# An audit of obstetricians' management of women potentially infected with blood-borne viruses

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## ABSTRACT

***Objective:*** To assess obstetricians' current antenatal screening practices for blood-borne viruses (hepatitis B, hepatitis C and HIV) and how they manage pregnant women infected with a blood-borne virus.

***Design and participants:*** National cross-sectional survey conducted between September 2002 and January 2003. All obstetricians ($n = 767$) registered with the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) were mailed a questionnaire assessing their antenatal screening practices and knowledge of management of women potentially infected with a blood-borne virus.

***Outcome measures:*** Concordance of clinical practice with RANZCOG recommendations and current evidence-based guidelines.

***Results:*** 523 obstetricians (68% response rate) completed the questionnaire. Fifty-one per cent of respondents said they would always offer HIV screening and 60% would always offer HCV screening. For HIV-infected women, 36% of obstetricians would always recommend elective caesarean section and 33% would always avoid rupture of membranes. Despite a lack of evidence, 34% of obstetricians advise patients that the risk of HBV transmission is increased with breastfeeding, and 47% give the same advice about HCV transmission.

***Conclusion:*** There is some discordance between the RANZCOG antenatal screening recommendations for HCV and HIV and current practice. Knowledge about the management of HIV-infected women could be improved, and more obstetricians need to be aware that current evidence suggests there is no increased risk of transmission of HBV or HCV with breastfeeding.


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A HIGH PROPORTION OF WOMEN who are infected with blood-borne viruses such as hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV are in their childbearing years. There has been debate in the literature about the issue of antenatal screening for HIV in Australia[1] and about the variability of recommendations in Australian protocols and national policies about screening for HCV and HIV.[2] An important first step in addressing these issues is to examine current practices of obstetricians in Australia and to compare these with current recommendations (for a summary of principal recommendations see Box 4). The purpose of our project was to audit current antenatal screening practices for HBV, HCV and HIV; to assess knowledge regarding interventions during labour that may influence vertical transmission; and to assess knowledge regarding transmission via breastfeeding.

## METHODS

Between September 2002 and January 2003, we conducted a cross-sectional study of obstetricians' management of women potentially infected with a blood-borne virus. A questionnaire was mailed to 767 obstetricians registered with the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Non-respondents at 6 weeks were mailed a further copy of the questionnaire, a reply-paid envelope and a modified letter of introduction.

The questionnaire was designed by an epidemiologist, an infectious diseases physician and an obstetrician. It was piloted among a group of obstetricians and modified based on their feedback. Demographic data were collected, including age, sex, state of registration, type of practice (private, public, or a combination), proportion of obstetrics and gynaecology (obstetrics only, gynaecology only, or a combination), and average number of deliveries in the past 12 months.

***Statistical analysis.*** Statistical analysis involved standard frequency tests and $\chi^2$ tests using an SPSS statistical program.[3]

***Ethics approval.*** According to guidelines developed by the Clinical Ethics Advisory Group and the Research Ethics Committee of the Royal Women's Hospital, our study did not require formal ethics approval, as it was an audit of current practice rather than a clinical research project.


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**1: Number of obstetricians currently conducting antenatal screening for blood-borne viruses**

| | Always | Usually | Sometimes | Rarely | Never | Unknown |
|---|---|---|---|---|---|---|
| Do you routinely screen for HBV? | 491 (96.8%) | 8 (1.6%) | 2 (0.4%) | 3 (0.6%) | 1 (0.2%) | 2 (0.4%) |
| Do you routinely ask about risk factors for exposure to HBV? | 106 (20.9%) | 81 (16%) | 116 (22.9%) | 138 (27.2%) | 55 (10.8%) | 11 (2.2%) |
| Do you routinely screen for HCV? | 302 (59.6%) | 52 (10.3%) | 97 (19.1%) | 31 (6.1%) | 21 (4.1%) | 4 (0.8%) |
| Do you routinely ask about risk factors for exposure to HCV? | 102 (20.1%) | 115 (22.7%) | 118 (23.3%) | 113 (22.3%) | 48 (9.5%) | 11 (2.2%) |
| Do you routinely screen for HIV? | 256 (50.5%) | 67 (13.2%) | 101 (19.9%) | 56 (11%) | 23 (4.5%) | 4 (0.8%) |
| Do you routinely ask about risk factors for exposure to HIV? | 96 (18.9%) | 112 (22.1%) | 129 (25.4%) | 102 (20.1%) | 57 (11.2%) | 11 (2.2%) |

HBV = hepatitis B virus. HCV = hepatitis C virus.

## RESULTS

Of the 767 obstetricians sent questionnaires, 523 responded (68% response rate). Sixteen questionnaires were excluded from the analysis because the obstetrician had retired or was involved in non-clinical practice only. Every state and territory in Australia was represented (results not given here).

***Antenatal screening and assessment of risk factors.*** Current antenatal screening practices and the level of assessment of risk factors for exposure to blood-borne viruses are summarised in Box 1. Although 97% of obstetricians said they would always screen pregnant women for HBV, only 51% always offered screening for HIV and 60% always offered screening for HCV.

Only about 20% of obstetricians claimed that they always ask pregnant women about risk factors for exposure to blood-borne viruses.

***Clinical management.*** Aspects of clinical management of pregnant women with blood-borne viruses are summarised in Box 2. The majority of obstetricians said they would usually or always avoid fetal scalp monitoring in women with HBV, HCV or HIV. Of note, only 36% of respondents said they would always recommend elective caesarean section to HIV-infected women, and only 33% would always avoid rupture of membranes.

***Risk of viral transmission through breastfeeding.*** Asked whether they would discuss the risk of viral transmission through breastfeeding with a patient who had a blood-borne virus, the proportion of obstetricians who claimed they would always do so was 55% (for HBV), 67% (for HCV) and 82% (for HIV). Despite a lack of evidence, 34% of respondents would advise women that breastfeeding is associated with an increased risk of HBV transmission, and 47% would advise women of an increased risk of HCV transmission with breastfeeding (Box 3).

## DISCUSSION

Our survey is the largest study to date to assess the current knowledge and practice of Australian obstetricians in relation to women infected with blood-borne viruses. The current "best practice" for blood-borne virus screening in pregnant women is far from clear, with wide variation across Australia.[2] There is some discordance between current antenatal screening practice and the RANZCOG recommendations.[4] The possible reasons for this may include a lack of knowledge of the RANZCOG guidelines and/or a belief by some clinicians that current guidelines do not reflect best practice. The variation in recommendations according to virus type may also cause some confusion.

***HBV.*** The screening and clinical management of women infected with HBV is in keeping with current guidelines (Box 4). However, it is of concern that a substantial proportion of obstetricians are giving incorrect advice about the risk of transmission through breastfeeding.

***HCV.*** It is noteworthy that obstetricians were more likely to screen pregnant women for HCV than for HIV, despite less evidence for the effectiveness of interventions to reduce perinatal transmission of HCV.

This may be because of presumed higher seroprevalence of HCV in the community (the current seroprevalence

**2: Clinical management by obstetricians of pregnant women with a blood-borne virus**

| | | Always | Usually | Sometimes | Rarely | Never | Unknown | Missing data |
|---|---|---|---|---|---|---|---|---|
| HBV | Would you recommend elective caesarean section? | 0 | 4 (0.8%) | 30 (5.9%) | 117 (23.1%) | 345 (68.0%) | 5 (1.0%) | 6 (1.2%) |
| | Would you avoid fetal scalp monitoring? | 198 (39.1%) | 149 (29.4%) | 19 (3.7%) | 34 (6.7%) | 94 (18.5%) | 6 (1.2%) | 7 (1.4%) |
| | Would you avoid rupture of membranes? | 11 (2.2%) | 53 (10.5%) | 47 (9.3%) | 120 (23.7%) | 263 (51.9%) | 7 (1.4%) | 6 (1.2%) |
| HCV | Would you recommend elective caesarean section? | 7 (1.4%) | 6 (1.2%) | 41 (8.1%) | 142 (28.0%) | 287 (56.6%) | 20 (3.9%) | 4 (0.8%) |
| | Would you avoid fetal scalp monitoring? | 232 (45.8%) | 131 (25.8%) | 27 (5.3%) | 27 (5.3%) | 66 (13.0%) | 15 (3.0%) | 9 (1.8%) |
| | Would you avoid rupture of membranes? | 18 (3.6%) | 71 (14.0%) | 55 (10.8%) | 101 (19.9%) | 235 (46.4%) | 22 (4.3%) | 5 (1.0%) |
| HIV | Would you recommend elective caesarean section? | 184 (36.3%) | 78 (15.4%) | 48 (9.5%) | 45 (8.9%) | 86 (17.0%) | 54 (10.7%) | 12 (2.4%) |
| | Would you avoid fetal scalp monitoring? | 308 (60.7%) | 70 (13.8%) | 9 (1.8%) | 10 (2.0%) | 39 (7.7%) | 48 (9.5%) | 23 (4.5%) |
| | Would you avoid rupture of membranes? | 165 (32.5%) | 84 (16.6%) | 27 (5.3%) | 39 (7.7%) | 113 (22.3%) | 57 (11.2%) | 22 (4.3%) |

HBV = hepatitis B virus. HCV = hepatitis C virus.

**3: Obstetricians' advice to women about the risk of transmitting a blood-borne virus through breastfeeding**

| | Inform her the risk is increased | Inform her the risk is uncertain | Inform her the risk is not increased | Unknown or missing data |
|---|---|---|---|---|
| HBV | 170 (33.5%) | 86 (17%) | 215 (42.4%) | 36 (7.1%) |
| HCV | 236 (46.5%) | 145 (28.6%) | 95 (18.8%) | 31 (6.1%) |
| HIV | 430 (84.8%) | 34 (6.7%) | 3 (0.6%) | 40 (7.9%) |

HBV = hepatitis B virus. HCV = hepatitis C virus.

of HIV in the unscreened antenatal population is unknown). Alternatively, obstetricians may see pregnancy as an opportunity to identify asymptomatic women before the development of long-term complications of HCV infection, such as cirrhosis and hepatocellular carcinoma. Effective treatment options, which are more likely to be successful if commenced before the development of cirrhosis, are now available and can be considered for many HCV-infected women after pregnancy and breastfeeding.[15]

Studies have shown that up to 40% of women found to be HCV-positive during pregnancy screening have no identifiable risk factor. Universal screening would assist in identifying these women.[16] Furthermore, during the postpartum period women may be more likely to attend follow-up appointments and adhere to treatment.[17] The disadvantages of a universal screening approach include the cost to the healthcare system of testing all women, given that there is little evidence that intervening during pregnancy affects the rate of vertical transmission. Moreover, seroprevalence is low in Australian women (11 per 1000[18]), and no cost-effectiveness studies have been undertaken.

The rate of vertical transmission of HCV from mother to child is about 6%,[19] but the timing and mode of vertical transmission and the best management strategy to reduce it are currently unclear. The role of caesarean section in reducing the rate of vertical transmission is uncertain, with studies producing conflicting results.[20,21] Our results reflect obstetricians' caution in this respect, with only a small proportion always offering elective caesarean section to women infected with HCV.

Similarly, our respondents were cautious about performing fetal scalp monitoring. Although it has been reported that such interventions may have the potential to increase vertical transmission of HCV,[22] this has never been adequately assessed in prospective, randomised controlled trials. Nevertheless, it may be prudent to avoid fetal scalp monitoring if there are other, equally effective non-invasive means of monitoring the neonate.

As with HBV, a substantial proportion of obstetricians are giving incorrect advice about the risk of transmission of HCV through breastfeeding. HCV RNA has been found in breastmilk by some investigators[23] but not by others.[24-26] Despite the theoretical risk of transmission, there is no evidence that breastfeeding increases the risk of transmission of HCV from mother to child.[26,27]

***HIV.*** Despite RANZCOG guidelines recommending universal screening for HIV, only about half of the respondents said they would always screen for HIV. Obstetricians may have a number of concerns about routinely offering HIV screening: the cost to the healthcare system of screening for an infection with low seroprevalence in Australia, the management issue of false-positive results and potential psychological harm this may cause, and the time constraints that may limit appropriate pre- and post-test counselling. A cost–benefit analysis of antenatal HIV screening in Australia (to our knowledge, the only one of its kind) used a model to predict the cost per life-year gained at many prevalences and then assumed a life-year gained was worth $39 000. Based on this figure, the minimum prevalence at which universal antenatal screening for HIV would be cost-effective is 0.004372% (Dr Nick Graves, Senior Research Fellow in Health Economics, School of Public Health, Queensland University of Technology, personal communication).

Transmission of HIV-1 infection from mother to child usually occurs around the time of delivery, largely intrapartum.[28] Although there is clear evidence that elective caesarean section is associated with reduced perinatal transmission of HIV,[9,29] only 36% of respondents said they would always recommend an elective caesarean section to a pregnant woman infected with HIV. Some obstetricians may not always offer caesarean section because they are uncertain whether caesarean delivery offers any additional benefit in reducing transmission in women who are receiving antiretroviral therapy and have undetectable viral loads. However, transmission has been reported in women with viral loads of less than 1000 copies/mL.[30]

Longer duration of ruptured membranes has been consistently associated with increased vertical transmission of HIV in women not receiving antiretroviral therapy.[31-33] However, in the era of combination antiretroviral therapy and low maternal viral load, the additional risk of ruptured membranes and duration required to increase transmission risk is unknown. This may explain why many obstetricians would *not* always avoid rupture of membranes in a woman infected with HIV.

***Study limitations.*** One of the limitations of our study was the fact that, because of privacy restrictions, we could not obtain demographic information about non-responders. Although this limits our ability to conclude that the responders are representative of obstetricians as a whole, we feel this is to some extent counteracted by the relatively high response rate and the fact that every state and territory in Australia was represented.

A second limitation of our study was that we did not directly ask obstetricians whether they had managed women with a known blood-borne virus infection. It would have been useful to correlate whether the obstetricians whose responses were consistent with current evidence-based guidelines were in fact those who had had experience in managing such women during pregnancy.

**4: Key findings and recommendations**

| | Screening | | Clinical management* | | Breastfeeding | |
|---|---|---|---|---|---|---|
| | Current practice | Recommendation/ guideline | Current practice | Recommendation/guideline | Current practice | Recommendation/guideline |
| HBV | 97% of obstetricians would always screen pregnant women for HBV | Offer HBV screening to all pregnant women[4] | 68% of obstetricians would never recommend elective caesarean section in HBV-infected women | Caesarean section is not recommended in HBV-infected women. Provided the neonate receives HBV vaccination and immunoglobulin at birth, there is no evidence that caesarean section significantly reduces perinatal transmission[5†] | 33.5% of obstetricians would advise women of an increased risk of HBV transmission with breastfeeding | There is no evidence that breastfeeding increases the risk of HBV transmission provided the neonate receives HBV vaccination and immunoglobulin at birth[6] |
| HCV | 60% of obstetricians would always screen pregnant women for HCV | Consider offering HCV screening to all pregnant women[4] | 57% of obstetricians would never recommend elective caesarean section in HCV-infected women | Caesarean section is not recommended in HCV-infected women[7‡] | 46.5% of obstetricians would advise women of an increased risk of HCV transmission with breastfeeding | There is no evidence that breastfeeding increases the risk of HCV transmission[8] |
| HIV | 50% of obstetricians would always screen pregnant women for HIV | Offer HIV screening to all pregnant women after appropriate pretest counselling[4] | 36% of obstetricians would always offer elective caesarean section to HIV-infected women | Elective caesarean section in HIV-infected women with viral loads > 1000 copies/mL reduces perinatal transmission[9] | Almost 85% of obstetricians would advise women of an increased risk of HIV transmission with breastfeeding | Breastfeeding is associated with an increased risk of HIV transmission. In developed countries, women should be informed of this and told of alternative methods of infant feeding[10] |
| | | | 33% of respondents would always avoid rupture of membranes in HIV-infected women | Prolonged rupture of membranes (> 4 h) has been associated with increased perinatal transmission[11] | | |

HBV = hepatitis B virus. HCV = hepatitis C virus. RANZCOG = Royal Australian and New Zealand College of Obstetricians and Gynaecologists.

* There is a paucity of data regarding any increased risk of transmission of HBV or HCV with prolonged rupture of membranes or fetal scalp monitoring. The RANZCOG specifies in guidelines for intrapartum fetal surveillance that "contraindications to fetal blood sampling include maternal infection (eg, HIV, hepatitis viruses)".[12] We were unable to find any specific recommendations from the RANZCOG regarding rupture of membranes for women with HBV or HCV.

† Without treatment, the transmission rate is 80%–95% in infants born to mothers who are positive for surface antigen and e antigen. Administering hepatitis B vaccination and immunoglobulin reduces the transmission rate to less than 5%.

‡ Many studies have failed to show a protective effect of caesarean section in reducing rates of vertical transmission.[13] One randomised controlled study demonstrated a lower transmission rate with delivery by caesarean section before membrane rupture compared with vaginal delivery or emergency caesarean section.[14] Currently there is insufficient evidence to support a change of practice and recommend routine caesarean section for HCV-infected women.

## CONCLUSION

As a follow-up to our study, educational material has been provided to all obstetricians by way of publications in their professional journal.[34] In addition, an education pamphlet has been developed and forwarded to all obstetricians along with feedback on the key questionnaire results. A second survey will be undertaken in early 2004 to assess the impact of this education process.

## COMPETING INTERESTS

None identified.

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