Screening HIV in Pregnancy

A Survey of Prenatal Care Patients

Veronique Dorval, MD¹

Kerri Ritchie, PhD^{1,2}

Andrée Gruslin, MD, FRCS^{1,3}

ABSTRACT

Background: Women in Canada, as in the rest of the world, represent an increasing proportion of new HIV positive cases.¹ In 2002, women accounted for 25% of all positive HIV tests reported in Canada;² with the majority being in their childbearing years (15 to 39 years), perinatal transmission of HIV in Canada is cause for concern.² Following the development of interventions that can effectively reduce vertical transmission rate, prenatal screening of HIV has become the first and most pivotal step in the prevention of mother-to-child HIV transmission.³⁻⁵ The purpose of this study was to assess how women's knowledge and attitudes regarding HIV and HIV screening in pregnancy influence screening rates.

Method: A prospective anonymous survey of 231 women attending antenatal care clinics at a teaching university hospital or in a community clinic was conducted.

Results: In general, pregnant women supported universal HIV screening in the prenatal period. Women who previously had been tested for HIV and who did not perceive that they were at risk for contracting HIV were more likely to decline HIV testing in their current pregnancy. Overall knowledge regarding HIV and its transmission is less than optimal, particularly among those women who declined HIV testing.

Conclusion: Knowledge gaps exist between women accepting and declining prenatal HIV screening, particularly relating to benefits of screening. These results suggest that efforts have to continue to be put into educating the public but also, importantly, into changing current attitudes.

MeSH terms: HIV/AIDS; screening HIV in pregnancy; knowledge of HIV transmission; HIV risk factors

In Canada, as in the rest of the world, women of reproductive age represent an increasing proportion of new HIV positive cases (25% in 2002).^{1,2} Therefore, perinatal transmission of HIV is cause for concern.² Following the development of interventions³⁻⁵ that can effectively reduce mother-to-child transmission rates, prenatal screening of HIV has become an essential step in disease prevention.

In the last 10 years, provincial health care regulatory bodies have adopted policies encouraging health care providers to offer HIV screening to all women as a part of prenatal care.⁶ The Ontario Ministry of Health and Long-Term Care has advocated such a policy since 1998.⁷ Due to complex psychosocial and ethical issues raised by HIV, in Ontario, HIV testing is performed only after informed consent and appropriate pre- and post-test counseling is conducted (opt-in policy).⁸ Since its implementation, Ontario's HIV screening rates of pregnant women has climbed steadily from 47% in 1999 to 76.6% in 2003.⁹ Since this intervention is not universally accepted by pregnant women, a certain percentage of infants remain at risk of acquiring HIV perinatally.^{10,11}

The first goal of this study was to survey HIV knowledge in a sample of pregnant women recruited immediately prior to their first antenatal appointment. The second goal was to discern factors influencing the accepting or declining of HIV testing.

METHOD

Ottawa Hospital Research Ethics Board approval was obtained for this study. A literature search was conducted with MEDLINE (1966-2005) to seek articles on women's attitudes regarding HIV testing in pregnancy. Lists of questions were developed in order to assess knowledge of HIV transmission and HIV risk factors, as well as to gauge women's attitudes regarding HIV screening. Multiple responses and responses that were not encompassed by the given options were allowed (Appendix 1).

Women were recruited immediately prior to their first antenatal appointment, held at the Ottawa Hospital, a tertiary care centre providing routine and high-risk antenatal care, and Lancaster Medical Clinic, a family practice. Two hundred and sixty-three women were approached,

La traduction du résumé se trouve à la fin de l'article.

1. Department of Obstetrics, Gynecology and Newborn Care, Division Maternal-Fetal Medicine, University of Ottawa, Ottawa, ON

2. Department of Psychology, Faculty of Arts, University of Ottawa, The Ottawa Hospital

3. Ottawa Health Research Institute, The Ottawa Hospital

Correspondence: Dr. Andrée Gruslin, Associate Professor – GFT, Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, University of Ottawa, 501 Smyth Road, Ottawa, ON K1H 8L6, Tel: 613-737-8797, Fax: 613-737-8070, E-mail: agruslin@ottawahospital.on.ca

consecutively and individually, as they awaited their physicians (January 2005–March 2005). Informed consent was obtained and questionnaires took 5–10 minutes to complete.

RESULTS

Results were analyzed using SPSS 13.0. Of the 263 women approached, 235 accepted to participate in this study. Four of the questionnaires were excluded due to incomplete data. Of the 231 women who completed the questionnaire, 81% (n=188) indicated that they would be screened for HIV in their present pregnancy.

Forty-four percent of the women who declined prenatal HIV screening were immigrants versus 13% in the group who accepted to be screened. Thirty-two percent of the women who declined screening spoke a language other than English or French compared to 7% of the women who accepted to be screened (Table I). Additional demographic information is presented in Table I.

Women were generally very open to the idea of prenatal HIV screening, with 92% agreeing that it should be offered universally to all pregnant women. The majority (70%) of those declining HIV prenatal screening were in favour of offering HIV screening in pregnancy, but 30% of those declining testing believed it should only be offered to those at risk. Seventy-two percent of the women agreed with Ontario adopting an opt-out policy and 24% preferred that consent be obtained prior to HIV testing; however, this issue seemed to be more important for those who indicated that they would decline testing (47% declining versus 19% accepting).

HIV Knowledge Scale scores (Table II) were satisfactory to borderline, with 87% identifying 4 of 6 basic facts relating to HIV. Eighty-nine percent of the women who indicated that they would accept HIV screening correctly identified 4 of 6 basic HIV facts. Seventy-seven percent of the women who reported that they would decline HIV testing identified 4 of 6 risk factors for HIV.

Eighty-three percent of the women identified 4 of 6 HIV Risk Knowledge facts. Eighty-six percent of women accepting screening versus 70% of women declining screening identified 4 of 6 HIV transmis-

TABLE I

Demographics

	All Patients % (N=231)	Accepted % (N=188)	Declined % (N=43)
Immigrated to Canada	20	13	44
Primary language			
English	67	75	33
French	20	17	33
Other	13	7	32
Level of education			
Primary	2	2	0
High school or equivalent	21	18	35
College or university	78	80	65
Married or in a stable relationship of more than a year			
Yes	96	96	95
No	4	4	5
Children			
Yes	40	44	21
No	60	56	79
Age of participants (years)			
14–19	1	1	0
20–25	14	14	14
26–31	40	41	36
32–37	37	35	45
≥3	8	9	5

TABLE II

Level of General HIV Knowledge for All Patients

	All Patients % (N=231)	Accepted % (N=188)	Declined % (N=43)
It is caused by a virus	64	65	58
It can be transmitted by simple household contact	2	2	2
It can be transmitted by kissing	11	11	14
It can be transmitted through sex	99	99	95
HIV can be transmitted from a mother to her fetus	95	96	88
Someone can be infected with HIV without presenting any symptoms	81	86	63
Use of condom may prevent transmission	91	94	79
HIV can be transmitted through breastfeeding	35	36	30
Women correctly identifying all facts	24	26	16
Women correctly identifying only 5 out of 6	60	63	46
Women correctly identifying only 4 out of 6	87	89	77
Women correctly identifying only ≤3 out of 6	13	11	26

TABLE III

Level of Knowledge of Risk Factors for HIV Transmission

	All Patients % (N=231)	Accepted % (N=188)	Declined % (N=43)
Unprotected homosexual contact	95	97	86
Unprotected heterosexual contact	95	98	81
Receipt of a blood product such as a blood transfusion	91	93	84
Intravenous blood product such as blood transfusion	86	88	77
Having an STD in the past	21	22	16
Having a sexual partner with a history of STD	40	42	33
Women correctly identifying all HIV risk factors	18	20	12
Women correctly identifying only 5 out of 6	33	37	21
Women correctly identifying only 4 out of 6	83	86	70
Women correctly identifying only ≤3 out of 6	17	14	29

sion facts (Table III). Only 35% of the women knew that HIV could be transmitted through breastfeeding (36% of “accepters” versus 30% for “decliners”).

Most women in this survey perceived that in the context of maternal HIV seropositivity, there was a high risk of HIV transmission from mother to fetus (72%) (Table IV). However, 30% of the women who reported that they would decline

screening thought that HIV was always transmitted to the fetus versus 16% of those who would accept screening. Women who indicated that they would agree to HIV testing were more likely to be aware of the existence of therapeutic agents that could reduce the mother-to-child transmission rate (64%) than were those who reported that they would decline (35%) (Table V).

TABLE IV**Perception of HIV Transmission Risk from Mother to Fetus**

	All Patients % (N=231)	Accepted % (N=188)	Declined % (N=43)
No risk	1	.5	2
Low risk	9	11	2
High risk	72	73	65
Always transmitted	19	16	30

TABLE V**Perceived Benefit of HIV Screening in Pregnancy**

	All Patients % (N=231)	Accepted % (N=188)	Declined % (N=43)
No benefit	2	2	5
Not certain of benefit	25	23	33
Medications can be prescribed to lower transmission rates	58	64	35
Help with decisions re: termination of pregnancy	48	48	44

TABLE VI**Primary Rationale for Accepting or Declining HIV Testing**

	Accepted (n=188) % (n)	Declined (n=43) % (n)
Will benefit self and baby	66% (125)	2% (1)
Physician offered testing	36% (68)	0% (0)
Not at risk	0.5% (1)	65% (28)
Have had test before	0.5% (1)	37% (16)

For women who indicated that they would accept HIV screening, 66% reported believing that testing would benefit themselves and their baby versus 2% (1) of the women who would decline testing. Thirty-six percent of the women who would accept HIV testing would do so because their physician offered it. None of the women who would decline testing chose this response (Table VI).

In the group of women who reported that they would decline HIV testing, 66% indicated that they did not perceive themselves as having any HIV risk factors. Further, 37% of the women who would decline HIV screening would do so because they previously had been tested for HIV. In comparison, for the group of women who would accept HIV screening, only 0.5% or 1 individual chose these responses (Table VI).

Given this dichotomized response pattern between accepters and decliners (i.e., they endorsed different reasoning for their decisions), we were unable to examine reasoning for accepting and declining in the context of a logistic regression. Instead, descriptive statistics were used to examine reasons for accepting or declining testing in the context of HIV knowledge.

Twenty-eight women declined screening and indicated that they did not perceive

themselves to be at risk for contracting HIV. Of these women, only 4 (14%) correctly answered the HIV Knowledge questions, 5 (18%) correctly answered the HIV Risk Knowledge questions, and 8 (29%) correctly answered 5 of 6 of the HIV Risk Knowledge questions.

Sixteen women indicated that they would decline testing because they had been tested previously for HIV. Of these women, 5 (31%) correctly answered HIV Knowledge questions, 2 (12%) correctly identified HIV Risk Knowledge questions, and 4 (25%) correctly identified 5 of 6 HIV Risk Knowledge questions.

One hundred and twenty-five women represented the subset who would accept HIV testing because they felt that it would be of benefit to themselves and their baby. Of these women, 38 (30%) correctly identified the HIV Knowledge questions, 27 (22%) correctly identified the Risk Knowledge questions, and 48 (38%) correctly identified 5 of 6 of the Risk Knowledge questions.

When asked to identify the source through which they were informed about HIV, women ranked the media as their primary source (72%), followed by school (49%), government/public health initiatives (29%), and doctor's offices (21%). Despite 61% of the women indicating that

a discussion with a health professional (family physician 70%, obstetrician-gynecologist 55%, nurse 24%, other medical professional 3%, and any health professional 2%) was an important source of information, only 9% listed physicians as an important source. Women also felt that public health announcements/campaigns (59%) and informational booklets and/or videos on the subject (44%) would be methods by which to disseminate information.

DISCUSSION

A reasonable acceptance of HIV screening by pregnant women was obtained in this study (81%). This is similar to the 82% rate reported for the Ottawa region and the 76.6% rate for all of Ontario at the end of 2003.⁹ Unfortunately, this rate suggests that some HIV-positive pregnancies are being missed. Thus, perinatal transmission of HIV, although declining, still occurs.^{12,13}

In an attempt to identify factors that can influence pregnant women's decision-making with respect to prenatal HIV screening, several variables were explored. Women declined HIV testing, in part, because they felt they were not at risk for HIV seropositivity – this in the context of only 14% of the women correctly identifying questions regarding HIV transmission and only 18% correctly identifying risk factors for the acquisition of HIV. These data raise the possibility that women declining testing might not have the appropriate information regarding their own risk. Given that women were also less likely to accept HIV screening if they had been tested previously, they might believe that a previous negative test finding ensures that HIV will not be contracted in the future.

Women who accepted to be tested for HIV endorsed different reasoning for their decision making, with 66% indicating that the test would benefit themselves and their baby, and 36% indicating that they would have the test because their physician offered it. Irrespective of the reasons that women could identify for opting-in for HIV prenatal screening, again, for many, decisions were being made about prenatal HIV testing without optimal knowledge about HIV.

Decisions about HIV screening might be complicated further by potential barriers

related to socio-demographic factors, including language. In our survey, a greater proportion of immigrants declined testing. The latter finding is supported by previous studies.^{14,15} This suggests the existence of important cultural and language barriers to counseling and education regarding prenatal HIV screening that could potentially exclude many women at risk.

It should be noted that the sample size of women who declined HIV testing in our study was small (n=43). As health care professionals, the goal is to decrease the number of women declining such testing, however, it limits the types of analyses that can be conducted in order to ascertain women's decision-making processes. Given the sociopolitical nature of HIV, it is also possible that factors influencing decision-making could shift or be weighted differentially in other regions. Future research with a larger sample, obtained from more than one geographical region, would allow for the use of structural equation modeling.¹⁶ This could help to elucidate the underlying issues leading to different reasoning between groups for accepting and declining HIV screening.

Nonetheless, the data suggest that efforts must continue to be made to educate the public. Women indicated that their primary source for HIV information was through the media; however, they also indicated that they would prefer that information come from their health care provider. With increasing demands on physicians, providing adequate information/education on HIV in the context of prenatal care is difficult. Furthermore, providing information might not be sufficient. Rather, physicians might need to elicit the rationale as to why some women decline prenatal HIV screening, even with some knowledge about HIV transmission and its prevention. Conducting such counseling requires a significant amount of time from health care providers and this expectation may be difficult to achieve unless appropriate resources are made available and general public information/education is provided through multiple sources.

CONCLUSION

There remains a significant knowledge gap regarding issues related to HIV in general and its implication for the pregnant

woman and her baby. Women declining testing represent a subgroup with even lesser knowledge. This points to the need for urgent interventions, which should be aimed specifically at educating the population regarding risk factors for HIV transmission. Clear emphasis should be placed on heterosexual contact and the fetal-maternal benefits of antiretrovirals, as the data suggested that these were the two major issues in women's decision to decline or accept testing, respectively.

A public campaign on prenatal HIV screening and its benefits would likely be beneficial and interventions dealing with attitude changes should be contemplated in close collaboration with various communities so as to address the influence of possible socio-demographic or language barriers. These are necessary so that the offer of HIV screening does not remain the weakest link in the prevention of perinatal transmission.^{10,11,17}

REFERENCES

1. AIDS epidemic update – December 2002. Geneva: Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization. Report no: UNAIDS/02.46E, 2002.
2. Health Canada. HIV and AIDS in Canada: Surveillance Report to June 30, 2003. Surveillance and Risk Assessment Division, Epidemiology and Surveillance, Centre for Infectious Disease Prevention and Control, Public Health Agency of Canada, November 2003.
3. Ioannidis JPA, Abrams EJ, Ammann A, Bulterys M, Goedert JJ, Gray L, et al. Perinatal transmission of human immunodeficiency virus type 1 by pregnant women with RNA virus loads < 1000 copies/ml. *J Infect Dis* 2001;183(4):539-45.
4. Robinson JL, Lee BE. Prevention of perinatal transmission of HIV infection. *CMAJ* 2000;163(7):831-32.
5. Marseille E, Kahn JG, Miro F, Guay L, Musoke P, Fowler MG, Jackson JB. Cost effectiveness of single dose nevirapine regimen for mothers and babies to decrease vertical HIV-1 transmission in sub-Saharan Africa. *Lancet* 1999;354(9181):803-9.
6. Silverside A. With HIV prevalence among women increasing, more provinces encourage prenatal testing. *CMAJ* 1999;158:1518-19.
7. Silversides A. Ontario joins prenatal HIV-screening movement. *CMAJ* 1999;160(2):173-74.
8. Walmsley S. Opt in or opt out: What is optimal for prenatal screening for HIV infection. *CMAJ* 2003;168(6):279.
9. Remis RS. Tables of prenatal HIV testing in Ontario: Summary. Health Canada, Division of HIV/AIDS Epidemiology and Surveillance, Epidemiological Updates 2004, Perinatal Transmission of HIV. Available online at: http://www.phac-aspc.gc.ca/publicat/epi-u-ae/epi_update_may_04/7_e.html (Accessed March 26, 2006).
10. Wang F-L, Larke B, Gabos S, Hanrahan A, Schopflocher D. Potential factors that may affect acceptance of routine prenatal HIV testing. *Can J Public Health* 2005;96:60-64.
11. Kelly KA, Harrison CH. Universal prenatal HIV screening: Patient attitudes and perceptions. *Women & Health* 2004;40(1):41-57.
12. Bitnum A, King SM, Arneson C, Read SE. Failure to prevent perinatal HIV infection. *CMAJ* 2002;166(7):904-5.
13. Remis RS, King SM, Vernich L, Major C, Whittingham E. Epidemiologic modeling to evaluate prevention of mother-infant HIV transmission in Ontario. *JAIDS* 2003;34(2):221-30.
14. Jha S, Gee H, Coomarasamy A. Women's attitudes to HIV screening in pregnancy in an area of low prevalence. *B/OG* 2003;110:145-48.
15. Fernandez MI, Wilson TE, Ethier KA, Walter EB, Gay CL, Moore J. Acceptance of HIV testing during prenatal care. *Public Health Rep* 2000;115:460-68.
16. Kaplan D. *Structural Equation Modeling: Foundations and Extensions*. Newbury Park, CA: Sage Publications, 2000.
17. Steel O'Connor K, Macdonald SE. Aiming for zero: Preventing mother-to-child transmission of HIV. *CMAJ* 2002;166:909-10.

Received: June 14, 2006

Accepted: March 6, 2007

RÉSUMÉ

Contexte : Au Canada comme ailleurs dans le monde, les femmes représentent une proportion croissante des nouveaux cas de séropositivité pour le VIH¹. En 2002, les femmes comptaient pour 25 % des tests positifs pour le VIH déclarés au Canada²; la majorité de ces femmes étant en âge de procréer (15 à 39 ans), il y a lieu de craindre une transmission périnatale du VIH au pays². Depuis la mise au point de mesures de réduction efficaces du taux de transmission verticale, le dépistage prénatal du VIH est devenu la première étape, et la plus critique, dans la prévention de la transmission du virus de la mère à l'enfant³⁻⁵. Nous avons voulu analyser l'influence des connaissances et des attitudes des femmes à l'égard du VIH et du dépistage du VIH pendant la grossesse sur les taux de dépistage.

Méthode : Nous avons mené une enquête prospective anonyme auprès de 231 femmes fréquentant des cliniques de soins prénataux dans un hôpital d'enseignement universitaire ou une clinique communautaire.

Résultats : Dans l'ensemble, les femmes enceintes étaient en faveur du dépistage universel du VIH pendant la grossesse. Les femmes qui avaient déjà subi un test de dépistage du VIH et qui jugeaient ne pas être à risque de contracter le virus avaient plus tendance à refuser le test de dépistage pendant leur grossesse actuelle. Les connaissances générales du VIH et de sa transmission étaient sous-optimales, particulièrement chez les femmes qui avaient refusé le test de dépistage.

Conclusion : Les femmes qui refusent le test de dépistage prénatal du VIH n'ont pas le même niveau de connaissances que celles qui l'acceptent, surtout en ce qui a trait aux avantages du dépistage. C'est signe qu'il faut poursuivre les efforts d'information du public, mais aussi les mesures visant à changer les attitudes actuelles.