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

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.

Introduction

In terms of human immunodeficiency virus (HIV) infection, Hong Kong is a low prevalence area compared with its neighbours in South-East East.
Asia. In recent years, unlinked anonymous screening has shown a prevalence of 0.03% in local neonates. 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. 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. With the development of useful strategies to prevent mother-to-child transmission of HIV infection, it is necessary to evaluate whether a universal screening approach is applicable to allow early identification of pregnant women infected with HIV for implementation of effective preventive measures.

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). 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

3 mL clotted blood

50 µL serum used for rapid (immunochromatographic) HIV* screening test

Positive

Repeat with another test strip to eliminate any technical error

Positive

Send the positive specimen for confirmation (immunoblot) study

Negative

Repeat

Invalid

Call supplier

Repeat again

As above

Positive/negative

Report as HIV negative

Negative

Report as HIV positive

Invalid

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.

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.5 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

<table>
<thead>
<tr>
<th>Reason</th>
<th>n=138 No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considered herself not at risk or at low risk of infection</td>
<td>36 (26.1)</td>
</tr>
<tr>
<td>Considered the test unnecessary</td>
<td>28 (20.3)</td>
</tr>
<tr>
<td>Had been screened before</td>
<td>27 (19.6)</td>
</tr>
<tr>
<td>Did not want to have extra blood taken</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Feared pain</td>
<td>5 (3.6)</td>
</tr>
<tr>
<td>Did not want to have this test</td>
<td>2 (1.5)</td>
</tr>
<tr>
<td>Did not want to know the test result</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Husband disagreed</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Refused all antenatal routine tests</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Reason(s) not documented</td>
<td>17 (12.3)</td>
</tr>
</tbody>
</table>
review found that 80% of mothers with HIV infection were identified only after the diagnosis had been made in their babies. 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. 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. 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 Sweden where the incidence of HIV infection is relatively low. Closer to home, the Ministry of Health in Malaysia (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.

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

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References

20. Antenatal screening in Malaysia. AIDS/SID Section, Division of Disease Control, Department of Public Health, Ministry of Health, Malaysia.

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