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Voluntary HIV counseling and testing during prenatal care in Brazil

Aconselhamento e testagem voluntária para o HIV durante a assistência pré-natal

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Keywords
HIV infections, diagnosis. Counseling. Prenatal care. HIV. Socioeconomic factors.

Abstract

Objective
Voluntary HIV counseling and testing are provided to all Brazilian pregnant women with the purpose of reducing mother-to-child HIV transmission. The purpose of the study was to assess characteristics of HIV testing and identify factors associated with HIV counseling and testing.

Methods
A cross-sectional study was carried out comprising 1,658 mothers living in Porto Alegre, Brazil. Biological, reproductive and social variables were obtained from mothers by means of a standardized questionnaire. Being counseling about HIV testing was the dependent variable. Confidence intervals, chi-square test and hierarchical logistic model were used to determine the association between counseling and maternal variables.

Results
Of 1,658 mothers interviewed, 1,603 or 96.7% (95% CI: 95.7–97.5) underwent HIV testing, and 51 or 3.1% (95% CI: 2.3–4.0) were not tested. Four (0.2%) refused to undergo testing after counseling. Of 51 women not tested in this study, 30 had undergone the testing previously. Of 1,603 women tested, 630 or 39.3% (95% CI: 36.9–41.7) received counseling, 947 or 59.2% (95% CI: 56.6–61.5) did not, and 26 (1.6%) did not inform. Low income, lack of prenatal care, late beginning of prenatal care, use of rapid testing, and receiving prenatal in the public sector were variables independently associated with a lower probability of getting counseling about HIV testing.

Conclusions
The study findings confirmed the high rate of prenatal HIV testing in Porto Alegre. However, women coming from less privileged social groups were less likely to receive information and benefit from counseling.

Descritores
Infecções por HIV, diagnóstico. Aconselhamento. Cuidado pré-natal. HIV. Fatores socioeconômicos.

Resumo

Objetivo
O aconselhamento e teste voluntário para o HIV foram instituídos no Brasil para todas as gestantes com o objetivo de reduzir a transmissão materno-infantil do vírus. O objetivo do estudo é verificar as características de testagem do HIV e identificar os fatores associados com a oportunidade da gestante ser aconselhada para esse teste.

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Métodos
Estudo transversal que incluiu 1.658 mães residentes em Porto Alegre, RS. Variáveis biológicas, reprodutivas e sociais foram obtidas utilizando-se um questionário padronizado. Ser aconselhada para o teste de detecção do HIV foi a variável dependente. Para determinar os fatores associados à oportunidade de aconselhamento foram utilizados intervalos de confiança de 95%, o teste de qui-quadrado e uma análise multivariada utilizando o modelo hierarquizado.

Resultados
De um total de 1.658 mulheres entrevistadas, 1.603 ou 96,7% (IC 95%, 95,7%-97,5%) foram testadas para o HIV, 51 ou 3,1% (IC 95%, 2,3%-4,0%) não foram testadas e quatro (0,2%) se negaram a fazer o teste. Das 51 não-testadas, 30 haviam feito o teste previamente. Das 1.603 mulheres testadas durante a gestação, 630 ou 39,3% (IC 95%, 36,9%-41,7%) foram aconselhadas sobre o teste, 947 ou 59,1% não o foram (IC 95%, 56,6%-61,5%) e 26 (1,6%) não informaram. Baixa renda, não ter acesso ao pré-natal, iniciá-lo tardiamente, uso do teste rápido, e realizar o pré-natal no setor público estavam independentemente associados a uma menor probabilidade de ser aconselhada.

Conclusão
O estudo confirmou uma alta taxa de testagem para o HIV. As gestantes provenientes de grupos sociais menos privilegiados foram aconselhadas em menor freqüência para a realização do teste de HIV.

INTRODUCTION

Voluntary HIV counseling and testing (VCT) is a key factor in the prevention of mother-to-child (MTC) HIV transmission. This strategy promotes adequate treatment for HIV positive women and has a positive impact on MTC HIV transmission rates. For HIV negative women, it provides an opportunity for education and behavioural change.[14]

The Brazilian Ministry of Health runs a publicly funded VCT program aimed at all pregnant women to reduce MTC HIV transmission. The purpose of counseling on HIV testing is to reduce emotional stress through the perception of risks and benefits associated with this intervention.[9] The adoption of safe practices and a higher compliance with individual and collective treatment are among the expected results that may lead to reducing MTC HIV transmission.

The program also includes free antiviral drugs for HIV positive women and newborns, as well as formula feeding for newborns during the first 6 months of life. The program has had an extremely significant impact in terms of MTC transmission, with a decrease from 809 HIV infected newborns in 1996 to 41 in 2001.[7]

In spite of the significant impact on MTC transmission rates, no investigation about the patterns of VCT in Brazil has been conducted. Only one study has evaluated the frequency of HIV testing in prenatal care in Brazil, and its authors reported a prevalence rate of 68.3% for HIV testing. [12]

Thus, the purpose of this study was to identify the characteristics of voluntary HIV testing and factors associated with counseling on HIV testing during prenatal care in the Brazilian public health system.

METHODS

This cross-sectional hospital-based study was carried out from September 2000 to June 2001 in Porto Alegre, a city with 1,360,000 inhabitants in southern Brazil.

Hospital deliveries correspond to 99% of all live births in the city. A sample of 1,658 mothers living in the city was interviewed after delivery at the three most important public hospitals, a number which corresponded to all deliveries occurred during the three months of study.

Sample size was stratified according to the total number of deliveries occurring at each hospital. The sample size of 1,086 subjects was calculated according to an infinite population with estimated rates of no counseling of 52% and worst result of 47% with a 95% of confidence interval. The sample size was amplified in 50% in order to overcome possible difficulties during data collection and analysis. According to data from 1998, the three hospitals included in the study accounted for 9,065 deliveries per year, corresponding to 43.2% of all deliveries in the city. The sample corresponded to 7.9% of the total number of deliveries in the city, and to 13.8% of all deliveries occurring in public hospitals in the city. This suggests

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that the study sample represented the population attending public maternities in Porto Alegre. Being counseled about HIV testing during the prenatal period was the dependent variable. Biological, economic, social, and reproductive data, in addition to data about medical care in previous and current pregnancy were obtained from mothers using a standardized questionnaire. Interviews were conducted by trained personnel under the supervision of the research team.

When necessary, data were collected from medical records. Less than 1% of the mothers refused to be interviewed. Some data were missing for some mothers because the answers were not found in the medical records.

The mothers were asked whether they had received any information about the risk of MTC transmission and the benefits of HIV testing, and what kind of information they were given. The variable "being counseled about HIV testing" was positive when mothers received any explanation about the importance of HIV testing for pregnancy outcome. This variable was not positive when mothers were only informed about the test.

To investigate the associations between "being counselled" and social, biological and demographic variables, a hierarchical logistic regression model was used. According to this model, socioeconomic variables were the first events that should directly or indirectly determine outcome.[16] The chi-square test was used, and odds ratio and 95% confidence intervals (CI) were calculated. All pregnant women tested for HIV infection were included, even if they had not attended prenatal care visits, since this was an opportunity to counsel them about the rapid testing for HIV at hospitals in the perinatal period.

The mother's opinion about the impact of the counseling session on clarifying the benefits of HIV testing was classified according to two semi-structured questions using a 5-point scale: highly positive, moderately positive, not positive, not positive due to previous counseling, and no opinion about counseling session.

The following independent variables were used in the analysis: maternal age (≤17, 18–30, 31–44, not known), maternal schooling in years (no schooling, 1–6, 7–10 >10, not known), maternal marital status (married, single, not known), number of pregnancies including the current one (1, 1–4, >4), attending prenatal care (yes, no, not known), pregnancy trimester when the prenatal first visit took place (1st, 2nd, 3rd, not known), prenatal care provider (private, public, not known), gestational age in weeks (counting from the last day of menstrual period) as a continuous variable, and head income (in tertiles).

Consent and approval for the study were obtained from clinical directors and ethics committees of the three hospitals.

RESULTS

Of 1,658 mothers interviewed, 1,603 or 95.7% (95% CI: 94.5–96.5) were tested for HIV before or during pregnancy. Thirty or 1.8% were tested only before the current pregnancy, 21 or 1.3% (95% CI: 0.7–1.9) were not tested either before or during the current pregnancy, and four refused to undergo testing after counseling. Thus, in general, 1,633 pregnant women or 98.5% (95% CI: 97.8–99.0) of the total sample were tested for HIV at some point in their lives. Of these, 36 or 2.2% (95% CI: 1.5–3.0) women were diagnosed as HIV positive.

Table 1 presents the timing of HIV testing and the prevalence of HIV positive women, and shows that 77.5% of the mothers were tested during the first and second trimesters. The results point out the high frequency of testing in the early gestational period and the large amount of HIV positive women diagnosed before the current pregnancy.

The health worker more frequently involved in the request of the HIV testing was the general practitioner (Table 2) Of the 1,603 women tested in the present study, 630 or 39.3% (95% CI: 37.2–42.0) were counseled about testing at least once. Some of the women in this group underwent HIV testing more than once. A total of 795 tests were performed, which cor-

Table 1 - Timing of the first HIV test and rate of HIV+ patients according to trimester of pregnancy in Porto Alegre, Brazil.

Period	N	(%)	95% CI	HIV+ N	Rate (%)
Before current pregnancy	30	1.4	0.9-2.1	16	53.3
First trimester	539	32.5	30.2-34.8	4	0.7
Second trimester	723	43.6	41.2-46.0	8	1.1
Third trimester	220	13.3	11.7-15.0	3	1.4
Rapid testing before delivery	48	2.9	2.1-3.8	5	10.4
Not tested	21	1.4	0.9-2.1	-	-
Refused to be tested	4	0.2	0.1-0.6	-	-
Not known	73	4.9	3.9-6.0	-	-
Total	1,658	100		36	-

responds to 1.3 tests per woman in this group. On the other hand, 947 or 59.2% (95% CI: 57.1–61.9) were not counseled, and 24 or 1.4% (95% CI: 0.8–2.0) did not inform. In this group, 1,200 tests were performed, which corresponds to 1.26 tests per woman.

Of the 947 mothers not counseled, 277 or 29.2% (95% CI: 26.4–32.3) were not informed that the test had been performed, and 53 or 5.6% (95% CI: 4.2–7.2) received the information that HIV testing was mandatory. Of the mothers who were counseled, 39 or 6.2% (95% CI: 4.4–8.4) also received the information that testing was mandatory.

Mothers' opinions about the counseling session showed that it was highly effective in clarifying the benefits of HIV testing (Table 3). During the counseling sessions, only three (0.5%) pregnant women refused to be tested.

Tables 4 and 5 show the rates and association of no counseling according to some mothers' characteristics. Low income, late beginning of prenatal care, use of the rapid test, and absence of prenatal care

Table 2 - Health care worker who requested HIV testing in the current pregnancy.

Solicitor	N	%	95% CI
General practitioner	1,553	93.7	92.4-94.8
Other health worker	17	1.1	0.5-1.6
Other	6	0.4	0.1-0.8
Not known	57	3.4	2.6-4.4
Not tested	25	3.3	1.0-2.2
Total	1,658		

Table 3 - Mothers' opinion about the counseling session (clarifying the benefits of HIV testing).

Opinion	N	(%)	95% CI
Many points were clarified	401	63.6	59.7-67.4
Some points were clarified	12	1.9	1.0-3.3
Few points were clarified; many doubts remained	10	1.5	0.8-2.9
Already informed; no additional information was given	199	31.6	28.0-35.6
Not known	8	1.3	0.5-2.5
Total	630		

Table 4 - Rates of no counseling according to maternal variables.

Variable	N (%)	No counselling N (%)	95% CI	χ^2
Head income				<0.01
High tercentile	495 (31.4)	273 (55.1)	50.6-59.4	
Medium tercentile	480 (30.4)	294 (61.2)	56.7-65.6	
Low tercentile	473 (30.0)	306 (64.7)	60.2-69.0	
Not known	129 (8.2)	74 (57.4)	48.4-66.0	
Maternal schooling				0.6
High school and university	488 (30.9)	283 (58.0)	55.5-62.4	
Elementary school	1,067 (67.7)	651 (61.0)	58.0-63.9	
Illiteracy	21 (1.3)	12 (57.1)	34.0-78.2	
Not known	1 (0.1)	1 (100)	-	
Marital status				0.9
Married	1,424 (90.3)	854 (60.0)	57.4-62.5	
Single	149 (9.4)	90 (60.4)	52.1-68.3	
Not known	4 (0.2)	3 (75.0)	19.4-99.4	
Number of pregnancies				<0.01
2-3	663 (42.0)	409 (61.7)	57.9-65.0	
1	529 (33.5)	285 (51.9)	47.5-56.2	
>3	385 (24.4)	253 (65.7)	60.7-70.4	
Maternal age				0.4
18-30 years	1,052 (66.7)	623 (66.7)	56.9-62.2	
≤17 years	184 (11.7)	107 (58.1)	50.7-65.4	
31-44 years	340 (21.6)	216 (63.5)	58.2-62.2	
Not known	1 (0.1)	1 (100)	-	
Beginning of antenatal care				0.04
First trimester	812 (51.5)	474 (58.4)	54.9-61.8	
Second trimester	605 (38.4)	365 (60.3)	56.3-64.2	
Third trimester	103 (6.5)	64 (62.1)	52.0-71.5	
Not known	57 (3.6)	44 (77.2)	64.2-87.8	
Only rapid test for HIV				
No	1,497 (94.9)	875 (58.4)	55.9-61.0	0.01
Yes	36 (2.3)	33 (91.7)	77.5-98.2	
Not known	44 (2.8)	39 (88.6)	75.4-96.2	
Antenatal care provider				0.49
Public	1,376 (87.3)	831 (60.4)	57.7-63.0	
Private	201 (12.7)	116 (57.7)	50.6-64.6	
Antenatal care				0.01
Yes	1,538 (97.5)	912 (59.3)	56.8-61.8	
No	39 (2.5)	35 (89.7)	75.8-97.1	

were associated with not being counselled during the current pregnancy. On the other hand, women in the first pregnancy were more likely to be counselled about HIV testing. After adjusting, the variable related to using a public health provider during the prenatal care was also associated with no counseling on HIV testing.

DISCUSSION

Voluntary counseling and HIV testing is a complex strategy, and its efficacy depends on general health provision policies, continued education of health workers, and patient characteristics. This study revealed a high rate of HIV testing in Porto Alegre associated with poor access to information about the benefits of the testing. Counseling was dissociated from the VCT strategy as a whole; as a result, many women underwent mandatory testing.

Some methodological problems inherent to observational studies should be pointed out. First, there is the potential for recall bias, mainly for women tested early during the prenatal care period. Second, the mothers' opinions about counseling depend on their expectations in terms of type and amount of information needed, and it is affected by their personal characteristics and by the skills of health workers. Third, the investigation of events associated with a great deal of prejudice and social discrimination, such as HIV and AIDS, may yield less precise information. The study may partially have overcome these difficulties because of the careful training of the research staff.

In the study, a convenience sample was collected in only three maternities of the city, which may decrease the possibility of generalizing the findings described herein. However, the effect of this possible bias may be minimized by the fact that the sample was collected in the most representative public maternities in terms of number of deliveries, where pregnant women from all parts of the city are seen.

This study does not confirm the findings reported by Bergenstrom and Sherr,[1] who collected data from obstetricians and reported a high rate of counseling and consent for HIV testing during prenatal care in public health centers in Porto Alegre. In this study,

Table 5 - Hierarchical model for no counseling on HIV testing during pregnancy in Porto Alegre, Brazil.

Variable	Odds ratio	95% CI	Adjusted* odds ratio	95% CI
Head income**				
High tercentile	1.00			
Medium tercentile	1.3	0.9-1.6	1.3	0.9-1.6
Low tercentile	1.5	1.1-1.9	1.5	1.1-1.9
Not known	1.1	0.7-0.6		
Maternal schooling**				
High school and university	1.00			
Elementary school	1.1	0.9-1.4	1.0	0.8-1.3
Illiterate	0.9	0.4-2.3	0.8	0.3-2.0
Not known	-	-		
Marital status**				
Married	1.0			
Single	1.0	0.7-1.4	0.9	0.7-1.4
Not known	2.0	0.2-19.3	1.3	0.1-14.6
Number of pregnancies***				
2-3	1.0			
1	0.7	0.6-0.9	0.7	0.5-0.9
>3	1.2	0.9-1.5	1.1	0.8-1.3
Maternal age***				
18-30 years	1.0			
≤17 years	1.2	0.9-1.5	1.0	0.8-1.4
31-44 years	0.9	0.7-1.3	1.1	0.8-1.6
First antenatal visit****				
First trimester	1.0			
Second trimester	1.1	0.9-1.4	1.0	0.8-1.3
Third trimester	1.2	0.8-1.8	0.9	0.6-1.5
Not known	2.4	1.3-4.7	0.8	0.3-1.9
Only rapid test for HIV****				
No	1.0			
Yes	7.2	2.2-23.8	4.8	1.3-16.9
Not known	5.2	2.1-13.6	5.7	2.2-14.8
Antenatal care provider****				
Private	1.0			
Public	1.1	0.8-1.5	1.5	1.1-2.1
Antenatal care****				
Yes	1.0			
No	6.0	2.1-16.9	5.0	1.2-25.8

*Adjusted for gestational age.
**Model 1, socioeconomic variables: head income, maternal schooling, marital status.
***Model 2, biological variables: maternal age, number of pregnancies plus model 1.
****Model 3, medical care variables: beginning of antenatal care, rapid test, antenatal care provider, antenatal care plus model 2.

even the group who received prenatal care in the private sector (more likely to be counseled) had a majority of patients who had not been counseled. These contradictory results may represent real differences between knowledge and practice.

Many factors may be involved in not performing VCT as recommended, especially when it is aimed at vulnerable mothers at increased risk for HIV infection. One of these factors is the concern of the medical staff with the mother's refusal to be tested after counseling, which may play an important role in their decision to either not inform mothers or oblige them to undergo testing. However, the study showed that in the great majority of cases, the counseling session was well accepted and clarified the procedure – so there is no reason for such concern. Only four mothers refused to undergo testing after the counseling session. So, the rate of acceptance was similar to the 99% rate observed in France and Sweden,[5,8] and higher than the 44% and 95% rates observed in England and in the United States, respectively.[4,6]

A second factor is that health workers have a high workload and lack the skills that would enable them to provide a safe environment for open communication about social habits and behaviours, as well as about the benefits of testing. The high workload in prenatal clinics, which results in an inadequate number of prenatal visits, may reduce opportunities for counseling. However, it was noted that VCT was conducted with only a small percentage of women even when the number of visits was adequate. Continued education programs for health workers and workload reduction, mainly for the doctors responsible for requesting tests, may improve the quality of this intervention.[3,15]

Third, some health workers assume that pregnant women have already been informed about the benefits of HIV testing, and thus believe that reinforcing these points is not necessary. The study results, however, showed that most counselled women thought that the issues about HIV testing dealt with during the counseling session were relevant. The fact that counseling did not bring additional information for a significant number of women does not justify the current practice.

Fourth, after HIV testing became a routine practice in prenatal clinics, many people started to assume that it is not an embarrassing issue anymore from an ethical and psychological point of view. This may partially explain the low rates of counseling observed for multiparous women. At the same time, the high prevalence of HIV in Porto Alegre may lead health workers to believe that all pregnant women are at high risk for HIV infection, which would justify the implementation of mandatory testing.

These findings may partially explain the high acceptance of HIV testing, but Biehl et al. showed that HIV testing in low-risk women in Brazil is still associated with high levels of anxiety.[2] In the Ivory Coast, women at high risk for HIV infection were less likely to return to the clinic to know the test results. This may mean that finding out about the result of the test is still considered a stressful situation, even in high-prevalence settings. In these cases, the lack of supervision and commitment on the clinical staff may be an additional deficiency associated with the lack of counseling.[10]

Finally, regarding the characteristics of pregnant women, less privileged social conditions, such as low income and poor access to prenatal care, were associated with not being counselled for HIV testing. On the other hand, using the private sector in the prenatal period was associated with a higher probability to counseling. This finding reinforced the strong association between different socioeconomic backgrounds and different health practices and treatments.

Mandatory HIV testing may be a real barrier for women at risk for HIV infection, since a great deal of prejudice is still associated with this diagnosis. This may cause women to avoid seeking prenatal care.[11, 14] In addition, this may partially explain the steady decrease in the number of prenatal care visits that has been observed in Porto Alegre along the past six years.[13] However, further investigation has to be carried out in order to confirm this hypothesis.

The study findings raise several concerns, since maternal health is closely associated with the health of the newborn. Therefore, the lack of maternal knowledge about HIV infection during pregnancy may be a real threat to mothers and newborns in the future. Coercion in testing violates autonomy and body integrity. The informed decision to undergo testing has to be made by women themselves. Investments to improve the quality of communication and continued education of health workers may play an important role in improving this state of affairs.

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