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# Use of rapid test for the diagnosis of human immunodeficiency virus (HIV) infection in parturients

## *Uso de teste rápido para diagnóstico da infecção pelo vírus da imunodeficiência humana (HIV) em parturientes*

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**Abstract**

The diagnosis of human immunodeficiency virus (HIV) in parturient women is used to prevent or change the course of HIV perinatal transmission through the zidovudine prophylaxis regimen. The aims of this study were to determine the prevalence of the HIV infection using the rapid test, to evaluate its acceptance for the diagnosis of HIV infection, and to determine the risk factors for HIV infection in parturients. Interview and a rapid test for anti-HIV were carried out on 4,341 parturients attended at two main public maternities (Maternity of the University Hospital and Municipal Maternity "Lucilla Ballalai"), in the city of Londrina, Paraná, Brazil, from May, 2000, to September, 2001. The rapid test was positive in 23 (0.52%) parturients evaluated. Of them, the seropositivity in the conventional (screening and confirmatory) tests was obtained in 19 (0.44%; 95% CI: 0.27 – 0.70). The rate of the rapid test acceptance was 99.7%. Among HIV-infected. parturient it was found higher frequency (52.6%) of intravenous drug-user sexual partner (Odds ratio 51.63, 95% CI: 18.67-143.51, p< 0.0001) when compared with HIV-uninfected parturients, and also with a diagnosed seropositive partner (42.1%) when compared with HIV-uninfected parturients (Odds ratio 1011.88, 95% CI: 201.87-5766.26, p<0.0001). However, 15.8% of the HIV-infected parturient denied the existence of any risk factor for HIV infection. The results of this study emphasize the useful of the rapid test to diagnose the HIV infection in all parturient.
**Keywords:** HIV infection- Rapid test - Parturient women.

***Resumo***

*O diagnóstico da infecção pelo vírus da imunodeficiência humana (VIH) em parturientes é utilizado para prevenir ou alterar o curso da transmissão perinatal do VIH, por meio da administração profilática do antirretroviral zidovudina. Os objetivos do presente estudo foram determinar a prevalência da infecção pelo VIH em parturientes com a utilização do teste rápido, avaliar a aceitação do teste rápido para o diagnóstico da infecção pelo VIH e determinar os fatores de risco da infecção pelo VIH em parturientes. Foram realizados o teste rápido para o VIH e entrevista em 4.341 parturientes atendidas nas duas principais maternidades públicas (Maternidade do Hospital Universitário e Maternidade Municipal "Lucilla Ballalai"), na cidade de Londrina (Paraná, Brasil), no período de maio de 2000 a setembro de 2001. O teste rápido foi positivo em 23 (0,52%) parturientes avaliadas. Dessas, os testes sorológicos convencionais (de triagem e confirmatórios) foram positivos em 19 (0,44%; 95% IC: 0,27-0,70). A taxa de aceitação do teste rápido foi de 99,7%. Entre as parturientes infectadas pelo VIH, observou-se maior frequência (52,6%) de parceiro sexual usuário de droga injetável (Odds ratio 51,63; 95% IC: 18,67-143,51; p< 0,0001) quando comparada à de parturientes não-infectadas pelo VIH, e também com parceiro sabidamente soropositivo para o VIH (42,1%) quando comparada à de parturientes não-infectadas (Odds ratio 1.011,88; 95% IC: 201,87-5.766,26; p< 0,0001). Contudo, 15,8% das parturientes infectadas pelo VIH negaram a existência de qualquer fator de risco para a infecção pelo VIH. Os resultados deste estudo ressaltam a importância da realização do teste rápido para o diagnóstico da infecção pelo VIH em todas as parturientes.*
***Palavras-chave**: Vírus da Imunodeficiência Humana – Teste rápido – Parturientes.*

## INTRODUCTION

Since the description of the first case of AIDS, in 1980, it has been observed a worldwide progressive increase of the number of people infected with the human immunodeficiency virus (HIV). Despite the changes in the characteristics of the HIV-1-infected individuals and the absence of the group risks for HIV transmission, unfortunately a great number of women have unprotected sexual activities, and are considered to be at high risk for HIV infection. As a consequence of the increase in the incidence of HIV-infected women, a great number of children have been infected with the HIV through the vertical transmission.[1]

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HIV-1 can be transmitted from an infected woman to her fetus or newborn during pregnancy, during labor and delivery, and during the postpartum period through breastfeeding. Prospective studies have reported perinatal transmission rates ranging from 13% to 40%. Several maternal factors have been associated with an increase risk for transmission, including low CD4+ T-lymphocyte counts, high viral load, advanced HIV disease, the presence of p24 antigen in serum, placental membrane inflammation, intrapartum events resulting in increased exposure of fetus to maternal blood, breastfeeding, low vitamin A levels, premature rupture of membranes, and premature delivery [2]. Diagnosis of HIV-1 infection before, during pregnancy, or in the labor period, allows the use of strategies to prevent perinatal HIV transmission. Previous studies demonstrated that the administration of zidovudine (ZDV) to the HIV-infected women during pregnancy, labor, and delivery and also to their newborn reduced the risk for perinatal HIV transmission by approximately two thirds: 25.5% of infants born from mothers that did not receive ZDV regimen were infected, compared with 8.3% of those born from mothers that received ZVD prophylaxis regimen.[3,4,5]

In March, 1999, the National Coordination of Sexual Transmitted Disease (STD) and AIDS of the Health Ministry of Brazil determined the indication of the rapid test for the HIV infection diagnosis in pregnant, during the labor, without the previous diagnosis of HIV infection or AIDS during the prenatal period, and after the verbal consent of the pregnant [6]. Since May, 2000, the Health Municipal Secretariat of Londrina, located in southern of Brazil, offers the testing for the HIV diagnosis in pregnant, in all the peripheral health units of the city. However, since 1996, when the pregnant was attended in the University Hospital or in the Out-Clinic Clinic Hospital, both from the Londrina State University, the testing for HIV has been carried out routinely in the prenatal period. The maternity of the University Hospital is the one of the hospitals in Londrina which offers routinely the conventional screening serologic tests for anti-HIV; however, the results are known, at least, 48 hours after the infant was born.

Therefore, it is not uncommon a pregnant to be attended during the labor without her knowledge at her HIV serologic status, either because the serologic test was not assayed or the serologic result of the anti-HIV test was not available in the records of her prenatal care, presented at the moment of the maternity admission.

The immediate knowledge of the HIV infection status is required for emergency blood screening in parturient in order to prevent or alter the course of the perinatal HIV transmission. The diagnosis of HIV infection in pregnant allows the adoption of prophylactic measures that reduce the mother-to-child transmission of HIV [3]. With the evidences of the efficacy, the useful, and the acceptance of rapid tests for the HIV infection diagnosis in pregnant, these assays can be safety introduced in the routine care of these women in the maternities, supporting the indication of the antiretroviral prophylaxis treatment to the mother and/or her live-born infant, as soon as possible. The aims of this study were to determine the prevalence of the HIV infection using rapid test, to evaluate its acceptance for the diagnosis of HIV infection, and to determine the sociodemographic and epidemiological characteristics associated with the HIV infection in parturients attended in two public maternities of Londrina, PR, Brazil.

## SUBJECTS, MATERIAL AND METHODS

This study was conducted in the city of Londrina, located in the Northern region of Paraná State, in the Southern Brazil. It has 447,065 inhabitants [7], with 8,175 live-born infants, in 2000, and 7,156, in 2001. The University Hospital and the Municipal Maternity "Lucilla Ballalai" (MMLB) are the two most important public maternities in the region, and were responsible for 60% and 65% of the labors of the pregnant women from Londrina in 2000, and 2001, respectively.

A cross-sectional study was carried out in a population constituted of consecutively parturients attended in the maternity of University Hospital, in the period from May, 2000, to September, 2001, and in the MMLB, from November, 2000 to August, 2001. The sample size was statistically calculated among 4,208 parturients, with an estimated prevalence for HIV infection of 1.0%, according the prevalence among HIV-infected pregnant in Brazil [8], with an error of 0.3% and 95% confidence interval (95% CI). Parturient who had fetal death *in utero* were excluded.

### Anti-HIV Rapid and Conventional Serological Tests

Before the blood sample collection, the nurse's assistant explained to the parturient the reasons why the rapid test for anti-HIV should be performed, using the digital puncture, and the results could be obtained in few minutes. The parturient that already had shown positive results before or during the prenatal serological screenings, it was emphasized the necessity of the confirmatory result obtained the rapid test and conventional serological tests. The technical staff including the laboratorial technicians, the nurses, and the nurse's assistants from both maternities was trained by on of the researcher to assay the rapid test.

Samples from parturients were initially screened for anti-HIV antibodies by a rapid test, using a commercial available immunochromatographic test (Determine™, Abbott Laboratories, Wiesbaden, Delkenheim, Germany). With this test it was possible to detect the specific antibodies against the antigens gp41 from HIV-1 env, gp36 from HIV-2 env, and gp41 from HIV-1 O subtype, making possible the detection of antibodies against HIV-1, including O subtype, and HIV- 2. The sensitivity of this test ranges from 97.9% to 100%, and the specificity

ranges from 99.5% to 100% [9,10]. The parturients in whom the rapid test was positive were appropriately informed in a private room.

All the samples that showed positive result by the rapid test were repeatedly assayed by the rapid test and evaluated by the conventional serological tests for anti-HIV according to the Brazilian standard procedures [11] using two screening serological methods, the enzyme-linked immunosorbent assay (*ELISA, MUREX™*, Abbott Laboratories, Wiesbaden, Delkenheim, Germany) and the microparticle enzyme-linked immunoassay (MEIA, AXSYM™, Abbott Laboratories, Weisbaden, Delkenheim, Germany). After, the samples were assayed by the confirmatory tests of indirect immunofluorescence (IFI HIV-1, Fiocruz/Bio-Manguinhos, Rio de Janeiro, RJH, Brazil) or Western Blot (HIV-blot, Genelabs Laboratories). The results obtained by rapid test were communicated to the parturient by the technical staff when it was negative, and by the physicians when it was positive, who explained to the parturient the necessity to confirm the result and the introduction of the ZDV prophylaxis regimen, according to the standard procedures of the Health Ministry of Brazil.[6]

**Sociodemographic and Epidemiological Characteristics**

All the parturients answered the standard questionnaire, applied by the researcher in the nursery to obtain the personal data related to the prenatal care and risk factors associated with the HIV transmission. The data obtained from the HIV-1-infected parturient questionnaire were after confirmed in an outpatient consultation.

**Statistical Analysis**

A database consisting of the anti-HIV results and the information obtained by the questionnaire was set up using the EPI INFO software version 6.04d [12] to describe and to compare the sociodemographic and epidemiological variables. For the variables prenatal care, local of prenatal, and number of consultations, the chi-square and exact Fisher test were used. The variable age was analysed by the Kruskal-Wallis test. Differences were considered to be statistically significant when $p < 0.05$.

**Ethical Aspects**

The protocol was approved by the institutional Research Ethics Committees of both Londrina State University and MMLB. The parturients were informed in details about the research, and voluntary written consent was obtained from all the subjects enrolled. After the discharge of the maternity, the infants and the mothers were directed to an AIDS reference Outpatient Clinic of the city.

**RESULTS**

During the period evaluated, 4,590 parturients were enrolled in the study and the rapid test for anti-HIV antibodies was assayed in 4,341 (94.6%) of them. Of the 249 that were not included, 15/4590 parturient (0.3%) refused to be screened by the rapid test and did not answer the questionnaire, and 234 samples (5.1%) were excluded from the analysis by other reasons such as the early discharge, before the questionnaire to be applied (n=25, 0.5%), and due the temporary absence of the commercial kits of the rapid test in the MMLB, in the period from December, 2000 to January, 2001 (n=209, 4.5%).

**Anti-HIV Rapid and Conventional Serological Tests**

Among 4,341 parturients tested by the rapid test for anti-HIV, positive results were observed in 23 (0.52%). Of them, 19 parturients (0.44%, C.I.:95% 0.27-0.70) with repeatedly positive rapid test showed also positive results in the screening tests (ELISA and MEIA), and in the confirmatory tests (IFI and Western Blot) for the anti-HIV antibodies. False positive results were observed in the rapid test in four parturient that showed negative results in the ELISA, MEIA, and Western Blot tests. One of them showed negative result and three showed indeterminate result in the IFI test. The reasons of these false-positive results obtained by the rapid test were determined in two patients: one patient showed positive serologic tests for specific IgM antibodies against citomegalovirus (CMV), and the other showed reactivity to antinuclear antibodies (title 1:320) assayed by IFI with Hep2 cells. The results showed a specificity of the rapid test for anti-HIV of 99.6% (C.I.:95% 99.0-99.9%), predictive positive value of 82.6% (C.I.:95% 60.5-94.3%), and predictive negative value of 100.0% (C.I.:95% 99.6-100.0%). The sensitivity of the test was not possible to be determined because all the pregnant women with negative rapid test were not tested with conventional serological tests.

In the present study, three HIV-infected parturient were not evaluated to detect anti-HIV antibodies during the prenatal period. One parturient was not attended during the prenatal; other woman had only one sexual partner and was not evaluated during the prenatal because her husband showed a negative result for anti-HIV antibodies during a previous blood donation before the pregnancy, and the rapid test was considered unnecessary by her obstetric; in the third parturient, the diagnosis of HIV infection was not made during the prenatal period because she was received the serologic result, assayed during the first trimester of the pregnancy, with incorrect result (negative but actually the result was positive). In this case, during the puerperal period, the parturient informed her doctor that her husband had bisexual behaviour.

One parturient showed positive results in the rapid test and in the conventional tests (ELISA and MEIA), which was assayed two months after the discharge from the maternity, in serum samples collected during the labor and stored during a short period, when the commercial

rapid test was not available in the MMLB maternity. However, this patient changed her address to another city and it was not possible to confirm the result by the IFI or Western Blot.

**Sociodemographic and Epidemiological Characteristics**

The Table 1 shows the frequency of seropositivity for anti-HIV-1 antibodies tested by rapid test according to some sociodemographic characteristics of the pregnant evaluated. Significant differences were not observed when the variable age was analysed (p=0.1902). The age of the parturient HIV-infected ranged from 14.0 to 36.0 years. Among sixteen infected pregnant (84.2%), the age ranged from 20 and 39 years. The mean age was 26.5 years (± 5.9) and the median was 27.0 years. The age of the parturient HIV-uninfected ranged from 13.0 to 46.0 years and among 3,222 of them (74.5%), the age ranged from 20 and 39 years. The mean age was 25.0 years (± 6.6) and the median was 24.0 years.

**Table 1** - Frequency of seropositivity to anti-human immunodeficiency virus (HIV) antibodies tested by rapid test among the parturient attended at two public maternities from Londrina – PR - Brazil, during the period from May, 2000 to September, 2001, distributed according to the sociodemographic characteristics

| Characteristics | Anti-HIV** positive | Anti-HIV** negative | Total |
|---|---|---|---|
| **Age (years)*** | | | |
| Range | 14.0-36.0 | 13.0-46.0 | 13.0-46.0 |
| Mean ± SD | 26.5 ±5.9 | 25.0±6.6 | |
| Median | 27 0 | 24 0 | |
| **Education level*** n (%)** | | | |
| Illiterate | 2 (10.5) | 120 (2.9) | 122 (2.9) |
| 1th-4th grade (incomplete) | 4 (21.1) | 383 (9.2) | 387 (9.2) |
| 1th-4th grade (complete) | 7 (36.8) | 1,631 (38.9) | 1,638 (38.9) |
| 4th-8th grade (complete) | 4 (21.1) | 666 (15.7) | 670 (15.8) |
| Secondary/Higher | 2 (10 5) | 1 397 (33 3) | 1 399 (33 2) |
| Total | 19 (100.0) | 4,197 (100.0) | 4,216 (100.0) |

Notes: *p=0.1902; **rapid test for anti-HIV, immunocromatographic test (DetermineÔ, Abbott Laboratories, Wiesbaden, Delkenheim, Germany), detecting the specific antibodies against the antigens gp41 from HIV-1 env, gp36 from HIV-2 env, and gp41 from HIV-1 O subtype; *** p = 0.0221 (by Fisher's Exact test); 125 without records of the information in the questionnaire

Among the 4,216 parturients that the education level was known, it was observed that the education level was lower in the HIV-infected parturient compared with the HIV-uninfected (p = 0.0221).

Almost all the parturients (98.4%) received prenatal assistance, among them 85.6% had five or more consultations and 82.5% were monitored in basic units of health. These distributions did not differ among the HIV-infected ant HIV-uninfected parturient (p > 0.05).

Eight hundred and five parturients (19.2%) were not tested for the anti-HIV antibodies during the prenatal period; of them, 3 (0.4%) were HIV-infected as demonstrated lately. Therefore, excluding the parturients that reported not to known if the anti-HIV serologic tests were assayed during the prenatal period, the presence of the HIV-infection did not differ among the parturients that were assayed for anti-HIV antibodies compared with the parturient that were not assayed during the pregnancy (p = 0.7809) (TABLE 2).

The Table 3 shows the epidemiological characteristics associated with the HIV-1 transmission. The report of an intravenous drug user (IVDU) of a sexual partner (Odds ratio 51.63, 95% CI: 18.67-143.51), HIV seropositive sexual partner (Odds ratio 1011.88, 95% CI: 201.87-5766.26), and the occurrence of previous STD (Odds ratio 4.53, 95% CI: 1.40-13.69) was observed with more frequency among the HIV-infected parturient when compared with the HIV-uninfected parturient. The HIV-uninfected parturient did not report the presence of any risk factor with more frequency than the HIV-infected parturient (Odds ratio 0.06, 95% CI: 0.01-0.22).

Out of 19 HIV-infected parturients, 15 (78.9%) received antiretroviral prophylactic regimen during the

**Table 2 -** Distribution of the results of serological test for human immunodeficiency virus (HIV) antibodies assayed during the prenatal care and reported in the questionnaire and the occurrence of positive rapid test for HIV infection assayed at the intrapartum period, in the parturients attended at two maternities from Londrina – PR - Brazil

| Anti-HIV* serological test assayed in the prenatal care and reported in the questionnaire | Anti-HIV positive rapid test** | | Anti-HIV negative rapid test** | | Total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Done | 16 | 0.5 | 3,177 | 99.5 | 3,193 | 100.0 |
| Not done | 3 | 0.4 | 802 | 99.6 | 805 | 100.0 |
| Unknown | 0 | 0 0 | 205 | 100 0 | 205 | 100 0 |
| Total | 19 | 0 9 | 4 184 | 99 1 | 4 203 | 100 0 |

Notes : p = 0.7809 (by Fisher's Exact test, excluding the "unknown" category);* - 138 parturient without records of the information in the questionnaire; serological test for anti-HIV (ELISA and MEIA);** - rapid test for anti-HIV immunocromatography test (Determine™, Abbott Laboratories, Wiesbaden, Delkenheim, Germany), detecting the specific antibodies against the antigens gp41 from HIV-1 env, gp36 from HIV-2 env, and gp41 from HIV-1 O subtype.

Table 3 - Epidemiological characteristics associated with the human immunodeficiency virus (HIV) transmission evaluated in the parturients attended at two maternities from Londrina – PR - Brazil, according to the HIV serological status

| Epidemiological characteristics | Rapid test* Anti-HIV positive | | Rapid test* Anti-HIV negative | | Total n=4,198** | | p value*** | Odds ratio (95%CI) † |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | | |
| Intravenous drug user | 0 | 0.0 | 11 | 0.3 | 11 | 0.3 | ≅1.000 | 0.0(0.0-114.4) |
| Blood transfusion | 2 | 10.5 | 257 | 6.1 | 259 | 6.2 | 0.3293 | 1.74(0.0-8.21) |
| Multiple sexual partners | 2 | 10.5 | 407 | 9.7 | 409 | 9.7 | 0.7074 | 1.09(0.0-4.97) |
| Bisexual partner | 1 | 5.3 | 32 | 0.8 | 33 | 0.8 | 0.1395 | 7.20(0.0-54.37) |
| Blood transfusion receptor sexual partner | 1 | 5.3 | 130 | 3.1 | 131 | 3.1 | 0.4532 | 1.73(0.0-12.52) |
| Intravenous drug user sexual partner | 10 | 52.6 | 88 | 2.1 | 98 | 2.3 | < 0.0001 | 51.63(18.67-143.51) |
| HIV seropositive sexual partner | 8 | 42.1 | 3 | 0.1 | 11 | 0.3 | < 0.0001 | 1011.88(201.87-5766.26) |
| Previous STD‡ | 5 | 26.3 | 305 | 7.3 | 310 | 7.4 | 0.0104 | 4.53(1.40-13.69) |
| Absence of any risk factor investigated | 3 | 15.8 | 3,162 | 75.7 | 3,165 | 75.4 | < 0.0001 | 0.06(0.01-0.22) |

Notes: * - rapid test for anti-HIV immunocromatography test (Determine™, Abbott Laboratories, Wiesbaden, Delkenheim, Germany), detecting the specific antibodies against the antigens gp41 from HIV-1 env, gp36 from HIV-2 env, and gp41 from HIV-1 O subtype;** - 143 parturient without records of the information; *** - by Exact Fisher test; † - 95% confidence interval;‡ - Sexual Transmitted Diseases.

prenatal and 14 (73.7%), during the labor. The frequency of mother-to-child-transmission of HIV was 11.7% (2/17). In two infants the diagnosis of HIV infection was not possible; one parturient changed her address after the delivery and other infant died at her home, two months after the delivery. In both HIV-infected newborns, the delivery was normal and the infections may have occurred as a result of: a) one mother did not carry out a prenatal care and did not receive antiretroviral prophylaxis treatment, neither during the prenatal, nor during intrapartum period, because the delivery was expelled; however, her newborn, that also had congenital toxoplasmosis, received ZDV prophylaxis treatment since the first hours of life; b) other HIV-infected newborn received ZDV prophylaxis after the delivery and her mother received the ZDV prophylaxis regimen during the pregnancy and during the intrapartum period; this woman, however, had high HIV viral load during the pregnancy (170,000 copies/mL).

## DISCUSSION

The prevalence of HIV-infected parturients observed in this study was 0.44%, a rate in agreement with the prevalence reported by the Health Ministry of Brazil from 1998 and 2004. In Brazil, the project "Estudo Sentinela Brasil" carried out by the National Coordination of STD/AIDS of the Health Ministry, reported that the rates of seroprevalence of HIV-infected parturient were 1.17% in March,1997; 0.87% in October, 1997; 0.54% in March, 1998; 0.60% in October, 1998; 0.74% in March, 1999; and 0.81% in October, 1999 [8]. The rate of 0.41% was registered in 2004.[13]

The presence of HIV infection in 19 parturients, among the 4,341 evaluated in this study, results in a proportion of HIV-infection of 4.3 to 1,000 parturient. The Pediatrics American Academy recommends the routinely serologic testing for anti-HIV antibodies in pregnant populations where the prevalence of HIV infection is higher or equal to 1:1,000 live-born infants [14]. The results obtained in this study underscore the necessity of the anti-HIV serological tests in this population.

With regard to the age of the parturients evaluated, no difference was observed among the HIV-infected parturient compared with HIV-uninfected parturient. According the Health Ministry of Brazil, 53.5% of the HIV-infected women aged 20-34 years, with more frequency in the ages of 25 and 29 years (20.6%) [15]. From January 2000 to June 2007, 82.2% of HIV-1 infected women were 20 to 39 years old, with the highest frequency (54.9%) between 20 and 29 years.[16]

The data showing the predominance of HIV-infected parturient among the women with low education levels compared with the HIV-1uninfected parturient confirmed previous studies emphasizing the connection between vulnerability to HIV infection and social inequalities [17,18,19,20,21]. Data from Health Ministry of Brazil showed that there was an increase in the prevalence of illiterate among the women with AIDS (rates ranged from 3.0%, in the period of 1980- 1990, to 5.6%, in 2000), as among the women with 1st to 8th or incomplete education level (ranged from 44.8%, during the period 1980-1990, to 60.7%, in 2000), and occurred a decrease in the AIDS prevalence in women with higher level education, in this

period (from 6.6%, between 1980 and 1990, to 3.6%, in 2000)[15]. From January 2000 to June 2007, 3.4% of the pregnant infected with HIV were illiterate, 50.9% had 1-9 years of schooling, 20.6% had between 8-11 years of schooling, and 3.2% had 12 or more years of schooling.[16]

The results obtained in this study were similar to those reported previously where the difference was not statistically between the seropositive pregnant and seronegative pregnant as regard the frequency of the prenatal care [22]. However, in the United States of America (USA), the HIV-infected women appeared with lower frequency in the prenatal care than HIV-1 uninfected women; 2% of the pregnant did not receive the prenatal care, and among the HIV-infected women, 15% of the HIV diagnosis is made during the period of labor [23,24]. In the United States, the use of illicit drugs was associated with lower prenatal care among the HIV infected women, 35.0% of women that used illicit drugs during the pregnancy did not have the prenatal assistance, while 6.0% among those that did not use illicit drugs did not have the prenatal assistance.[24]

In the present study, one HIV-infected parturient reported the intravenous drug use; however, it was showed a confirmed relationship between the occurrence of HIV infection among the parturients and the IVDU sexual partner. The intravenous drug use, as a category of HIV risk factor in the females, showed a decrease in Brazil, ranging from 31.3% in the period of 1983 to 1990, to 6.3%, in 2000 [24]. Among the males, the rates were 19.5% from 1980 to 1990 and reached the highest frequency in 1991 (32.8%), decreasing to 20.5% and 18.7% in 1998 and 2000, respectively [15]. In June 2007, 4.2% of HIV-infected women and 10.1% of HIV-infected men were intravenous drug users.[16]

Considering that sexual is the main exposure category of HIV among females, with an increase from 66.2% in 1991, to 93.6%, in 2000, and 94.9% in June 2007, the women have been infected with higher progressive frequency through sexual activities with heterosexual, bisexual and/or IVDU sexual partners [15,16]. As a consequence of this fact there is an increasing proportion of perinatally acquired HIV infection cases among children whose infection status and risk factor were not know by the mother.[2]

In the present study, it was shown a positive association between HIV infection in the parturients with the occurrence of previous STD and with the information of the HIV-infected sexual partner. Other prevalence study showed the relationship between STD and the HIV infection [11,21], with higher frequency of HIV infection among women with at least one STD present during the pregnancy than the control group (48% and 21%, respectively, with odds ration of 3.4 (CI 95%: 2.1 – 5.7).[11]

Since 1992, heterosexual contact has exceeded intravenous drug use as the primary exposure category in women with HIV infection. A significant proportion of HIV-infected women are not aware of their own or sexual partner's risk for HIV infection. The result obtained in this study showing that 15.8% of the HIV-infected parturients did not report any risk factor that have been commonly associated with HIV acquisition, such as intravenous drug use or having sex with a partner at known high risk for HIV infection. This is in agreement with previous study carried out in Baltimore (USA) [25], where although the results showed high prevalence of HIV infection among women with risk factors for HIV, 43% of the seropositive women denied any sexual or other risk factor associated with HIV infection. According to this previous study, if the serological test for HIV infection had been be assayed only in women with risk factor for HIV infection, the diagnosis would have been made in only 57% of the HIV-infected women.[25]

The retesting in the third trimester is recommended by some specialists. If possible, this should be carried out before the 36 weeks of pregnancy, only of the pregnant with high risk for HIV infection, such as previous STD, sex workers, multiple sexual partners during the pregnancy, illicit drug use, signals and symptoms of early seroconversion, and sexual partners with risk factors for HIV infection [23]. It is known that a woman is not aware of her own risk even she has only one sexual partner; this fact justifies a second blood sample in all the pregnant in the end of pregnancy or during the labor. A significant proportion of pregnant are neither screened with anti-HIV serological tests women during the prenatal care, nor have a second blood sample collected in the end of pregnancy, nor will have the results of both samples collected in the moment of labor; therefore, the safest strategy to reduce the maternal-to-child transmission of HIV is to assay all the parturients by the rapid test for anti-HIV.

The occurrence of false-positive results demands the use of confirmatory tests for anti-HIV such as IFI or Western Blot. However, the decision of the beginning of the ZDV prophylaxis regimen must be made at the intrapartum period, and must not wait the results obtained by the confirmatory results.[6,23]

With regard to an eventual false-positive result, the medical has to face with the inconvenient that the mothers will be discharged without the confirmatory serological result, which must be conducted during the next Outpatient clinic consultant.

The introduction of the rapid test assay for the diagnosis of HIV infection in the labor period depends of some circumstances supported by the CDC [23], such as the authorization by the pregnant to the rapid test assay and the informed consent to introduce the prophylaxis when indicated. In the present study, the acceptance of the rapid test for the detection of HIV infection reached the rate of 99.7%. This high acceptance shows that the use of rapid test is an appropriate testing program.

**CONCLUSION**

With the results obtained in this study that showed the rate of 0.44% of HIV infection among parturient, the

absence of report of any risk factor associated with HIV infection in 15.8% of HIV-infected parturient, and low education level among the HIV-infected parturient, is it possible to conclude that the women have little information about the HIV transmission and prevention. Therefore, the results underscore the necessity of the use of the rapid test in all the parturient. Some health actions should be reinforced to the prevention of mother-to-child HIV transmission such as the information and the sensitivity of the health care staff about the subject, routine HIV education accompanied by offering HIV testing to all pregnant women, the establishment of algorithms and protocols of specific proceedings for each health service; the availability of a treatment with ZDV to the mother and her newborn at the maternity; the continuing education of the health professionals about the correct technical to assay the rapid test, and individualized counseling before and after the rapid test [26]. These measures might contribute to the diagnosis of HIV infection in a short term with the immediate introduction of the antiretroviral prophylaxis in the positive cases.

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