

HY Tse 謝喜兒
FK Lai 賴鳳琼
J Wong 王玉英
ASM Chan 陳淑雯
LCH Tang 鄧燦洪

Universal screening of human immunodeficiency virus infection in pregnant women in Hong Kong: prospective study

香港孕婦中人類免疫缺陷病毒傳染病的篩查：預期研究

Objective. To evaluate universal screening with an opt-out approach of pregnant women for human immunodeficiency virus infection.

Design. Prospective study.

Setting. Regional hospital, Hong Kong.

Patients. All women booked or delivered in Kwong Wah Hospital from 1 January 1999 to 30 November 1999 were recruited.

Main outcome measures. Numbers of women who received the human immunodeficiency virus antibody screening test, refused the test (and the reasons why), tested positive, and tested positive with confirmation by immunoblot study.

Results. A total of 5597 women were recruited and 5459 screening tests performed in this study. Of the 16 screened positive cases, three were confirmed by immunoblot study. The overall acceptance rate for the test was 97.5%. The acceptance rate among the 5191 women recruited through the hospital's booking clinic was not significantly different from that among the 406 women who did not go through the hospital's booking clinic (97.6% versus 96.6%).

Conclusion. Universal screening of pregnant women for human immunodeficiency virus infection with an opt-out approach is practical, feasible, and clinically acceptable in Hong Kong.

Key words:

*Disease transmission, vertical;
HIV infections/transmission;
Hong Kong;
Prenatal care*

關鍵詞：

疾病傳播，垂直的；
人類免疫缺陷病毒傳染病／傳播；
香港；
出生前護理

HKMJ 2001;7:246-50

Department of Obstetrics and Gynaecology,
Kwong Wah Hospital, 25 Waterloo Road,
Kowloon, Hong Kong

HY Tse, MRCOG, FHKAM (Obstetrics and
Gynaecology)

FK Lai, BSc

J Wong, BSc, AIBMS

ASM Chan, MB, BS, MRCOG

LCH Tang, FRCOG, FHKAM (Obstetrics and
Gynaecology)

Correspondence to: Dr HY Tse

目的：評估使用選擇淘汰法篩查孕婦的人類免疫缺陷病毒傳染病。

設計：預期研究。

安排：香港，地區醫院。

患者：1999年1月1日至11月30日在廣華醫院登記分娩的所有婦女。

主要結果測量：婦女接受人類免疫缺陷病毒抗體檢測的人數，拒絕檢測的人數(和原因)，結果呈陽性的人數，及由免疫塗片研究確認的呈陽性結果的人數。

結果：本研究調查的婦女總數為5597名，其中5459名進行了檢測。16個呈陽性結果的檢測中，3名經免疫塗片研究確認。該檢測總接受率為97.5%。經醫院登記就診的5191名婦女和未經醫院登記就診的406名婦女之間的接受率無明顯差別(97.6% 相對 96.6%)。

結論：在香港利用選擇淘汰法篩查孕婦是否感染人類免疫缺陷病毒是實用、可行、及臨床可接受的方法。

Introduction

In terms of human immunodeficiency virus (HIV) infection, Hong Kong is a low prevalence area compared with its neighbours in South-East

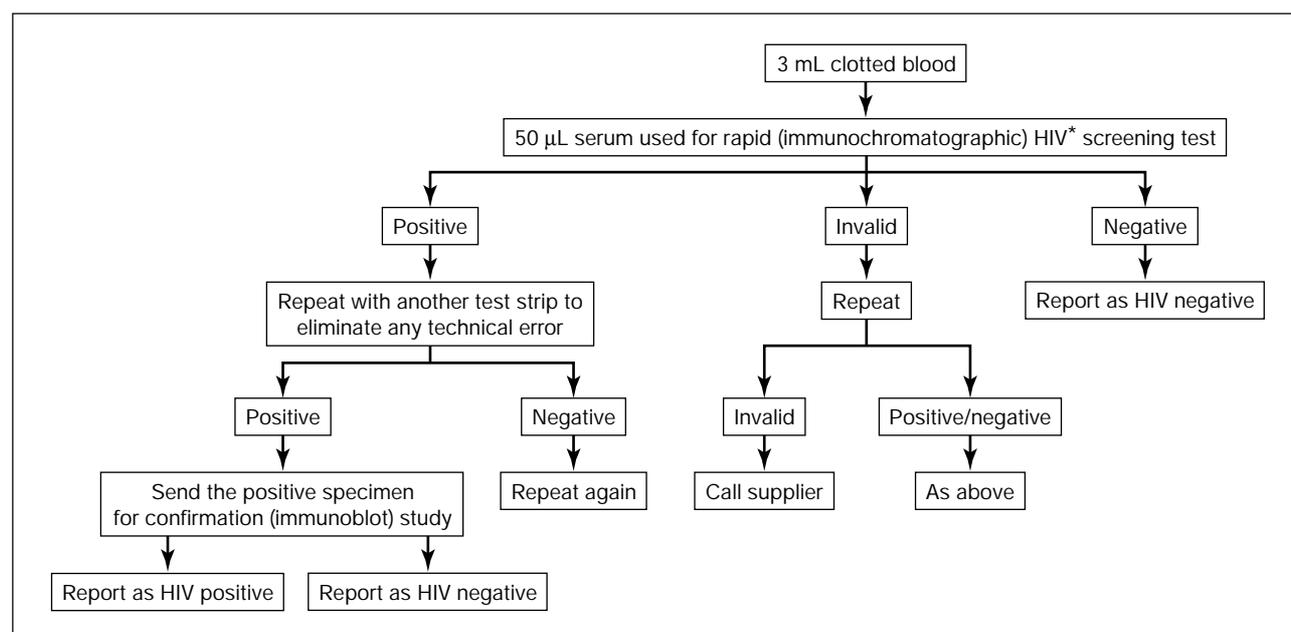
Asia.¹ In recent years, unlinked anonymous screening has shown a prevalence of 0.03% in local neonates.² Current practice in Hong Kong maternity clinics is to offer selective screening to pregnant women identified to be at risk for HIV infection. A selective approach, however, is likely to result in failure to identify all women with HIV infection.³ Indeed, a retrospective study conducted in Hong Kong revealed that 80% of mothers were found to be infected with HIV only after diagnosis of their babies with the infection.⁴ With the development of useful strategies to prevent mother-to-child transmission of HIV infection,⁵ it is necessary to evaluate whether a universal screening approach is applicable to allow early identification of pregnant women infected with HIV⁶ for implementation of effective preventive measures.⁷

Methods

This study was carried out from 1 January 1999 to 30 November 1999 and recruited all women booked or delivered in Kwong Wah Hospital, Hong Kong. Study approval was obtained beforehand from the Ethics Committee of the hospital. During attendance at the booking clinic, all pregnant women were provided with an information pamphlet available in both Chinese and English languages. The pamphlet included a brief explanation of the disease, the various modes of transmission including perinatal transmission, the existence of effective measures for reducing perinatal transmission, and the implications of a positive/negative HIV test, including the possibility of a 'window' period.

The women were also informed of the nature of the clinical research. Most importantly, the option of refusing to take the test was highlighted. Pretest group counselling conducted by a nurse specialist was incorporated into the regular counselling sessions for women attending the hospital's maternity clinic for the first time. Again, the women were informed that they had the right to refuse the screening test if they so wished. In the event that a woman did refuse to take the HIV test, her reason(s) were recorded by a research assistant. Venepuncture was performed by an experienced nurse.

The procedure followed for women consenting to HIV infection screening is summarised in the Fig. Briefly, an extra 3 mL of blood was taken in addition to the usual 7 mL for routine antenatal blood tests including a complete blood count, blood group, immune status for rubella and hepatitis B, and a screening test for syphilis. The extra 3 mL of blood were then centrifuged and 50 µL of serum used for the HIV antibody test (Determine HIV 1/ HIV 2 test, Abbott Laboratories Ltd, Illinois, US).⁸ Patients with negative screening results were told of the same in the subsequent visit, together with the results of their routine antenatal blood tests. If, however, a patient tested positive, her remaining serum was sent for confirmation immunoblot study. If HIV infection was confirmed in this manner, she was immediately informed of this fact by the principal investigator and then referred to the special preventive programme of the Department of Health of Hong Kong for comprehensive management. Joint management



* HIV human immunodeficiency virus

Fig. Protocol for human immunodeficiency virus infection screening (and confirmation) in pregnant women in this study

between Department of Health and Kwong Wah Hospital would be undertaken for the remainder of the pregnancy. Women who had a positive screening result not confirmed by immunoblot study had this outcome explained to them in their subsequent visit by one of the doctors in the project team. Repeat screening was arranged after delivery.

A small percentage of the patients in this study did not go through the antenatal booking clinic. These women were either admitted to the delivery suite without booking or had already been booked elsewhere. Notwithstanding, these women were given the information pamphlet and offered the HIV screening test by the attending midwife.

Results

A total of 5597 women were recruited in this study. Of the 5191 women who attended the antenatal clinic for booking ('booked cases'), 5067 (97.6%) accepted the HIV test, whereas 124 (2.4%) women declined the test. Of the 406 women who did not go through the antenatal booking clinic ('non-booked cases'), 392 (96.6%) accepted the HIV test, whereas 14 (3.4%) refused the test. The acceptance rate in the booked group was thus slightly higher (by 1%), although this difference was not statistically significant (Chi squared test). Overall, 2.5% of the studied population refused to take the HIV test. The reasons for refusal are listed in the Table.

Of the 5597 women recruited, 5177 (92.5%) were Chinese and 420 (7.5%) were non-Chinese. The acceptance rate in the Chinese group was slightly lower than that in the non-Chinese group (97.4% versus 98.8%), although this difference was not statistically significant. Among the 406 non-booked cases, there were only 14 (3.4%) non-Chinese women and they all accepted the HIV test.

Table. Reasons of refusing a human immunodeficiency virus test

Reason	n=138 No. (%)
Considered herself not at risk or at low risk of infection	36 (26.1)
Considered the test unnecessary	28 (20.3)
Had been screened before	27 (19.6)
Did not want to have extra blood taken	20 (14.5)
Feared pain	5 (3.6)
Did not want to have this test	2 (1.5)
Did not want to know the test result	1 (0.7)
Husband disagreed	1 (0.7)
Refused all antenatal routine tests	1 (0.7)
Reason(s) not documented	17 (12.3)

Three screened patients (one Chinese, two non-Chinese) were found to have HIV infection during the course of this study. The HIV infection detection rate was thus 1 in 1820 (0.05%). The Chinese woman with confirmed HIV infection did not have any identifiable risk factors and, for the other two patients, their only risk factor was their non-Chinese ethnicity. Thirteen patients had a positive screening test but negative immunoblot study. The false positive rate was thus 0.24%.

Discussion

The overall acceptance rate of HIV testing in this large sample of pregnant women who were booked or delivered at Kwong Wah Hospital was 97.5%. High acceptance of universal screening of pregnant women with an opt-out approach has previously been reported in another area with a low prevalence of HIV infection, namely Sweden.⁹ The rate in this study is, however, still much higher than that reported in other studies.^{10,11} Taking blood for the HIV screening test at the same time as for routine antenatal tests may contribute to the high uptake, as no extra venepuncture is needed. Ease and accessibility of HIV screening has been found to be an important factor in a high uptake of prenatal HIV screening.¹² It has also been observed that the pregnant population is a more compliant group towards screening programmes.¹³ Local data, for example, show that there was also a high uptake of Down's syndrome screening after this was first introduced in Hong Kong in the mid 1990s.^{14,15} Universal screening for HIV infection with an opt-out approach for patients attending the Social Hygiene Clinic (the referral centre for patients with sexually transmitted diseases in Hong Kong) has also been adopted.

Hong Kong is still an area with a low prevalence of HIV infection, although there is no room for complacency as the prevalence of HIV infection is actually increasing.¹⁶ Our territory is an extremely busy international travel destination. In 1996, the number of passengers to and from Hong Kong was 99.8 million.¹⁷ A rising trend of HIV infection is thus expected and, moreover, is in fact being recorded.² With a population reaching 7 million, the cumulative number of reported HIV infections is 1542 since the first reported case in 1985.¹⁸ In addition, there is a steady increase in female HIV infection, resulting in a narrowing of the male to female infection ratio, from 7.8:1 in 1992 to 3.2:1 in 2000.¹⁸ Furthermore, late presentation of patients with HIV infection is a persistent phenomenon. It is perhaps not surprising then, that a retrospective

review found that 80% of mothers with HIV infection were identified only after the diagnosis had been made in their babies.⁴ It is also an indication that the current practice of selectively screening pregnant women for HIV infection is not an effective strategy. In this study, the three pregnant women with HIV infection would probably not have been detected by the selective screening approach, as one did not have any identifiable risk factors and, for the other two, their only risk factor was non-Chinese ethnicity.

The prevalence of HIV infection in this study population was 5.5 per 10 000 pregnancies. With an annual local birth rate of 65 000, it is estimated that approximately nine babies would acquire the infection through vertical transmission with the assumption of a transmission rate of approximately 25%. There is evidence that mother-to-child transmission of HIV can be substantially reduced through appropriate interventions, such as zidovudine administration in the antepartum and intrapartum period.^{5,7} Hence knowledge of pregnant women's sero-status becomes a prerequisite in any such attempt to reduce HIV infection in children. It has also been shown that women who knew that they had HIV infection all acted in a fashion to reduce vertical transmission.¹⁹ Given the high acceptance for universal screening in this pregnant population, consideration should be given to the implementation of territory-wide universal screening in Hong Kong. For more than 10 years, universal screening of HIV infection with an opt-out approach has been adopted in Scandinavian countries, such as Sweden⁹ where the incidence of HIV infection is relatively low. Closer to home, the Ministry of Health in Malaysia²⁰ (where the incidence of HIV infection is quite similar to that in Hong Kong) has, since 1998, adopted a similar approach of routine antenatal screening. The following year, an intercollegiate working party report in the United Kingdom acknowledged that their country lagged behind others in preventing vertical transmission of HIV infection and recommended that HIV testing be available in all antenatal clinics.²¹

Conclusion

The results of this study carried out at the Kwong Wah Hospital suggest that universal screening of pregnant woman for HIV infection with an opt-out approach is practical, feasible, and clinically acceptable.

Acknowledgement

This study received support from the Council for the AIDS Trust Fund of Hong Kong.

References

- Schwartlander B, Stanecki KA, Brown T, et al. Country-specific estimates and models of HIV and AIDS: methods and limitations. *AIDS* 1999;13:2445-58.
- Editorial. Hong Kong STD/AIDS update—a quarterly surveillance report. Department of Health, Hong Kong 2001; 7:1.
- MacDonagh SE, Masters J, Helps BA, Tookey PA, Ades AE, Gibb DM. Descriptive survey of antenatal HIV testing in London: policy, uptake, and detection. *BMJ* 1996;313: 532-3.
- Mother to child transmission of HIV. Hong Kong STD/AIDS update—a quarterly surveillance report. Department of Health, Hong Kong 2000;6:8.
- Brocklehurst P. Interventions aimed at decreasing the risk of mother-to-child transmission of HIV infection (Cochrane Review). In: *The Cochrane Library*, 2, 2001. Oxford: Update Software.
- Newell ML. Mechanisms and timing of mother-to-child transmission of HIV-1. *AIDS* 1998;12:831-7.
- Connor EM, Sperling RS, Gelber R, et al. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. Pediatric AIDS Clinical Trials Group Protocol 076 Study Group. *N Engl J Med* 1994;331:1173-80.
- Hiroyasu A, Kobayashi Y, Groff J, et al. A rapid immunochromatographic method for the detection of HIV antibodies. *Proceedings of the 4th International Congress on AIDS in Asia and the Pacific*; 1997 Oct 25-29; Manila, Philippines.
- Lindgren S, Bohlin AB, Forsgren M, et al. Screening for HIV-1 antibodies in pregnancy: results from the Swedish national programme. *BMJ* 1993;307:1447-51.
- Rey D, Carrieri MP, Obadia Y, Pradier C, Moatti JP. Mandatory prenatal screening for the human immunodeficiency virus: the experience in south-eastern France of a national policy, 1992-1994. *Br J Obstet Gynaecol* 1998;105:269-74.
- Limata C, Schoen EJ, Cohen D, Black SB, Quesenberry CP Jr. Compliance with voluntary prenatal HIV testing in a large health maintenance organization (HMO). *J Acquir Immune Defic Syndr Hum Retrovirol* 1997;15:126-30.
- Simpson WM, Johnstone FD, Boyd FM, Goldberg DJ, Hart GJ, Prescott RJ. Uptake and acceptability of antenatal HIV testing: randomised controlled trial of different methods of offering the test. *BMJ* 1998;316:262-7.
- Thornton JG, Hewison J, Lilford RJ, et al. A randomised trial of three methods of giving information about prenatal testing. *BMJ* 1966;312:508.
- Lam YH, Ghosh A, Tang MH, et al. Second-trimester maternal serum alpha-fetoprotein and human chorionic gonadotrophin screening for Down's syndrome in Hong Kong. *Prenatal Diagn* 1998;18:585-9.
- Yuen COS, Sin SY, Ghosh A, Tang LCH. Organization of a biochemical screening programme for Down's Syndrome at Kwong Wah Hospital. *Proceedings of the 2nd Asian Pacific Regional Meeting of the International Society for Neonatal Screening*; 1995.
- Lin P, Jiang L, Zeng C, et al. HIV epidemiology, trends and control policies in Guangdong Province. *Proceedings of the Hong Kong AIDS Conference*; 1996.
- Human mobility and HIV/STD in Hong Kong. Hong Kong STD/AIDS Update—a quarterly surveillance report, Department of Health, Hong Kong 1997;3:8.

18. Chan CN. An overview of HIV infection and AIDS in Hong Kong. Hong Kong STD/AIDS update—a quarterly surveillance report, Department of Health, Hong Kong 2001;7:6-10.
19. Lyall EG, Stainsby C, Taylor GP, et al. Review of uptake of interventions to reduce mother to child transmission of HIV by women aware of their HIV status. *BMJ* 1998;316:268-70.
20. Antenatal screening in Malaysia. AIDS/SID Section, Division of Disease Control, Department of Public Health, Ministry of Health, Malaysia.
21. Reducing mother to child transmission of HIV infection in the United Kingdom. Recommendations of an Intercollegiate Working Party for enhancing voluntary confidential HIV testing in pregnancy. Royal College of Paediatrics and Child Health; 1998 April; London.

THE UNIVERSITY OF HONG KONG



The University of Hong Kong is a leading international comprehensive research university in the Asia-Pacific region, with more than 100 teaching departments and sub-divisions of studies and learning, and more than 60 research institutes and centres. There is currently an enrolment of more than 17,000 students (6,500 at postgraduate level). Research students are from more than 48 countries. The medium of instruction is English. The University is committed to its vision of globalisation, together with excellence in scholarship and research.

**Clinical Associate Professor in Hepatology
(Ref.: RF-2000/2001-248)**

Applications are invited for appointment as Clinical Associate Professor (in the grade of Clinical Senior Lecturer) in Hepatology in the Department of Medicine, tenable from as soon as possible. The appointment will initially be made on a fixed-term basis of three years.

The Department of Medicine aims to produce doctors equipped to practise medicine of the highest standard and in the best interests of their patients and the community, and to inspire them to strive for and achieve academic excellence.

Applicants should possess a medical qualification registrable in Hong Kong and an M.R.C.P. (U.K.) or equivalent, and have completed training in Hepatology. Ability to speak Cantonese is an advantage although teaching, research and professional work are conducted in English. The appointee is expected to participate in the delivery of the undergraduate and postgraduate programmes in Hepatology to conduct research and to work with the hospital clinical staff to provide quality health care to the community.

Monthly salary [attracting 15% (taxable) terminal gratuity] is on an 11-point scale, with starting salary depending on qualifications and experience: HK\$116,650 – 135,550.

The appointment carries leave, medical and dental benefits, and a monthly cash allowance subject to the Rules on Prevention of Double Benefits on Housing (current rates available on the University's web at <http://www.hku.hk/apptunit/ha-allowance.html>).

Further particulars and application forms can be obtained at <http://www.hku.hk/apptunit/>; by **fax** (2540 6735 or 2559 2058); **e-mail** (apptunit@reg.hku.hk); directly from the Staffing Section, Registry, Room 1001, Knowles Building; or by **writing** to the Appointments Unit (Senior), Registry, The University of Hong Kong, enclosing a \$1.30 stamped self-addressed envelope. **Closes September 28, 2001.**

The University is an equal opportunity employer and enjoys a smoke-free environment