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Knowledge and Practices of Obstetricians and Gynecologists Regarding Cytomegalovirus Infection During Pregnancy --- United States, 2007

In the United States, congenital cytomegalovirus (CMV) infection occurs in approximately 1 in 150 live births (1), leading to permanent disabilities (e.g., hearing loss, vision loss, and cognitive impairment) in approximately 1 in 750 live-born children (2). A common mode of CMV transmission to a pregnant woman is through close contact with infected bodily fluids such as urine or saliva, especially from young children (3). Because no vaccine is available and treatment options are limited, renewed attention has been given to prevention of CMV infections among pregnant women through traditional infection-control practices, such as good hand hygiene (3). These practices have been encouraged by organizations such as CDC and the American College of Obstetricians and Gynecologists (ACOG) (4), which recommend that obstetricians and gynecologists (OB/GYNs) counsel women on careful handling of potentially CMV-infected articles, such as diapers, and thorough hand washing after close contact with young children ([Box](#)). Despite this increased emphasis on avoiding infection during pregnancy, few women are aware of CMV infection and how it can be prevented (5). During March--May 2007, ACOG surveyed a national sample of OB/GYNs to assess their knowledge and practices regarding CMV infection prevention. This report describes the results of that survey, which indicated that fewer than half (44%) of OB/GYNs surveyed reported counseling their patients about preventing CMV infection. These results emphasize the need for additional training of OB/GYNs regarding CMV infection prevention and for a better understanding of the reasons that physician knowledge regarding CMV transmission might not result in patient counseling.

In March 2007, ACOG mailed surveys to members of the ACOG Collaborative Ambulatory Research Network (CARN), a group of practicing OB/GYNs who were identified via a stratified sampling scheme as representative of ACOG relative to geographic location, age, and sex and who are invited to participate in periodic ACOG surveys.* Two additional mailings (in April and May) were sent to physicians in this group who did not respond. Respondents were excluded if they indicated that they did not treat obstetric patients (n = 85) or practiced outside the United States (n = 6). Physicians were asked about their knowledge and practices related to prevention of several infections, including CMV, during pregnancy.

Of the 606 eligible CARN members, surveys were received from 305 (response rate: 50%). The respondents were statistically different ($p < 0.05$) from the overall group of ACOG members relative to mean

age and geographic district ([Table 1](#)). Although 90% of OB/GYNs reported knowing that washing hands reduces the risk for CMV infection during pregnancy, a smaller proportion were aware that not sharing utensils (57%) and avoiding children's saliva (55%) reduces infection risk ([Table 2](#)).[†] Sixty percent of OB/GYNs reported that they routinely recommended hand washing to pregnant women; approximately one third reported routinely recommending that pregnant women not share utensils and avoid child saliva (31% and 30%, respectively). Fewer than half (44%) of OB/GYNs reported having counseled their patients about prevention of CMV infection.[§]

Approximately one fourth (27%) of OB/GYNs reported having diagnosed CMV infection in a pregnant woman since 2003 ([Table 2](#)). Among the 86% of OB/GYNs who reported ever testing for CMV during pregnancy, most provided CMV testing only if their patients requested a test or because a fetal anomaly was identified, consistent with ACOG recommendations (4) and CDC recommendations that CMV testing during pregnancy be performed under certain circumstances, which include the development of a mononucleosis-like illness during pregnancy.[¶]

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Editorial Note:

Congenital CMV infection is a major source of childhood disability, including hearing loss, vision loss, and cognitive impairment (2). The estimated 5,000--8,000 children per year who develop disabilities associated with CMV infection is similar to or higher than the number estimated to be affected by better-known conditions, including Down syndrome and neural tube defects (2,3). Women who experience their first (i.e., primary) infection during pregnancy are at highest risk for transmitting CMV to their fetuses, with approximately 33% of fetuses becoming infected. However, women who have experienced an infection before pregnancy and then have a recurrent infection (i.e., a viral reactivation or reinfection with a different strain) during pregnancy also can transmit CMV to their fetuses, with approximately 1% of fetuses becoming infected (1). Most infections among pregnant women are believed to occur through contact with the urine or saliva of infected children or through sexual activity (6).

Numerous potential interventions exist for preventing congenital CMV infections or disease. Several vaccines are being developed, although progress has been slow (3). The effectiveness of certain interventions is controversial, including antiviral treatment or passive immunization using hyperimmune globulin for pregnant women with primary CMV infection (7) and antiviral treatment for newborns with congenital infection (8). Other types of interventions, such as newborn screening and follow-up to identify developmental disabilities and improve language or educational development, target secondary outcomes.

Good hand hygiene is a simple intervention that has the potential to decrease risk for CMV infection during pregnancy (3,4). CMV frequently is found in the urine and saliva of preschool-age children (typically 5%--25% of young children, although the percentage can be higher in day care centers) (3) and has been found on the hands of child-care providers. Furthermore, hand washing has been shown to prevent infection with various pathogens. Thus, although no definitive studies have documented that particular interventions reduce transmission, evidence suggests that avoiding exposure to urine and saliva, especially through good hand hygiene, reduces risk for CMV infection during pregnancy (3). Although such behavioral changes can

be difficult to initiate and maintain, evidence indicates that pregnant women will make certain behavior changes that will protect their fetuses (3). Such measures are simple and likely to be cost effective; good hand hygiene is inexpensive, and the cost savings from preventing even one case of congenital CMV disease is high (9).

CMV can be transmitted through sexual contact, which is important for women to know. Because of the numerous programs and resources already in place to promote healthy and safe sexual practices for infections other than CMV (e.g., existing HIV/AIDS programs), this survey of OB/GYNs focused on prevention messages that might not be as widely promoted during pregnancy, such as good hand hygiene.

Whether OB/GYNs should routinely test pregnant women for CMV is a complicated matter. An initial negative maternal immunoglobulin G (IgG) test, which indicates that the woman has never been infected with CMV, might indicate a higher risk for fetal infection if the mother subsequently becomes infected during pregnancy and thus might be a useful motivational tool to encourage the mother to practice good hygiene. A positive maternal IgG test might indicate lower risk for fetal infection; nevertheless, good hand hygiene still should be advised to prevent possible maternal CMV reinfection. Additional CMV assays (e.g., immunoglobulin M) are difficult to interpret, often not commercially available in the United States (e.g., IgG avidity), or invasive (e.g., polymerase chain reaction testing of amniotic fluid). Furthermore, testing algorithms that use these assays are only moderately effective at predicting maternal infection, fetal infection, and fetal damage (10). For these reasons, and because no proven treatment exists, routine CMV testing during pregnancy is not recommended; testing is recommended only when a fetal anomaly is detected, a pregnant woman experiences a mononucleosis-like illness, or a pregnant woman requests the test.**

The findings in this report are subject to at least two limitations. First, data were self-reported by OB/GYNs and might have been subject to social-desirability bias, which might have resulted in overreporting and an overestimation of knowledge and practices relating to CMV infection. Second, only ACOG CARN members were surveyed, and the response rate among CARN members was only 50%. Both the OB/GYNs who agree to be in CARN and those who choose to respond to the survey might be more interested in prevention counseling and as a result more likely to provide such counseling; therefore, the results might not be representative of all practicing OB/GYNs and might have resulted in an overestimation of the prevalence of counseling for CMV infection prevention.

Based on the survey, fewer than half of OB/GYNs reported counseling their patients regarding CMV-infection prevention. In addition, responses indicated that many OB/GYNs did not have a comprehensive understanding of modes of CMV transmission and possible prevention measures. These results emphasize the need for additional training of OB/GYNs regarding CMV infection prevention and better understanding of the reasons that physician knowledge about CMV transmission does not necessarily result in patient counseling. Additional surveys of OB/GYNs should attempt to identify factors associated with providing CMV counseling, solicit more detailed information about CMV knowledge and counseling practices, and assess perceptions related to frequency of infection, role of testing, and efficacy of good hand hygiene and prevention counseling.

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* CARN was established in 1990; initially, all ACOG members were invited to participate. Since then, periodic additional invitations to join CARN have been made to a subset of ACOG members who have been chosen via a stratified, random sampling scheme. Certain subgroups are oversampled so that CARN members are representative of ACOG members relative to geographic location, age, and sex.

† Based on responses to the following questions: "Which of the following actions would reduce the risk of infections during pregnancy that could adversely affect the embryo or fetus: hand washing after diaper changing, not sharing utensils with toddlers, not getting children's saliva in eyes or mouth?"

§ Based on responses to the following questions: "I have diagnosed one or more of the following infections in pregnant women in since 2003: congenital cytomegalovirus (CMV)" "Do you counsel your patients about why and how to prevent congenital cytomegalovirus (CMV)?" "Do you routinely recommend the following precautions about: hand washing after diaper changing, not sharing utensils with toddlers, or not getting children's saliva in eyes or mouth? (Verbally, in print, neither, or both)" "Which of the following best describes your practice regarding testing for...congenital cytomegalovirus (CMV): test all patients, test no patients, test after report of significant exposure by patient, test in response to patient request, test if fetal anomaly identified, test if negative history for previous illness?"

¶ Additional information available at <http://www.cdc.gov/cmvmv>.

** Additional information available at <http://www.cdc.gov/cmvmv/clinicians.htm>.

Table 1

TABLE 1. Comparison of American College of Obstetricians and Gynecologists (ACOG) members and ACOG Collaborative Ambulatory Research Network (CARN)* survey respondents, by selected demographic characteristics — United States, 2007

Characteristic	ACOG members (N = 32,441)	CARN survey respondents (N = 305)	p value†
Mean age (yrs)	48.5	46.9	<0.01
Sex (%)			0.11
Female	45.1	49.3	
Male	54.9	50.7	
Geographic district§ (%)			0.03
I	6.6	7.5	
II	7.9	5.2	
III	7.9	6.2	
IV	19.5	17.7	
V	10.1	5.2	
VI	9.0	9.5	
VII	17.7	23.9	
VIII	11.0	13.8	
IX	10.4	10.8	

* ACOG CARN members are a group of practicing obstetrician-gynecologists selected to be representative of ACOG with respect to geographic location, age, and sex who voluntarily participate in periodic ACOG surveys.

† Student's t test for means; chi-square test for categorical data.

§ *District I:* Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, and Québec; *district II:* New York, Bermuda; *district III:* Delaware, New Jersey, and Pennsylvania; *district IV:* District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Puerto Rico, and West Indies; *district V:* Indiana, Kentucky, Ohio, Michigan, and Ontario; *district VI:* Illinois, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Wisconsin, Manitoba, and Saskatchewan; *district VII:* Alabama, Arkansas, Kansas, Louisiana, Mexico, Mississippi, Missouri, Oklahoma, Tennessee, and Texas; *district VIII:* Alaska, Alberta, Arizona, British Columbia, Central America, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, American Samoa, Guam, Northwest Territory, and Yukon Territory; *district IX:* California.

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Table 2

TABLE 2. Number and percentage of American College of Obstetricians and Gynecologists (ACOG) obstetrician-gynecologists who reported knowledge

and practices related to congenital cytomegalovirus (CMV) prevention, by responses to selected questions from the ACOG Collaborative Ambulatory Research Network (CARN)* survey — United States, 2007

Characteristic	No.	(%)	(95% CI [§])
Knowledge of actions that can reduce risk for CMV infection during pregnancy[†]			
Washing hands after diaper changing (n = 302)			
Yes	273	(90.4)	(86.7–93.3)
No	22	(7.3)	(4.8–10.6)
Don't know	7	(2.3)	(1.0–4.5)
Not sharing utensils with toddlers (n = 296)			
Yes	170	(57.4)	(51.8–63.0)
No	85	(28.7)	(23.8–34.1)
Don't know	41	(13.9)	10.3–18.1)
Not getting children's saliva in eyes or mouth (n = 297)			
Yes	164	(55.2)	(49.5–60.8)
No	85	(28.6)	(23.7–34.0)
Don't know	48	(16.2)	(12.3–20.7)
Practices related to CMV diagnosis and prevention[¶]			
Diagnosed CMV in pregnant women since 2003 (n = 298)			
Yes	80	(26.8)	(22.1–32.1)
No	214	(71.8)	(67.0–77.0)
Don't know	4	(1.3)	(0.5–3.2)
Counsel patients about CMV prevention (n = 294)			
Yes	130	(44.2)	(38.6–49.9)
No	156	(53.1)	(47.4–58.7)
Don't know	8	(2.7)	(1.3–5.1)
Routinely recommend washing hands (n = 299)			
Yes	179	(59.9)	(54.2–65.3)
No	120	(40.1)	(34.7–45.8)
Routinely recommend not sharing utensils (n = 296)			
Yes	92	(31.1)	(26.0–36.5)
No	204	(68.9)	(63.5–74.0)
Routinely recommend avoiding child saliva (n = 297)			
Yes	88	(29.6)	(24.7–35.0)
No	209	(70.4)	(65.0–75.4)
CMV testing (N = 305)			
On all patients	3	(1.0)	(0.3–2.6)
On no patients	44	(14.4)	(10.8–18.7)
After report of an exposure	184	(60.3)	(54.8–65.7)
In response to a patient request	97	(31.8)	(26.8–37.2)
When a fetal anomaly is identified	133	(43.6)	(38.1–49.2)
When patient has a negative history for illness	5	(1.6)	(0.6–3.6)

* ACOG CARN members are a group of practicing obstetrician-gynecologists selected to be representative of ACOG with respect to geographic location, age, and sex who voluntarily participate in periodic ACOG surveys.

[†] Based on responses to the following questions: "Which of the following actions would reduce the risk of infections during pregnancy that could adversely affect the embryo or fetus: hand washing after diaper changing, not sharing utensils with toddlers, not getting children's saliva in eyes or mouth?"

[§] Confidence interval.

[¶] Based on responses to the following questions: "I have diagnosed one or more of the following infections in pregnant women in since 2003: congenital cytomegalovirus (CMV)." "Do you counsel your patients about why and how to prevent congenital cytomegalovirus (CMV)?" "Do you routinely recommend the following precautions about: hand washing after diaper changing, not sharing utensils with toddlers, not getting children's saliva in eyes or mouth? (Verbally, in print, neither, or both)" "Which of the following best

describes your practice regarding testing for...congenital cytomegalovirus (CMV): test all patients, test no patients, test after report of significant exposure by patient, test in response to patient request, test if fetal anomaly identified, test if negative history for previous illness?"

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Box

BOX. CDC and American College of Obstetricians (ACOG) recommendations for reducing risk for cytomegalovirus (CMV) infection

CDC recommendations for women who are pregnant or might become pregnant*

- Wash hands often with soap and water, especially after contact with saliva of or diapers from young children. Wash well for 15–20 seconds.
- Do not kiss children aged <6 years on the mouth or cheek. Instead, kiss them on the head or give them a hug.
- Do not share food, drinks, or utensils (spoons or forks) with young children.

ACOG recommendations for obstetricians and gynecologists on counseling pregnant women†

- Advise careful handling of potentially infected articles, such as diapers.
- Advise thorough handwashing when around young children or immunocompromised persons.
- Explain that careful attention to hygiene is effective in helping prevent CMV transmission.

* Available at <http://www.cdc.gov/cmV>.

† American College of Obstetricians and Gynecologists. Perinatal viral and parasitic infections. ACOG Practice Bulletin 20. 20th ed. Washington, DC: American College of Obstetricians and Gynecologists; 2000.

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