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Maternal cytomegalovirus infection prevention: The role of Dutch primary care midwives

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ABSTRACT

Objective: to assess the knowledge of cytomegalovirus (CMV) infection among Dutch primary care midwives, and clinical approaches to informing women about CMV.

Design: cross-sectional study, using self-administered questionnaires.

Participants: 330 Dutch primary care midwives.

Setting: primary midwifery care practices across the Netherlands.

Main outcome: Midwives' knowledge of CMV transmission routes and maternal symptoms, and clinical practice behaviours regarding CMV, the information typically provided or reasons for not informing pregnant women about CMV.

Findings: the overall median knowledge score was 8.0 out of a maximum possible score of 13.0. Of all participants, 10.6% reported always informing pregnant women about CMV infection prevention and 41.0% reported never informing pregnant women. The main reason indicated for not informing pregnant women was lack of knowledge about preventive methods (45.7%).

Conclusion: Dutch primary care midwives have limited knowledge of CMV infection. Improvement in providing education to pregnant women about strategies to prevent CMV is necessary.

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Background

Cytomegalovirus (CMV) infection is one of the most common viral infections during pregnancy, and congenital CMV infection is a common cause of birth defects and developmental disabilities, such as hearing impairment and developmental delay (Kenneson and Cannon, 2007; de Vries et al., 2011; Cannon et al., 2012). The estimated birth prevalence of congenital CMV is 0.64% worldwide (Kenneson and Cannon, 2007). In the Netherlands, the estimated birth prevalence of CMV is 0.54%, which translates to approximately 1000 infants infected with congenital CMV infection annually (de Vries et al., 2011); this equals the prevalence rate of Down syndrome (Cannon and Davis, 2005; van Gameren-Oosterom et al., 2012).

Approximately 10–15% of the live-born infants with congenital CMV infection have signs and symptoms at birth, and an additional 15–20% of the infected newborns develop symptoms later in life (Kenneson and Cannon, 2007; de Vries et al., 2011). Thus CMV infection in pregnant women is an important, albeit perhaps an under-recognised public health problem.

Currently, there are no vaccines or treatment options available to prevent CMV infection; therefore it is important to provide pregnant women with information on CMV infection prevention methods. And although it is difficult to investigate the exact impact of hygienic interventions (such as frequent hand washing after contact with saliva or urine of infants and young children) on reducing the risk of maternal CMV infection, studies consistently show that education on hygienic behaviour can significantly reduce the risk of acquiring maternal CMV infection, and that pregnant women are often highly motivated to change their behaviour for the safety of their unborn baby (Finney et al., 1993; Adler et al., 1996, 2004;

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Harvey and Dennis, 2008; Picone et al., 2009; Vauloup-Fellous et al., 2009). However, many health care providers involved in mother and childcare do not counsel their patients about CMV infection prevention (Centers for Disease Control and Prevention (CDC), 2008), and written educational materials on CMV infection prevention for pregnant women in the Netherlands are scarce. As a consequence, most pregnant women have not heard about the risk of CMV infections and they do not know how to prevent the infection (Jeon et al., 2006; Ross et al., 2008; Cannon et al., 2012; Cordier et al., 2012; Pereboom et al., 2013).

Midwives are important in providing preventive counselling, as most pregnant women start their antenatal care in primary midwifery care in the Netherlands (Wieggers, 2007). To our knowledge there is only one Dutch study among doctors involved in mother and childcare that assessed knowledge of CMV infection in pregnancy, but this study did not include midwives (Korver et al., 2009). In addition, no studies have explored why some health care providers do not inform pregnant women about methods to prevent CMV infection. Therefore, we aimed to assess the knowledge of Dutch primary care midwives about CMV transmission and maternal symptoms and the information they provide to pregnant women about CMV infection prevention. A secondary aim was to assess the reasons for not providing information on CMV infection prevention to pregnant women among primary care midwives in the Netherlands who indicate that they do not provide such information. The findings provide an important starting point for the development of new health policies or educational programs for midwives in order to reduce the burden of congenital CMV infection.

Methods

This is a national cross-sectional study regarding Dutch primary care midwives' knowledge about CMV transmission and maternal symptoms; clinical practice regarding the provision of CMV infection prevention information to clients and any reasons for not informing pregnant women about CMV.

Participants

We obtained addresses of all 519 primary midwifery care practices in the Netherlands through the Royal Dutch Organization of Midwives (KNOV). Of all primary care midwives ($n=1910$) practicing in the Netherlands, 97.1% are associated with the KNOV (Hingstman and Kenens, 2011).

Between September and November 2011, we asked each of the 519 practices to select a midwife at their practice to participate in the study. We sent a questionnaire regarding preventable infectious diseases, including CMV infection, to all practices, accompanied by a cover letter with information about the study and a postage paid return envelope. Because the questionnaire contained questions about midwifery care practice policies, only one midwife per practice was invited to complete the questionnaire. Four weeks after the initial invitation, we sent a reminder to all non-responding practices. We excluded questionnaires with missing answers to all questions about CMV.

Data collection

We developed a self-administered questionnaire based on previous studies and the literature (Korver et al., 2009; Kirkham and Berkowitz, 2010). The questionnaire included topics on demographic and professional characteristics, knowledge on CMV transmission and maternal symptoms, sources of knowledge information, information provision and reasons for not informing

pregnant women about CMV if applicable. Demographic and professional characteristics of the midwives included gender, age, ethnic origin, school graduation, years of work experience, type of practice (solo practice, duo practice or group practice), and whether the practice location was rural, urban or highly urban. Thirteen questions covered midwives' knowledge about CMV transmission and maternal symptoms of infection in pregnant women. We asked midwives to indicate which transmission routes and maternal symptoms were 'true', 'false' or whether they 'did not know'. We presented midwives with a list of seven transmission routes for CMV infections of which two were false and with six maternal symptoms of CMV infection of which three were false. We collected data on information pertaining to CMV that they provided to clients by asking midwives how often they inform pregnant women about CMV infection prevention ('always', 'usually', 'sometimes', or 'never'). If midwives indicated that they 'always', 'usually' or 'sometimes' give information, they could choose from a list which prevention methods they provided and whether the information was verbal or written. In addition, if midwives indicated that they did 'usually', 'sometimes' or 'never' give information on CMV infection prevention, they could state their reasons for not providing information by a semi-structured question. Three answering possibilities were given: not enough time; not sure about preventive strategies; and CMV is a rare disease. There was an open space where midwives could report other reasons and they could give multiple answers.

Data analysis

We calculated frequency distributions for questionnaire items on sources of information, knowledge, informing practices and reasons for not informing pregnant women about CMV infection prevention. Sum scores were calculated for the knowledge scores. Each correctly identified transmission route or maternal symptom contributed to the knowledge score (one point for each correct answer). The knowledge score could therefore vary between zero and seven for CMV transmission routes; and between zero and six for maternal symptoms of CMV. For analyses, we dichotomised the midwives' number of years of work experience according to the median value. We categorised the midwives' age into ≤ 24 years, 25–39 years, 40–54 years or ≥ 55 years; and practice location into rural (< 1000 addresses per squared kilometre), urban (1000–2499 addresses per squared kilometre) or highly urban (≥ 2500 addresses per squared kilometre). Ethnic origin was defined according to the classification of Statistics Netherlands, and categorised into Dutch origin, other western origin or non-western origin.

We used non-parametric tests, Mann–Whitney U test and Kruskal–Wallis test, to test for differences in median knowledge scores between subgroups of midwives based on their demographic and professional characteristics, because knowledge scores were not normally distributed. We considered p -values < 0.05 as statistically significant and used the statistical software package SPSS 20.0 (SPSS Inc., Chicago, IL) for all analyses.

Findings

In total 345 midwives from 519 midwifery practices returned the questionnaire. Data from 15 midwives were excluded: six midwives did not practice midwifery anymore, one was a student at the time of enrolment and eight midwives did not complete the questions about CMV. We included the data of the remaining 330 midwives in the analyses, representing a net response rate of 63.6%.

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