Impact of an education campaign on management in pregnancy of women infected with a blood-borne virus

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ABSTRACT

Objective: To assess obstetricians' antenatal screening practice for blood-borne viruses (HIV, hepatitis B and C viruses [HBV and HCV]) and knowledge about management during labour and risk of transmission via breastfeeding for infected women after an educational intervention.

Design: Cohort study, with surveys before and after an educational intervention.

Setting and participants: Survey 1 was mailed in 2002–2003 to all 767 Fellows registered with the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), and Survey 2 was mailed in 2004 to the 743 of these Fellows who were still practising.

Intervention: Multifaceted intervention with mail-out of survey results and a summary of recommended management, publication of two review articles in the RANZCOG journal, and an oral presentation at the RANZCOG annual scientific meeting.

Main outcome measures: Self-reported frequency of antenatal screening for blood-borne viruses, change in practice based on a woman's infection status, and advice given about risk of virus transmission via breastfeeding in Survey 2, compared with Survey 1.

Results: Survey 2 (response rate, 68%) found increases from the previous survey in the proportion of respondents reporting they always offered antenatal screening for HIV, from 51% to 59%, and for HCV, from 60% to 69% ($P = 0.001$ for both). For women with HIV infection, the proportion of respondents always recommending elective caesarean section increased from 37% to 49% ($P = 0.001$) and always avoiding rupture of membranes increased from 33% to 49% ($P < 0.001$). The proportion who reported advising (incorrectly) that breastfeeding is associated with increased risk of transmission to the infant decreased from 34% to 25% for HBV ($P = 0.01$) and from 47% to 39% for HCV ($P = 0.03$).

Conclusion: The frequency of antenatal testing for HIV and HCV is increasing in Australia. Knowledge about interventions to reduce mother-to-child transmission of HIV and knowledge of the risk of HBV and HCV transmission via breastfeeding improved after a relatively simple educational intervention.

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Universal screening of pregnant women for HIV and hepatitis viruses B and C (HBV and HCV) has been recommended by the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) since 2004.[1] However, our survey of obstetricians in Australia in 2002–2003 found that their self-reported practice does not reflect these recommendations, with only 51% of respondents reporting they would always offer HIV testing, and 60% HCV testing.[2]

In addition, knowledge about management strategies to reduce perinatal transmission of blood-borne viruses and about transmission risk via breastfeeding appeared poor.[2] Despite strong evidence that interventions such as elective caesarean section markedly reduce perinatal HIV transmission,[3,4] only about a third of obstetricians reported always recommending this procedure and avoiding rupture of membranes in women with HIV infection. Further, about a third of obstetricians incorrectly advised that the risk of HBV transmission is increased with breastfeeding, and 47% gave the same advice about HCV.

Following this survey, we conducted an education campaign to improve obstetricians' awareness. Here we report the results of a follow-up survey to assess the success of this campaign in:

- changing antenatal screening practice for blood-borne viruses;
- improving knowledge about interventions during labour that reduce rate of vertical transmission; and
- improving knowledge about the risk of transmission of infection via breastfeeding.

METHODS

Education campaign

Following the 2002–2003 survey,[2] we sent a two-page summary of its findings, and a comparison with published evidence and the current RANZCOG guidelines to all RANZCOG Fellows who had been mailed the original survey, irrespective of whether they had completed it. A colour brochure was also included, summarising recommended management during pregnancy for women infected with a blood-borne virus, and listing useful contacts for patients and clinicians. In addition, two review articles on HIV and HCV in pregnancy[5,6] were published in the RANZCOG journal, which is distributed to all Fellows registered with the College, and the survey findings were presented at the RANZCOG annual scientific meeting in 2003.

Follow-up survey

The follow-up survey was conducted between January and December 2004. All Fellows registered with the RANZCOG who had been mailed the original questionnaire and follow-up educational material were sent a follow-up questionnaire, comprising an abbreviated version of the original survey, and a reply-paid envelope. A reminder letter and questionnaire were mailed to non-responders after 6 weeks.

Demographic data were collected, comprising age, sex, state of registration, type of practice (public only, private only, 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.

Obstetricians were asked to respond on a 5-point Likert scale to questions about their antenatal screening practices and their clinical management of women infected with HIV, HBV or HCV. They were also asked whether they discuss breastfeeding with their patients if they are found to be infected with a blood-borne virus, and, if so, whether they advise that the risk is increased, decreased or uncertain.

Data analysis

The primary analysis compared all obstetricians who responded to the first survey

Clinical management of labour for women with HIV or hepatitis C virus (HCV) infection reported by the 363 obstetricians who responded to both surveys

	Women with HIV infection				Women with HCV infection			
Question	Survey 1	Survey 2	Difference (%)* (95% CI of difference)	*P*	Survey 1	Survey 2	Difference (%)* (95% CI of difference)	*P*
Would you alter your clinical management and . . .								
Offer elective caesarean section?								
Always	135 (37%)	178 (49%)	12% (5%–19%)	0.001	5 (1%)	14 (4%)	3% (0.2%–5%)	0.04
Usually	58 (16%)	58 (16%)	0 (–5%–5%)	1.00	5 (1%)	11 (3%)	2% (–1%–4%)	0.14
Sometimes	36 (10%)	33 (9%)	–0.8% (–5%–3%)	0.71	30 (8%)	41 (11%)	3% (–1%–7%)	0.17
Rarely	30 (8%)	25 (7%)	–1% (–5%–2%)	0.48	104 (29%)	90 (25%)	–4% (–10%–3%)	0.25
Never	54 (15%)	22 (6%)	–9% (–10%–0.1%)	0.06	203 (56%)	190 (52%)	–4% (–12%–4%)	0.33
Don't know	41 (11%)	37 (10%)	–1% (–6%–3%)	0.63	13 (4%)	12 (3%)	–0.3% (–3%–2%)	0.82
Avoid rupture of membranes?								
Always	119 (33%)	176 (49%)	16% (10%–23%)	0.001	12 (3%)	28 (8%)	4% (1%–8%)	0.009
Usually	62 (17%)	65 (18%)	0.8% (–5%–6%)	0.77	51 (14%)	70 (19%)	5% (–0.1%–11%)	0.06
Sometimes	22 (6%)	21 (6%)	–0.3% (–4%–3%)	0.86	37 (10%)	49 (14%)	3% (–1%–8%)	0.17
Rarely	25 (7%)	18 (5%)	–2% (–5%–1%)	0.25	73 (20%)	68 (19%)	–1% (–7%–4%)	0.63
Never	75 (21%)	33 (9%)	–12% (–17% to –6%)	0.001	171 (20%)	131 (36%)	16% (10%–22%)	0.001
Don't know	44 (12%)	35 (10%)	–3% (–7%–2%)	0.28	16 (4%)	11 (3%)	1% (–4%–1%)	0.32
Avoid fetal scalp electrodes?								
Always	223 (61%)	258 (71%)	10% (3%–17%)	0.01	172 (47%)	177 (49%)	1% (–6%–9%)	0.71
Usually	54 (15%)	48 (13%)	–2% (–7%–3%)	0.51	90 (25%)	105 (29%)	4% (–2%–11%)	0.21
Sometimes	8 (2%)	4 (1%)	–1% (–3%–1%)	0.25	20 (6%)	16 (4%)	–1% (–4%–2%)	0.49
Rarely	1 (0.3%)	5 (1%)	1% (–0.2%–2%)	0.11	18 (5%)	15 (4%)	–0.8% (–4%–2%)	0.60
Never	27 (7%)	9 (3%)	–5% (–8% to –2%)	0.002	48 (13%)	34 (9%)	–4% (–8% to –0.8%)	0.95
Don't know	34 (9%)	23 (6%)	–3% (–7%–1%)	0.12	10 (3%)	9 (3%)	–0.2% (–3%–2%)	0.11

* Difference = Survey 2 – Survey 1. ◆

(Survey 1) with all who responded to the follow-up survey (Survey 2) using standard frequency tests and overall proportions. A secondary analysis compared the responses of obstetricians who completed both surveys. Given the ordinal nature of the data, numbers were assigned to each outcome, and the post-education value subtracted from the pre-education value for each person who completed both surveys. A one-sample (paired) *t* test was used to test whether the difference was significantly different from zero.

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

RESULTS

The follow-up survey was mailed to 743 of the 767 RANZCOG Fellows who had been sent Survey 1. The other 24 had died, retired, or were no longer practising for other reasons. A total of 502 questionnaires were returned (response rate, 68%); 38 were excluded from analysis as they were incomplete, or the respondent no longer practised obstetrics. Of the 502 respondents to Survey 2, 363 (72%) had also responded to Survey 1.

Antenatal screening

There was an increase in the proportion of obstetricians who said they would always offer HIV screening to women as part of antenatal testing, from 51% in Survey 1 to 59% in Survey 2 ($P = 0.001$). Similarly, there was an increase in the proportion who said they would always offer HCV screening, from 60% in Survey 1 to 69% in Survey 2 ($P = 0.001$), while the proportion who said they would always offer HBV screening was constant (97% in both surveys).

Clinical management

Responses to questions about clinical management of pregnant women with HIV and HCV infection among obstetricians who responded to both surveys are summarised in the Box. For women with HIV infection, the proportion of obstetricians who would always offer elective caesarean section, avoid rupture of membranes, and avoid fetal scalp electrodes increased between Survey 1 and Survey 2 (Box). Similarly, for women with HCV infection, the proportion who would always offer elective caesarean section and avoid rupture of membranes increased (Box).

There was no significant change in reported management of women with HBV infection: the proportion who would change their practice and always recommend caesarean section was 2% in Survey 2 versus 0 in Survey 1; who would always avoid rupture of membranes was about 40% in both surveys; and who would always avoid fetal scalp monitoring was 4% in Survey 2 versus 2% in Survey 1.

Breastfeeding advice

The proportion of obstetricians who reported they would always discuss the risk of viral transmission via breastfeeding with a woman infected with a blood-borne virus was 84% for HIV, 64% for HCV, and 52% for HBV in Survey 2; corresponding figures for Survey 1 were 82% for HIV, 67% for HCV, and 55% for HBV.

Regarding advice about the effect of breastfeeding on virus transmission, 85% of obstetricians who responded would correctly advise women with HIV infection that there is an increased risk of transmission with breastfeeding.

There was a statistically significant increase between Survey 1 and Survey 2 in the number who would correctly advise that there is no increase in risk of HCV transmission via breastfeeding (20% to 27%; $P = 0.02$), and a corresponding significant decrease in the number who would advise that the risk is increased (47% to 39%; $P = 0.03$). Similarly, there was a statistically significant increase in the number who would correctly advise that there is no increase in risk of HBV transmission via breastfeeding (42% to 57%; $P = 0.001$) and a corresponding significant decrease in the number who would advise that the risk is increased (34% to 25%; $P = 0.01$).

Private versus public practice

Obstetricians were more likely to always offer HCV testing if they worked in private practice only (proportion of respondents always offering test, 74%) or in a combination of private practice and public practice (73%), than if they worked in public practice only (54%) ($P = 0.009$). This association was not found for HIV or HBV testing, with no significant difference according to type of practice.

DISCUSSION

Following a simple educational intervention, we found a significant, albeit modest, increase in the proportion of obstetricians always offering antenatal HIV and HCV testing, and a similarly modest increase in knowledge about interventions to reduce vertical transmission of HIV and about risk of HBV and HCV transmission through breastfeeding.

A limitation of our study was the use of self-reported behaviour and knowledge as surrogate markers of clinical practice. Accuracy of clinician self-reported testing behaviour as a marker of actual testing practice and change post-intervention has been reported previously, although not in an antenatal setting.[7] Our results could be strengthened by correlation of self-reported screening practice with data on antenatal testing for blood-borne viruses, and correlation of knowledge with actual clinical management. Studies are planned which will analyse de-identified data on laboratory antenatal HIV and HCV testing and national surveillance data on management of pregnancy in HIV-infected women in Australia.

A further limitation of the study was the use of mail-out questionnaires, which may have lower response rates and prevent any assessment of non-respondents. Another limitation was the inclusion of only registered obstetricians, as general practitioners and midwives may also be responsible for antenatal testing. Inclusion of these groups in future surveys may provide a more complete picture of antenatal screening practice in Australia.

Continuing education for health professionals is challenging, and reported efficacy varies between approaches and participants. Education and feedback on compliance with clinical guidelines has been reported as effective in modifying clinicians' testing patterns,[8] as has direct mail in increasing clinician knowledge.[9] In contrast, formal continuing medical education and distribution of educational materials did not effectively change behaviour.[10] When audit and feedback are effective, the change seems greater when baseline adherence to recommended practice is low.[11] In our study, it is likely that the moderate effect seen after the education campaign relates to the initial low compliance with the RANZCOG guidelines for antenatal testing.

The purpose of antenatal screening for infectious diseases is to detect those which have the potential to affect the mother or fetus adversely, and for which there is an effective intervention. It is therefore of concern that a greater proportion of obstetricians always offer HCV compared with HIV screening, as there is minimal evidence to date that interventions reduce HCV transmission from mother to baby. In contrast, for HIV, there is extensive evidence that the transmission risk can be significantly reduced by interventions such as antiretroviral therapy for mother and neonate, delivery by caesarean section, and avoidance of breastfeeding,[3,12-14]

Our study was not designed to determine reasons for differences in antenatal screening rates. A possible factor contributing to the greater proportion of obstetricians always screening for HCV compared with HIV may be their greater familiarity with hepatitis screening, as 97% reported always including HBV testing in antenatal testing. In addition, the emphasis on counselling before HIV testing may be a barrier to offering this test in the antenatal setting. Other possible reasons that obstetricians do not perform universal HIV testing include lack of awareness of the RANZCOG recommendation, confusion given the contrary policy of government (which recommends offering HIV and HCV testing only to women identified with risk factors for exposure[15,16]), concerns over the cost of testing, or disagreement with the recommendation. To improve compliance with the RANZCOG recommendations, it is important to assess these potential barriers to universal screening.

If the reason for antenatal HCV screening is opportunistic — to detect women with asymptomatic chronic illness and a risk of long-term complications, which is modifiable by early treatment — then it is essential to audit how women with HCV infection are referred and managed postpartum, and the kind of information and medical support provided to them.

It is also of concern that our survey found an increase in the proportion of obstetricians who would change their clinical practice and always offer elective caesarean section to women with HCV infection. Reduced transmission of HCV with elective caesarean section has been reported in one small, observational study, whose authors warned of the need for a larger randomised trial before a change in clinical practice.[17] Their findings contrast with a number of published observational studies that found no evidence of reduced transmission of HCV with elective caesarean section.[18,19]

Although antenatal HIV testing is not universal, our results suggest that it is offered more often since our education campaign. It would therefore be timely to evaluate the uptake and acceptability of HIV testing to women, adequacy of pre- and post-test counselling in the antenatal setting, and adequacy of resources to cope with the additional workload. With relatively small numbers of HIV-infected pregnant women in Australia, it is also important to develop mechanisms for appropriate referral and follow-up of those diagnosed with HIV infection during antenatal screening, along with guidelines for their clinical management.

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COMPETING INTERESTS

None identified.

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