Original Article

Prevalence and risk factors for Human Immunodeficiency Virus infection in pregnant women*

Prevalência e fatores de risco associados à infecção pelo Vírus da Imunodeficiência Humana em parturientes

Prevalencia y factores de riesgo asociados con la infección del Virus de la Inmunodeficiencia Humana en parturientas

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ABSTRACT

Objective: To determine the prevalence and the risk factors for Human Immunodeficiency Virus (HIV) Infection in pregnant women admitted to the President Prudent State Hospital, São Paulo, Brazil. **Methods:** This was a cross-sectional epidemiological study with 873 participants. Sociodemographic characteristics, gestation clinical characteristics, and prenatal care data were collected with a semi-structure questionnaire, chart review, and prenatal progress notes, from March 1, 2005 to December 30, 2006. **Results:** The prevalence of HIV infection was 2.1%. Participants with HIV infection had lower educational level and they were older and had a higher gestational age than those participants who were HIV negative. The risk factors for HIV infection were living far from prenatal health care services and having low educational level. The findings of the study show an increase in the prevalence of HIV infection in pregnant women compared with data previously reported. **Conclusion:** Higher prevalence of HIV infection in pregnant women may be related to deficiency in preventive measures during the prenatal period.

Key words: HIV infections/epidemiology; Disease transmission, vertical; Questionnaires; Risk factors; Pregnancy

RESUMO

Objetivo: Determinar a prevalência e os fatores de risco associados à infecção pelo Vírus da Imunodeficiência Humana (HIV) em parturientes admitidas no Hospital Estadual de Presidente Prudente, SP. **Métodos:** Estudo epidemiológico transversal com 873 parturientes admitidas no Hospital Estadual de Presidente Prudente, SP, entre 1º de março de 2005 a 30 de dezembro de 2006. Foi aplicado um questionário semi-estruturado e obtidas informações em prontuários e carteiras de pré-natal. As variáveis foram sócio-demográficas, gestacionais, assistenciais do pré-natal e específicas da população reagente. **Resultados:** A prevalência de parturientes com HIV foi de 2,1%, com escolaridades mais baixas e médias de idade e de gestações superiores às não reagentes. Os fatores de risco associados foram a residência fora do município de tratamento e a baixa escolaridade. Houve um aumento da prevalência do HIV em parturientes em relação a dados anteriores. **Conclusão:** Os fatores de risco encontrados podem estar envolvidos no aumento da prevalência e no comprometimento da profilaxia pré-natal para o HIV.

Descritores: Infecções por HIV/epidemiologia; Transmissão vertical de doença; Questionário; Fatores de risco; Gravidez

RESUMEN

Objetivo: Determinar la prevalencia y los factores de riesgo asociados a la infección por el Virus de la Inmunodeficiencia Humana (VIH) en parturientas admitidas en el Hospital Estatal de Presidente Prudente, SP. **Métodos:** Se trata de un estudio epidemiológico transversal realizado con 873 parturientas admitidas en el Hospital Estatal de Presidente Prudente, SP, entre el 1º de marzo del 2005 al 30 de diciembre del 2006. Fue aplicado un cuestionario semi-estructurado y las informaciones obtenidas en las historias clínicas y carnets del prenatal. Las variables fueron socio-demográficas, gestacionales, asistenciales del prenatal y específicas de la población reactiva. **Resultados:** La prevalencia de parturientas con VIH fue de 2,1%, con escolaridad más bajas y promedios de edad y de gestación superiores a las no reactivas. Los factores de riesgo asociados fueron la vivienda fuera del municipio de tratamiento y la baja escolaridad. Hubo un aumento de la prevalencia del VIH en parturientas en relación a datos anteriores. **Conclusión:** Los factores de riesgo encontrados pueden estar involucrados en el aumento de la prevalencia y en el compromiso de la profilaxis prenatal para el VIH.

Descriptores: Infecciones por VIH/epidemiología; Transmisión vertical de enfermedad; Cuestionario; Factores de riesgo; Embarazo

* *Study developed in Hospital Estadual in the West of the state of São Paulo, in the city of Presidente Prudente.*

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INTRODUCTION

In 1981 the first cases of Acquired Immune Deficiency Syndrome AIDS occurred in male homosexuals, calling the attention of the medical community and society and resulting in prejudice and a wrong idea on the real risks for transmission[1]. This led to lack of care in disease prevention by individuals who did not consider themselves as risk group, favoring the spread of the disease[2]. Soon, cases of the disease start to occur in users of injection drugs and in heterosexual who received blood transfusion, making researchers define the disease as infectious, transmitted through contaminated blood and sexual relations[1-2].

It did not take long for the first cases in children from drug users to appear, showing therefore the existence of perinatal transmission[2].

In the world, the epidemic among women was progressive and in the State of São Paulo the ratio men/women new cases increased from 1/27 in the years 1980 to 1/2 in the last five years. In some Brazilian regions the infection ratio is already 1/1, thus increasing the amount of contaminated children[2-4].

The discovery of associated antiretroviral therapy, in the beginning of the 90's provided better health conditions, increase in survival to people with human immune deficiency virus (HIV) together with reduction in vertical transmission which is today the main infection via in children under 13 years old[2-5].

Maternal conditions such as old age, advanced stage of the infection with low CD4 levels, as well as normal delivery and breastfeeding increase the risk for virus infection in children[1-2, 6-7].

There are several methods for serum diagnoses for HIV antibodies which are essential in the prevention and control infection spread; individuals or their legal guardians have to give consent for their performance[1].

Counseling before and after the test is essential to guide and make individuals sensible to their real condition, if result is negative they should receive preventive recommendations, and if it is positive, they have to be aware of the transmission risks to other partners and they should receive information on the clinical aspects of the infection and the therapy used[8].

Another examination required after seroconversion is CD4 cells count, which defines the stage of the infection. Their normal values are equal to or higher than 500/mm³ and levels below this reference are proportionally associated with signs and symptoms of immunosuppression[2].

Brazil was one of the first developing countries to adopt the measures to prevent vertical HIV transmission. These efforts led to the decrease in vertical transmission from 20% to 30% detected in studies before antiretroviral prophylaxis, according to protocol 076 of the AIDS Clinical Trial Group[7], to levels between 2% and 5% checked in the last years, in several Brazilian regions. The Ministry of Health has made resources available to the public health system to enlarge HIV diagnoses, ensuring prenatal examination, offering quick tests to reference institutions, and performing campaigns to encourage spontaneous performance of the test[8].

Additionally to the use of AZT by pregnant women as of the 14th week of pregnancy and at the time of labor, and by newborns until the 6th week of birth, infants exposed should not be breastfed, and should receive formula feeding[7,9].

The Ministry of Health also supplies antiretroviral medication for therapy schemes however, the number of people with HIV, especially pregnant women, using these medication is below expected[7, 9].

It is estimated at 6 million the number of children infected with HIV since the onset of the epidemics and 4.3 millions already died[10].

Until March 2001, the number of cases of AIDS in Brazil was 210,452; 41,052 were women, with predominance of those with low schooling[10].

The estimated number of pregnant women infected by HIV was 12,898 (0.4%) in 1999 and only 2,512 (19.5%) received injectable AZT.

Vertical transmission is responsible for 90% of the total of cases of HIV infection in children below 13[5]. Until the year 2001, there were 7,335 cases of transversal HIV infection with 40% of deaths[10]; this has led to a world concern, because the early identification of seropositive pregnant women means opportunity to prevent virus transmission for infants, thus reducing the dimension of the epidemic.

Ordinance # 569/2000 of the Ministry of Health ensures access and performance of basic examinations that are necessary for adequate follow-up, HIV testing at the first prenatal appointment is one of them[11].

Several studies show that adequate prenatal control contributes to decrease HIV maternal-infant transmission; it is recommended that health services offer individualized counseling to pregnant women. However, actually, care is poor and women seen receive neither proper information nor support from professionals who care for them[7, 8].

Our objective is to determine the prevalence and risk factors associated with HIV infection in pregnant women admitted to Hospital Estadual de Presidente Prudente, SP.

METHODS

Cross-sectional epidemiological study performed at a reference maternal-children Hospital Estadual in the West of the state of São Paulo, in the city of Presidente Prudente. In this hospital there are around 2,000 deliveries every year.

The city has 196,488 inhabitants, and it is a reference for more than 45 cities from the Divisão Regional de Saúde (*Regional Health Division* -DIR) XVI which total 503,332 inhabitants. All pregnant women admitted to Hospital Estadual de Presidente Prudente were investigated from March 1st, 2005 to December 30th, 2006. Pregnant women admitted for clinical and obstetric treatment were excluded form the study.

Data were collected through a semi-structured questionnaire in individual interview with 873 pregnant women and through information obtained in the prenatal card. Pregnant women who did not have HIV results in their prenatal card or who had no documents proving it at admission underwent Rapid HIV test after consent, as recommended by the Ministry of Health and the internal protocol of the Hospital Estadual.

CD4 results of notified pregnant women were obtained through result analysis of the examinations attached to infectology outpatient chart of the same institution.

Result analysis was performed according to the presence (HIV positive group) or absence of HIV (HIV negative group).

The study was approved by the Ethical Research Committee of the Universidade Federal de São Paulo, and by the institution where the research was conducted, participants gave their written consent.

For categorical variables, Fisher's exact test was used and for non-categorical variables, Students'*t* test or Mann-Whitney's test were used as appropriate. Tests were two-tailed and significance level considered was $p < 0.05$. Statistical program used was SPSS (version 14.0).

RESULTS

Sociodemographic characteristics of the 873 pregnant women studied are presented on table 1, where we can see that schooling of the HIV positive population was significantly lower (p=0.002) compared to the HIV negative population. Also, most of the reagent pregnant women live outside the city of Presidente Prudente.

In Table 2, the frequency of prenatal was significantly lower in the HIV positive group (p=0.001) and 17 pregnant women studied did not perform HIV examination.

We can see on Table 3 that the main reasons the examination was not performed were: knowing about seropositivity, pregnant woman did not want to perform it, and it was not required by the physician.

Table 1 – Sociodemographic characteristics of pregnant women studied, according to HIV test result. Presidente Prudente, 2005

Characteristics	HIV positive		HIV negative		P value
	n=18	%	n=855	%	
Age, X	27.8		24,5		
(SD)	(6.9)		(6,1)		
Marital Status					0.418
Single	3	16.7	157	18.4	
Married	4	22.2	329	38.5	
Widow	-	-	3	0.3	
Divorced	-	-	16	1.9	
Lives with partner	11	61.1	350	40.9	
Schooling					0.002
None	-	-	4	0.5	
1 to 3 years	4	22.2	28	3.3	
4 to 7 years	9	50.0	214	25.0	
8 to 11 years	5	27.8	537	62.8	
12 years or over	-	-	72	8.4	
Home					0.352
Presidente Prudente	7	38.9	465	54.4	
DIR XVI	11	61.1	382	44.7	
Other regions	-	-	8	0.9	
Area					0.405
Urban	15	83.3	774	90.5	
Rural	3	16.7	81	9.5	

Table 2 – Gestational characteristics of the population studied, according to HIV test result. Presidente Prudente, 2005

Characteristics	HIV positive		HIV negative		P value
	n=18	%	n=855	%	
Gestations, X	**2.3**		**1.2**		
(SD)	**(2.0)**		**(1.3)**		
Prenatal care					0.001
Yes	15	83.3	847	99.0	
No	3	16.7	8	1.0	
Gestational age (in weeks) At the beginning of prenatal					0.999
< 22	15	100	797	94.1	
22 to 27	-	-	33	3.9	
28 to 31	-	-	12	1.4	
32 to 36	-	-	4	0.5	
37 to 41	-	-	1	0.1	
Number of prenatal appointments					0.186
1 to 3	2	13.3	32	3.8	
4 to 6	3	20.0	200	23.6	
7 or over	10	66.7	615	72.6	
Performance of anti-HIV examination during pre-natal					-
Yes	11	73.3	834	98.5	
No	4	26.7	13	15.0	
Gestational age (in weeks) where anti-HIV examination was performed					-
< 22	11	100	666	78.8	
22 to 27	-	-	99	12	
28 to 31	-	-	37	4.4	
32 to 36	-	-	21	2.5	
37 to 41	-	-	5	0.6	
Ignored	-	-	6	0.7	

Table 3 – Reasons why HIV tests were not performed in pregnant women studied. Presidente Prudente, 2005

Reasons	HIV positive		HIV negative	
	n=4	%	n=13	%
Under age	-	-	1	7.7
Lack of resources in the Basic Health Unit UBS	-	-	2	15.4
Strike at the UBS	-	-	1	7.7
They already new about seropositivity	4	100	-	-
Did not want to do	-	-	5	38.4
Not required	-	-	3	23.1
Did not have the time	-	-	1	7.7

Table 4 – Care characteristics of the population studied, according to HIV test result. Presidente Prudente, 2005

Characteristics	HIV positive		HIV negative	
	n=11	%	n=834	%
Gave written authorization for collection of HIV examination				
Yes	3	27.3	133	16.0
no	8	72.7	667	80.0
Ignored	-	-	34	4.0
Counseling before examination collection				
Yes	5	45.5	296	35.2
no	6	54.5	542	64.8
Provided counseling before the examination				
Social worker	-	-	3	1.0
Health agent	-	-	6	2.0
Nurse	-	-	31	10.5
Multidisciplinary team	-	-	5	1.7
Leaflets	-	-	2	0.7
Physician	5	100	248	83.8
Receptionist	-	-	1	0.3
Examination result informed by physician				
Yes	11	100	783	93.9
No	-	-	51	6.1
Counseling after examination				
Yes	8	72.7	209	25.0
No	3	27.3	635	75.0
Provided counseling after examination result				
Social worker	-		1	0.5
Health agent	-		4	1.9
Nurse	-		23	11.0
Physician	8	100	170	81.3
Multidisciplinary team	-		10	4.8
Leaflets	-		1	0.5

Table 4 shows that most of the population studied did not give written consent for examination collection and did not receive pretest counseling, however, after HIV test result, most of the HIV positive group received counseling, different from what occurred with the HIV negative population. Physicians performed most counseling and the majority of females received the results from the physician.

On table 5 we may observe that a great part of the reagent group was referred to Infectology service and started the treatment recommended, however, 33.3% did not perform CD4 examination.

Table 5 – Specific care characteristics of the HIV positive population. Presidente Prudente, 2005

Characteristics	n= 18	%
Referred to Infectology service		
No	4	22.2
Yes	14	77.8
CD4 Result (mm^3)		
< 200	1	5.6
200-499	8	44.4
500 or over	3	16.7
Not performed	6	33.3
Started treatment		
No	1	5.6
Yes	17	94.4

* CD4 – Helper cells present in the blood called T CD4 lymphocytes.

DISCUSSION

In the present study 97.9% of the pregnant women presented non-reagent serology, indicating a 2.1% prevalence of HIV infection, 83.3% of them already knew their condition before pregnancy and 16.7% discovered their seropositivity during prenatal care. These data make the rights of women with HIV/AIDS to have children stronger, the desire to have children is something cultural and they are entitled to a conscious decision, even if they have concerns regarding the risk of contamination and the prejudice they may face in their lives[12]. Despite the dangers, they continue their life project since having a child is an encouragement for these women[12]. Another study conducted in the same institution from 2000 to 2004, demonstrated a 1% prevalence of HIV infection in pregnant women seen in the service of Gynecology and Obstetrics[13]. Our study demonstrated an increase in HIV prevalence in pregnant women seen in this service, compared to the previous years. A possible explanation is the profile of the population assessed, since in the present study only pregnant women have been selected. As it is a reference hospital, HIV positive pregnant women are referred to our unit by other health units.

Similar to our results, other authors in Brazil and in the world have demonstrated that women from less

privileged social classes and with lower schooling have less access to testing and HIV prenatal counseling[4, 14-15].

We have identified that 61.1% of the pregnant women with reagent serology lived outside the city of Presidente Prudente, in cities that belonged to DIRXVI. This probably interferes in the adherence and quality of treatment since many pregnant women cannot find transportation, do not have enough financial resources and depend on ambulances to attend the appointments and collect the material for the required examinations. These women presented an increase in age and number of pregnancies (27.8 years old and 2.3 pregnancies) when compared to the HIV negative population (24.5 years old and 1.2 gestations), respectively. Unlike our results, it has been demonstrated that HIV infection has increased among young and adolescent women[16]. Additionally, data contradict the idea of low fertility among HIV positive women mentioned by some studies[17-19].

As for the variable prenatal performance, 98.7% of the pregnant women interviewed did prenatal care, and only 1.3% did not undergo prenatal care thus demonstrating a proper coverage of this service in the population studied. Among the 11 pregnant women who did not start prenatal care, 3 (16.7%) were seropositive with previous knowledge of their condition, demonstrating a greater concern in looking for the infectologist who performs follow-up before going to prenatal care, and this behavior may be explained by the creation of bonds which is very common in the treatment of chronic diseases, due to the fear of discrimination and prejudice and of having other professionals knowing about you situation[17, 20].

Offering HIV examination during prenatal care started in 1995 and it should be offered to all pregnant women regardless of risk behavior[8, 11]. Volunteer test is recommended and it is always followed by pre and post examination counseling, to explain to women the meaning of the tests and inform them on forms of infection transmission and prevention[7-8, 17]. In the present study, 98.0% of the pregnant women performed HIV test during pregnancy, and 2.0% of them were not tested. These data are higher than the national average in HIV prenatal examination (85%) obtained in 2004[21]. Rapid HIV tests, which were negative, were applied to pregnant women who had not been previously tested or who did not have the results at the time of admission, apart from the four pregnant women in the HIV positive group, because they had disclosed their seropositivity and because they had records with documents proving the infection in the institution.

Among the pregnant women performing HIV test during prenatal care, only 16.8% gave their written consent for examination and 83.2% did not sign a document authorizing collection. For many of them, there was only verbal consent and many pregnant women could not say whether they had signed an authorization for exam collection. Offering this test in health system should be universal and it has to be volunteered, the Federal Council of Medicine cannot make HIV serology mandatory and individuals or their guardians must give their written consent[1, 17].

As for follow-up of these pregnant women, only 35.6% received counseling at pretest, whereas 64.8% did not receive any kind of counseling. In post-test, 25.6% received counseling and 75.5% did not receive it. The way information is given by health professionals and understood by pregnant women may help them know their real risks and meet the determinations of the team. Thus, proper prenatal care should provide individual counseling to pregnant women so that they receive information on HIV transmission and the meaning of tests. A welcoming and efficient health service will contribute to adherence to medical and treatment determinations[8, 17, 22]. It is interesting to notice that 11% of the pregnant women received counseling by nurses in post test, highlighting the role of this professional in this procedure.

Anti-retroviral treatment recommended to reduce vertical transmission was started by 94.4% of the seropositive pregnant women. Among them, 3 started on the 14th week of pregnancy, six in the 16th week and 9 in the 20th week. Overall, treatment started early and we could see a great interest and concern by most women to adhere to treatment, so that their children can benefit from it.

In the present study, among the 18 seropositive pregnant women, 3 had CD4 results greater than 500/mm³, eight between 499 and 200/mm³, one with result lower than 200/mm², and six did not perform examination.

CONCLUSION

Our study showed an increase in HIV prevalence in pregnant women regarding previous data obtained in the same institution. Low schooling and living outside the city where care was being provided were the main associated risk factors found and it may have contributed to the increase in prevalence and compromised treatment and HIV testing during prenatal.

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