanced labor (9 cm of cervical dilation). In addition, all had a diagnosis of HIV prior to hospitalization, five of them undergoing cesarean section for this reason, which theoretically makes it inadmissible not to follow all recommendations.

It is noteworthy that the admission of women in advanced labor has been described as one of the main obstacles linked to the failure to administer AZT before and during delivery. This period could be alleviated with the counseling of pregnant women during prenatal care about the need to seek immediate care in the face of signs of labor or loss of amniotic fluid. This would prevent a lack of timely intervention⁽²⁷⁾.

Regarding the type of delivery, our findings corroborate other studies in which the majority of deliveries in women with HIV (35; 76.1%) were cesarean^(18,25-28).

Importantly, cesarean section should not be seen as a rule. Vaginal delivery can also be safely performed in HIV-positive women as long as clinical and obstetric conditions are observed, in addition to the value of VL, which should be undetectable or less than 1,000 copies/m during last trimester examination^(4,18,25).

In this study, according to available VL parameters, it was found that ten women (33.3%) who underwent cesarean section could have evolved to normal delivery. However, considering that the type of delivery in these situations does not change the risk of VT and that this is a decision that can be discussed between the obstetrician and the pregnant woman^(2,4,29), it was decided not to assess the adequacy of the type of delivery when it occurred operatively.

On the other hand, as already demonstrated the benefit of elective cesarean section or early labor when maternal viral load is unknown or greater than 1,000 copies/ml^(2,3,7), it was concluded that, among the eleven vaginal deliveries, two (18.2%) had indication for cesarean section. However, only one of the cases considered the type of delivery inadequate, since the other parturient woman arrived in the expulsive period, although she already had a previous diagnosis of the infection.

After delivery, a new stage of interventions begins, now aimed at NBs. As in the management of parturient women, failures were also observed in the administration of ARV medication in NBs, including some considered inadmissible as late administration of oral AZT in six children (11.1%), whose mothers were already known to be HIV-positive. Another case was found, however, the delay occurred as a result of the late diagnosis of the woman (postpartum), another previously reported failure. According to the recommendations, the first dose of the drug should be administered already in the delivery room after the first NB care, or at the latest 4 hours after birth⁽²⁵⁻²⁶⁾.

Nevirapine use should be indicated in combination with AZT when the risk of VT is higher. That is, for all NBs, 35 weeks or older, born to mothers who did not use ARV medication during pregnancy or who did not achieve sustained VL suppression in the last trimester⁽³⁰⁻³²⁾. This recommendation was based on a clinical trial (Protocol 1043) that showed a significant reduction in VT in the two-drug versus one-drug regimen group⁽³³⁾.

In the present study, four cases were identified in which Nevirapine was not prescribed, although indicated. Inverse situation was also verified, where Nevirapine was prescribed without indication, denouncing, once again, the lack of professional preparation.

The last step for intervention for VT of HIV prophylaxis, as important as the previous ones, concerns breastfeeding that should be contraindicated regardless of maternal plasma VL, since mother's use of ARV is not effective to control elimination of HIV through breast milk, therefore not guaranteed protection⁽³⁴⁾. Thus, it is recommended that every woman living with HIV/AIDS be advised not to breastfeed, and informed about the right to receive infant formula for at least six months^(4,35-36).

In addition to counseling on non-breastfeeding, inhibition of lactation should be initiated soon after delivery, preferably by administering carbegoline, which is more effective and convenient than other medications. On the other hand, mechanical inhibition through breast bandaging, due to its questionable effectiveness and low adhesion, mainly due to the discomfort and embarrassment caused, should only be performed in the absence of pharmacological lactation inhibitors^(2,35-36).

It is noteworthy that the purchase of pharmacological inhibitors, such as carbegoline, is reimbursed to hospitals by the government. Thus, it is up to the services to organize themselves to offer the

medication to women before hospital discharge, which did not occur in many situations in this study (31.8%). There was also a resistance to abandon the mechanical inhibition method of lactation, since, even though receiving pharmacological inhibition, many women also had their breasts bandaged.

Regarding reporting and referral of cases, there was a greater awareness and attention of professionals regarding the compliance with these steps.

In the present study, prophylaxis measures were adequate and covered all maternal care stages in only 34.8% of the cases analyzed. Less disastrous results were found in relation to NB management, with 69.6% adequacy. However, when analyzing all steps together, including NB management, the frequency of adequacy falls to 23.9%. Weaknesses have been demonstrated along the cascade of interventions that can compromise a child's life, with repercussions on the physical, emotional and social dimensions.

The highest frequency of inadequate maternal management was observed in all categories of sociodemographic variables analyzed, except for skin color, where failures were observed only in non-white women. This vulnerability related to skin color is also evident in other studies by identifying that these women, in addition to being proportionally more infected, are also less favored, not only in the diagnosis of infection but also in the adoption of prophylaxis measures in all care stages^(19,37).

It was noteworthy that the highest concentration of inadequate management occurred among women diagnosed with HIV before pregnancy. This group was expected to benefit most, as the effectiveness of prophylaxis measures is based on early knowledge of the infection^(2,4).

Among prenatal women, hospital management was also inadequate in most cases. In the context of women living with the HIV virus, prenatal care is expected to reflect on the quality of hospital care, especially through awareness and counseling of pregnant women regarding VT prophylaxis and its stages, making them more aware, attentive and active in the process.

As expected, it was observed that, among women admitted with lower cervical dilation, the frequency of adequacy of management was higher and failures increased as cervical dilation was also higher at admission. This fact reiterates that women's entry into maternity at an early stage of labor contributes to reducing the occurrence of failures through the longer time available for intervention, especially in the maternal stages of prophylaxis.

Although the highest frequency of inadequate management occurred regardless of the characteristic of the amniotic pouch and type of delivery, it was found that women with intact pouch and those who underwent cesarean section lost less chances of prevention, certainly due to the higher occurrence of scheduled surgeries in these cases.

Given the situations presented, it can be seen that opportunities for prevention were missed and at one of the most risky times for VT, which could be avoided, if all recommended measures are met.

Several studies conducted by Brazil, with similar objectives to this one, unfortunately corroborate our results^(19,38-40). An international study, conducted in the United States in 15 US jurisdictions from 2005 to 2008, also identified the loss of at least one prevention opportunity in half of all births during the period⁽⁴¹⁾.

If there is interest in national health policies, availability of inputs and care protocols that guide the actions of professionals, why do we continue to fail in the goal of eliminating VT? This is a question that has been attended by several studies and whose answers go through several hypotheses. Among them is the lack of management of services and training of professionals involved in care, from prenatal care to hospital care at birth, as well as issues related to women's individual and social vulnerability^(10-14,19,39-40).

Cuba's success is proof that even in countries with limited financial resources, the elimination of VT of HIV can become a reality as long as investments are made. Investments not only in coverage but also in the quality of services, in addition to maintaining a well-organized and effective national surveillance system⁽⁴²⁾.

Study limitations

Secondary data searches are subject to the quality of records that are often deficient due to incomplete or inadequate information completion. In addition, consideration should be given to the possibility that procedures were performed and not registered in the medical records, which also limits the study's conclusions.

Contributions to nursing, health, and public policy

From the reality found, the professionals involved in care can reflect on their role and co-responsibility in the occurrence of such a serious and preventable outcome. For managers, the findings may contribute to raising awareness about the social responsibility of the titles of "Safe Motherhood" and "HAC". These titles are attributed to the investigated institutions and, consequently, to the decision-making process in search of care that is truly compatible with the company's law.

CONCLUSIONS

The results of this study indicated inadequacies in care management of the studied population, indicating failures in following the guidelines and recommendations for VT of HIV prophylaxis in force in the country, ranging from prenatal care to delivery and NB care.

The analysis of the contexts in which hospital interventions were not timely or adequately performed indicates that most of the occurrences could have been avoided. They are lack of counseling, failure to administer AZT at delivery, low utilization of pharmacological inhibition of lactation, delayed release and or administration of medications. All the faults indicated indicate weaknesses in the organization of services and management of mother-child binomials, compromising the effectiveness of preventive actions.

Such facts are considered serious, especially when they occur in teaching and referral hospitals for high-risk pregnant women care and, therefore, need to have their causes investigated and promptly corrected.

Investing in work process management and continuing education for care professionals, including training in counseling and clinical management, is believed to be one of the pathways that, in the current scenario, best achieves the goal of eliminating VT of HIV.

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