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Practices of obstetrician-gynecologists regarding nonvaccine-related public health recommendations during the 2009 H1N1 influenza pandemic

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Abstract

OBJECTIVE—We examined practices of obstetrician-gynecologists regarding nonvaccine-related public health recommendations during the 2009 H1N1 influenza pandemic.

STUDY DESIGN—From February to May 2010, a survey was sent to a random sample of members of the American College of Obstetricians and Gynecologists involved in obstetric care.

RESULTS—Obstetrician-gynecologists varied in their adherence to 2009 H1N1 influenza public health recommendations. Nearly all reported prescribing antiviral medications to pregnant women with suspected influenza. Most obstetrician-gynecologists reported using preventive practices in the outpatient setting to reduce exposure of well patients to ill ones. A wide range of responses was provided regarding postpartum infection control practices, suggesting lack of awareness of, disagreement with, or difficulty adhering to these recommendations.

CONCLUSION—Obstetrician-gynecologists reported that they adhered to some recommendations related to 2009 H1N1 influenza, but not to others. These data provide insight into strategies for development and dissemination of recommendations in a future pandemic.

Keywords

infection control; influenza; nonpharmaceutical interventions; pandemic; pregnancy; treatment; 2009 H1N1

Pregnant women have been shown to be at increased risk for influenza-associated complications during influenza seasons and previous influenza pandemics.[1] During the influenza A(H1N1)pdm09 (2009 H1N1) pandemic, pregnant women were 4 times more likely to be hospitalized than persons in the general population,[2] and accounted for a

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disproportionate number of deaths.[3] Treatment within the first 2 days after symptom onset was associated with a lower risk of admission to an intensive care unit and death.[3]

Vaccination is the best way to prevent influenza and its complications among pregnant women[4] and infants less than 6 months of age,[5–8] and results regarding attitudes and practices of obstetrician-gynecologists regarding influenza vaccination during the 2009 H1N1 pandemic were published recently.[9] However, 2009 H1N1 vaccine did not become available until several months after the first cases of 2009 H1N1 were recognized in the United States. Before that time, non-pharmaceutical interventions, infection control guidelines, and antiviral treatment and chemoprophylaxis were the primary strategies to prevent influenza-associated complications.

During the 2009 H1N1 pandemic, public health recommendations specific to pregnant women regarding nonpharmaceutical interventions, infection control in the inpatient and outpatient settings, influenza diagnostic testing, antiviral treatment and prophylaxis, as well as those related to influenza vaccine against seasonal and 2009 H1N1 influenza were developed by the Centers for Disease Control and Prevention (CDC).[10] Guidelines on nonpharmaceutical interventions for prevention of influenza included recommendations for frequent hand hygiene and respiratory etiquette, and avoidance of ill people.[11] Within health care outpatient settings, clinicians were advised to identify and isolate ill patients to prevent exposure to well patients and to provide facemasks for ill patients.[12] In the hospital during labor and delivery and postpartum, clinicians were advised to limit visitors (ie, allow the presence only of healthy adults who are necessary for the woman's emotional well-being and care in labor and delivery), have ill mothers wear facemasks during labor and delivery, temporarily separate ill mothers from their healthy newborns, and have the mother express breast milk for infant feeding by a healthy caregiver.[13] CDC recommended empiric treatment with oseltamivir of pregnant women who presented with suspected or confirmed influenza, and emphasized that treatment decisions should be based on suspicion of influenza, rather than on diagnostic testing, given the low sensitivity of rapid influenza diagnostic tests and the time necessary for more definitive testing to be completed. CDC guidelines during the pandemic also stated that chemoprophylaxis could be considered for pregnant women who had close contact with a person with suspected or confirmed influenza.[14]

These public health recommendations specific to pregnant women were vigorously communicated to health care providers, including obstetrician-gynecologists, through close collaborative efforts with key partners such as the American College of Obstetricians and Gynecologists (ACOG) and a wide variety of mechanisms (eg, internet, webinars, emails, publications).[10] The practices of obstetrician-gynecologists in the United States regarding nonvaccine-related public health recommendations during the pandemic have not yet been examined. In this study, we present results of a survey of ACOG members who provided obstetric care regarding their practices related to public health recommendations during the 2009 H1N1 pandemic (excluding those related to vaccines).

Materials and Methods

To determine practices of obstetrician-gynecologists regarding strategies to prevent influenza used in outpatient and inpatient settings, influenza diagnostic testing, and antiviral treatment and prophylaxis, we mailed a survey to a nationally representative sample of 3116 obstetrician-gynecologists selected randomly from a sample of 33,685 practicing obstetrician-gynecologists who were Fellows or Junior Fellows of ACOG. Obstetrician-gynecologists currently involved in obstetric care were eligible to participate; others were asked to return the survey without responding. Obstetrician-gynecologists received the survey, a cover letter, and a prepaid envelope; participants were not offered an incentive to participate. The first mailing was sent in February 2010, with second, third, and fourth mailings sent to nonrespondents at 4- to 5-week intervals. The survey consisted of 33 questions about basic demographics of respondents and their patients, and practices regarding public health recommendations for pregnant women regarding influenza. Five weeks after the fourth mailing, a short follow-up survey with 6 questions was sent to nonrespondents to assess nonresponse bias by comparing the responses of respondents and nonrespondents.

Analyses were performed using SAS version 9.1 (SAS Institute Inc., Cary, NC) and SPSS version 16.0 (SPSS Inc., Chicago, IL). We calculated frequencies of responses to each survey question, excluding nonresponses from the denominators for each question. To compare differences in responses for the 2008–2009 and 2009–2010 influenza seasons, 2-sided χ^2 tests and a significance level of $P \leq .05$ were used.

This project was reviewed for human subject concerns by CDC and ACOG and was deemed to be exempt from institutional review board review.

Results

Of the 3116 surveys mailed, 20 were returned as undeliverable. Among the obstetrician-gynecologists who received the survey, 2 refused to participate and 1310 returned the survey, for a response rate of 42.3% (1310/3096). Of those providers who returned the surveys, 437 (33.4%) responded that they did not provide obstetric care during the 2009–2010 influenza season; thus, responses from 873 eligible participants are included in this analysis.

The mean age of respondents was 48.9 years, mean duration of clinical practice was 16.7 years, and 51.1% of respondents were female (Table 1). Nearly half of the respondents practiced in a group obstetrician-gynecologist setting, and nearly all respondents considered primary care/preventive medicine as either a very important or important part of their practice. Respondents were asked to estimate the proportion of their patients eligible for Medicaid and the mean was 33.4%. Respondents were also asked about the race-ethnicity of patients in their practices; responses showed that over half of patients were non-Hispanic white (Table 1).

Respondents reported using several preventive practices in outpatient obstetric settings more often during the 2009–2010 season than during the 2008–2009 influenza season. More than half of providers reported rescheduling routine appointments for pregnant patients with

influenza-like illness (ILI) until they were healthy, questioning patients about recent ILI symptoms so that those with suspected ILI could be separated from healthy women, and asking patients with ILI to wear facemasks in the waiting area during the 2009–2010 season (Table 2). Obstetrician-gynecologists also reported discussing preventive measures with pregnant patients more often during the 2009–2010 season than during the 2008–2009 season, including social distancing (eg, minimizing contact with sick individuals), frequent handwashing, cough etiquette, early symptom recognition, and prompt treatment of fever with fever-reducing medications (Table 2).

With regard to infection control during labor and delivery (Table 3), nearly 80% of obstetrician-gynecologists reported that they questioned patients about the presence of flu-like symptoms “most of the time,” and nearly all reported separating ill from healthy patients during labor and delivery. However, fewer respondents reported asking ill patients to wear a surgical mask during labor and delivery or required ill mothers to wear a mask before holding their healthy newborns immediately after delivery “most of the time.” More than 80% of responding obstetrician-gynecologists reported limiting visitors to healthy persons who were necessary for the patient’s emotional well-being (Table 3).

When asked about postpartum infection control guidelines (Table 3), about 40% of obstetrician-gynecologists reported rarely or never separating ill mothers from their healthy newborns immediately after delivery. More than half of obstetrician-gynecologists reported allowing rooming-in between a convalescent mother and her healthy newborn after delivery under droplet precautions either most of the time or sometimes. “Most of the time” was selected by more than 10% of obstetrician-gynecologists in response to several different postpartum options, including allowing rooming-in between a convalescent mother and her healthy newborn after delivery with no precautions, separating a healthy newborn from an ill mother and moving the infant to the well infant nursery in proximity to other newborns, and separating a healthy newborn from an ill mother and moving the infant to the well infant nursery but apart from other newborns.

The majority of obstetrician-gynecologists reported that they encouraged ill mothers to wear a facemask while directly breastfeeding their healthy newborns either most of the time or sometimes (Table 3). Obstetrician-gynecologists also frequently reported encouraging mothers to wash their hands with soap and water before breastfeeding and to observe respiratory etiquette guidelines. Obstetrician-gynecologists less commonly reported that they encouraged ill mothers to express breast milk to enable a well person to feed their infant either most of the time or sometimes. When asked about influenza diagnostic testing practices (Table 4), more than half of obstetrician-gynecologists reported relying on clinical diagnosis, although about a third reported using rapid influenza diagnostic testing for a pregnant woman presenting with symptoms of influenza. More than half said that they were less likely to or would not prescribe antiviral medications to a patient with negative rapid test results (Table 4). Rapid tests were used more commonly for pregnant women with underlying conditions than for healthy pregnant women. Nearly all obstetrician-gynecologists reported that they prescribed antiviral treatment to pregnant women based on clinical evaluation; however, 8.7% reported that they would treat low-risk pregnant women only after test results confirmed influenza (Table 5). Obstetrician-gynecologists were

significantly less likely to base their treatment decisions on test results in high-risk women (women with underlying conditions in addition to pregnancy). Most obstetrician-gynecologists reported having no or only slight concerns about the safety of antiviral medications for the pregnant woman or her fetus. Most obstetrician-gynecologists did not recommend chemoprophylaxis for high- or low-risk women with a possible exposure at a public event. The majority of obstetrician-gynecologists reported offering antiviral prophylaxis to a patient with a household member ill with confirmed or suspected 2009 H1N1 influenza, to a patient who provides care to patients and has an exposure, and to a teacher with an exposure in the elementary school or day care setting. Obstetrician-gynecologists reported being significantly more likely to offer antiviral chemoprophylaxis to a high-risk patient than a low-risk patient.

A total of 202 nonrespondents returned the short follow-up survey. Although these obstetrician-gynecologists were similar with regard to the number of years in clinical practice and the percentage of their pregnant patients that were eligible for Medicaid, some differences were observed between respondents who completed the full survey and those that only completed the short follow-up survey. Specifically, those completing the short follow-up survey were less likely to question arriving patients about recent symptoms of influenza and to separate women with suspected influenza from those that were healthy ($P = .001$). Those completing only the short follow-up survey were also less likely to ask patients with influenza-like illness to wear facemasks in the waiting area ($P = .001$) and were more likely to report concern about the safety of antiviral medications ($P < .001$).

Comment

This study examines practices of US obstetrician-gynecologists related to public health recommendations during the first influenza pandemic of the 21st century. Obstetrician-gynecologists frequently reported that their practices had changed from the 2008–2009 influenza season to the 2009–2010 season, suggesting an uptake of public health recommendations during the pandemic. In some cases, nearly all obstetrician-gynecologists reported practices consistent with CDC guidelines; for example, more than 90% of obstetrician-gynecologists reported that they prescribed antiviral medications for pregnant women with symptoms of influenza. However, practices related to other public health recommendations were more disparate. Although most obstetrician-gynecologists reported preventive practices in the outpatient setting consistent with those recommended by CDC (ie, questioning patients arriving to the clinic about recent ILI symptoms and separating those with suspected ILI from those that are healthy, and asking patients with ILI to wear facemasks in the waiting area), a notable proportion did not report these practices, and pregnant women in these facilities might have been at risk of exposure to influenza in the healthcare setting. A wide range of responses was provided to questions regarding infection control in the postpartum setting, with most obstetrician-gynecologists not reporting practices consistent with those recommended by CDC (especially those related to contact between an ill mother and well newborn). Despite data that showed that rapid influenza diagnostic testing had low sensitivity for 2009 H1N1,[15–18] these tests were used by one-third of obstetrician-gynecologists for a women presenting with symptoms of influenza, and obstetrician-gynecologists said that they were less inclined to prescribe antiviral medications

when a rapid test was negative. The reasons for the lack of adherence to CDC recommendations are unclear. These may include lack of awareness or disagreement with recommendations or possibly that certain recommendations might be more difficult to implement than others.

In April of 2008, CDC held a meeting of experts and partners to plan for a future influenza pandemic. Several issues were discussed at this meeting,[19] including nonpharmaceutical interventions, infection control, antiviral treatment and chemoprophylaxis, and influenza vaccines. Discussion of these critical issues with experts and partners (including representatives from ACOG) in a prepandemic setting might have facilitated their acceptance among obstetrician-gynecologists. Issues related to intrapartum and postpartum care of the ill pregnant woman were not discussed at this meeting, and these recommendations proved to be some of the more controversial and difficult to implement during the pandemic.[20] Based on input received on the recommendations on intrapartum and postpartum care initially released, CDC developed revised recommendations that were released later in the 2009–2010 season. Changes in recommendations might be responsible for some of the differences observed between recommendations and reported practices.

The finding that obstetrician-gynecologists' practices related to antiviral treatment were consistent with those recommended by CDC is encouraging, given that these recommendations for treatment of pregnant women with suspected or confirmed 2009 H1N1 influenza were substantially different from those in place before the emergence of 2009 H1N1[21] and the fact that early antiviral treatment of 2009 H1N1 was associated with a lower chance of severe illness.[3] The reasons that obstetrician-gynecologists adhered to these changes are unknown, especially given that, similar to other medications,[22] data on the safety of these medications during pregnancy available before and during the pandemic were limited.[19] However, the finding that more than one-quarter of respondents had observed pregnant women with pneumonia requiring intensive care and 5% had observed deaths in pregnant women that they attributed to influenza[9] likely played a role. In addition, the media coverage related to 2009 H1N1 influenza and pregnancy as a specific risk factor for severe complications[10] also probably had an impact. Obstetrician-gynecologists attitudes toward use of antiviral medications during pregnancy were also positive, with most obstetrician-gynecologists reporting that they were either not concerned or only slightly concerned about the safety of antiviral medications for the pregnant woman and her fetus.

Many obstetrician-gynecologists reported infection control practices, especially those in the inpatient intrapartum and postpartum setting, that varied widely and differed from CDC recommendations. A possible reason for this finding is that decisions regarding infection control might have been the responsibility of other professionals (eg, hospital infection control specialists, pediatricians, neonatologists), and thus, obstetrician-gynecologists might have been less familiar with these issues. The large percentage of "unsure" responses to questions about postpartum care and infant feeding is consistent with this possibility. However, a survey of neonatal intensive care directors in US hospitals regarding infection control practices for influenza in mother and newborn units identified a similar wide variation in practices.[20]

This study has several limitations. The response rate to our survey was low: physicians are typically a difficult group to survey; however, our response rate was somewhat higher than those reported in previous surveys of random samples of general ACOG members.[23] It is possible that respondents might differ from nonrespondents, although our nonresponse bias analysis did not suggest differences in a limited set of variables. The characteristics of our survey respondents were similar to those of US obstetrician-gynecologists,[24] and the characteristics of their patients, as reported by the respondent obstetrician-gynecologists, were similar to those of US women giving births.[25] However, based on results from a short follow-up survey sent to nonrespondents to the full survey, respondents might differ from nonrespondents in responses to some questions. In addition, the full survey was conducted in February–May 2010, at a time when the 2009 H1N1 vaccine was widely available and the main focus of influenza prevention efforts; thus, obstetrician-gynecologists might have been more likely to report discussion and implementation of nonpharmaceutical interventions earlier in the pandemic, before the vaccine became available. Practices are self-reported and respondents might provide responses that that they think are “correct,” rather than reflecting their true practices. However, this analysis showed important differences between certain public health recommendations and reported practices by obstetrician-gynecologists.

These data provide insight that might be helpful in the development and dissemination of guidance in a future influenza pandemic or other public health emergencies. These results suggest that seeking input in advance from key experts, partners, and practicing health care providers regarding recommendations for pregnant women is likely to be helpful. This input can be used to modify recommendations when appropriate and to identify recommendations for which additional efforts at dissemination may be necessary.

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TABLE 1

Characteristics of obstetrician-gynecologists who responded to the survey (n = 873)

Characteristics	Percentage[a] or mean (range)
Sex, %	
Female	51.1
Male	48.9
Average age, y	48.9 (29.7–84.6)
Average years in practice, y	16.7 (0.5–52)
Type of practice, %	
Group obstetrician-gynecologist practice	48.1
Solo practice	16.4
Multispecialty group	12.4
University full-time faculty and practice	11.2
Other	11.9
Consider primary care/preventive medicine an important part of practice, %	
Very important	45.8
Important	49.4
Not important	3.8
Average estimated % of patients eligible for Medicaid	33.4
Average estimated % of patients of certain race/ethnicity	
Non-Hispanic white	54.9
Non-Hispanic black	15.2
Hispanic	17.8
Asian/Pacific Islander	5.3
Native American	1.3
Multiracial	2.6
Other	1.0

[a]Numbers might not add to 100% because of rounding.

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TABLE 2

US obstetrician-gynecologists' preventive practices, 2008–09 and 2009–10 seasons

Practices	2008–09 influenza season, %	2009–10 influenza season, %	*P* value
Preventive practices used in outpatient settings			
Calling scheduled patients before appointment to ask about recent symptoms of ILI	2.1	4.4	< .05
Referring pregnant patients with ILI symptoms to primary care provider for treatment	34.9	40.6	NS
Rescheduling routine appointments for pregnant patients with ILI until they are healthy	30.7	51.2	< .0001
Questioning arriving patients about recent ILI symptoms and separating those with suspected ILI from those that are healthy	35.9	65.5	< .0001
Asking patients with ILI to wear facemasks in waiting area	28.0	59.6	< .0001
Always/frequently discuss specific preventive measures with pregnant women			
Discuss social distancing (eg, minimizing contact with ill individuals, avoiding crowded public gatherings)	58.0	79.2	< .0001
Promote frequent hand washing	63.0	87.6	< .0001
Discuss cough etiquette	43.7	62.7	< .0001
Discuss early symptom recognition	51.7	76.6	< .0001
Discuss prompt treatment of fever with fever-reducing medicines	57.7	75.9	< .0001

ILI, influenza like illness.

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TABLE 3

US obstetrician-gynecologists' practices, inpatient settings, 2009–10 influenza season

Practices[a]	Most of the time	Sometimes	Rarely or never	Unsure
Labor and delivery				
Questioning patients about recent flu-like symptoms	79.4%	12.7%	3.1%	4.8%
Isolating ill patients from healthy patients during labor and delivery	91.6%	4.5%	2.1%	1.9%
Asking ill patients to wear a surgical mask during labor and delivery	73.9%	9.8%	10.5%	5.7%
Requiring ill mothers to wear a surgical mask before holding their healthy newborns immediately after delivery	57.7%	12.2%	20.2%	9.8%
Limiting visitors to healthy persons who are necessary for the patient's emotional well-being and care	81.6%	10.4%	5.5%	2.5%
Postpartum				
Separating ill mother from her healthy newborn immediately after delivery	23.6%	16.9%	40.8%	18.7%
Rooming-in between convalescent mother and her healthy newborn after delivery with no precautions	18.7%	14.2%	39.1%	28.1%
Rooming-in between convalescent mother and her healthy newborn after delivery under droplet precautions	31.5%	22.5%	14.8%	31.1%
Healthy newborn is separated from ill mother and moved to well infant nursery in proximity to other newborns	13.7%	12.4%	36.9%	37.0%
Healthy newborn is separated from ill mother and moved to well infant nursery but apart from other newborns	15.2%	15.2%	29.3%	40.4%
Healthy newborn is separated from ill mother and moved to special care nursery	9.3%	9.7%	43.1%	38.0%
Healthy newborn is separated from ill mother and moved to NICU	6.2%	6.1%	50.9%	36.8%
Infant feeding				
Discouraging ill mothers from breastfeeding their healthy newborns (directly or via expressed milk)	6.5%	7.5%	63.8%	22.2%
Encouraging ill mothers to express breast milk to enable a well person to feed their infant	19.4%	19.3%	32.1%	29.3%
Encouraging ill mothers to wear a face mask while directly breastfeeding their healthy newborns	43.9%	19.0%	14.1%	23.0%
Encouraging ill mothers to wash their hands with soap and water before breastfeeding	75.0%	7.0%	3.0%	15.1%
Encouraging ill mothers to observe respiratory etiquette guidelines	69.4%	10.9%	3.1%	16.6%

NICU, neonatal intensive care unit.

[a]For women with suspected or confirmed influenza-like illness.

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TABLE 4

US obstetrician-gynecologists' practices: influenza diagnostic testing

Practices	**%**
Diagnostic test most likely to use for pregnant patient presenting with fever (>100° F) and cough and/or sore throat	
Rapid antigen test	33.2
DFA	2.0
RT PCR for seasonal flu	7.8
RT PCR for H1N1	14.9
Viral culture	4.8
IgG and IgM	2.7
Clinical diagnosis	55.3
Interpreting on-site rapid antigen testing for influenza	
With a negative test result, I would not prescribe antivirals	9.3
With a negative test result, I am less inclined to prescribe antivirals	44.0
I do not use a negative test result to make a decision about prescribing antivirals	46.8
Always or frequently ordering rapid influenza diagnostic test for suspected influenza-like illness in specific groups of pregnant patients	
Healthy pregnant women	29.1
Pregnant patients with underlying chronic condition	40.7
Pregnant patients with prepregnancy obesity	31.9

DFA, data for analysis; *IgG*, immunoglobulin G; *IgM*, immunoglobulin M; *PCR*, polymerase chain reaction; *RT*, room temperature.

Rasmussen. Public health recommendations for 2009 H1N1influenza. Am J Obstet Gynecol 2012.

TABLE 5

US obstetrician-gynecologists' attitudes and practices: antiviral medications

Attitudes and practices	Low-risk women, %	High-risk women, %	*P* value
Practice of prescribing antivirals for pregnant women with influenza-like illness symptoms			
Prescribed based solely on clinical evaluation	61.1	63.9	NS
Perform clinical evaluation and testing but prescribed before test results available	28.0	30.5	NS
Prescribed only after test results confirm influenza	8.7	3.3	< .0001
Concerns about the safety of antivirals for pregnant woman and/or her fetus			
Very concerned	3.1	3.7	NS
Concerned	6.8	7.5	NS
Slightly concerned	31.2	28.1	NS
Not concerned	59.0	60.8	NS
Offering antiviral chemoprophylaxis against 2009 H1N1 influenza to specific groups of pregnant patients			
Patient concerned about possible exposure while attending a public event	15.0	31.6	< .0001
Patient whose household member has confirmed 2009 H1N1 influenza	85.9	91.4	< .01
Patient whose household member has suspected 2009 H1N1 influenza	61.5	80.2	< .0001
Patient who provides care to patients and has an exposure	68.2	78.5	< .0001
Patient who works as a teacher in an elementary school or day care and has an exposure	63.6	75.7	< .0001

Rasmussen. Public health recommendations for 2009 H1N1 influenza. Am J Obstet Gynecol 2012.