American Journal of Infection Control 42 (2014) e65-e70

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major article

General influenza infection control policies and practices during the 2009 H1N1 influenza pandemic: A survey of women's health, obstetric, and neonatal nurses

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Key Words:
Hospital policy and practice
H1N1 pandemic
Labor and delivery
Hospital nursery
CDC guidance

Background: An evaluation of infection control practices was conducted following the release of the Centers for Disease Control and Prevention (CDC) guidance regarding the care of pregnant women during the 2009 H1N1 influenza pandemic. This paper describes 9 general hospital practices.

Methods: A questionnaire was distributed electronically to 12,612 members of the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN). Respondents (N = 2,304) who reported working in obstetric or neonatal settings during the pandemic completed the questionnaire.

Results: Most (73%) respondents considered the Centers for Disease Control and Prevention's guidance very useful. Significantly more reported a written hospital policy for each practice during versus before the pandemic. Six of the 9 practices were implemented most of the time by at least 70% of respondents; the practices least often implemented were mandatory vaccination of health care personnel involved (52%) and not involved (34%) in direct patient care and offering vaccination to close contacts of newborns prior to discharge (22%). The most consistent factor associated with implementation was the presence of a written policy supporting the practice at the respondent's hospital.

Conclusion: We offer a descriptive account of general hospital infection control policies and practices during the 2009 H1N1 pandemic. Factors associated with reported implementation may be useful to inform planning to protect women and children for future public health emergencies.

The first identified cases of novel 2009 influenza A (H1N1) were reported in April 2009.[1] The Department of Health and Human Services declared a national public health emergency on April 26, 2009; this emergency was in place through June 2010. During the 2009 H1N1 influenza pandemic, the Centers for Disease Control and Prevention (CDC) released guidance regarding the care of pregnant women who entered hospital settings ill with suspected or confirmed influenza; this guidance supported the management of these women from labor and delivery through postpartum and newborn care.[2,3] The specific guidance was necessary because pregnant and early postpartum women were identified as a high-risk group, experiencing increased morbidity and mortality because of pandemic (H1N1) 2009 influenza.[4-8] Public health and medical professionals were concerned about the health of pregnant and early postpartum women; possible transmission of the virus to immunologically vulnerable newborns; and general transmission to other individuals in the hospital including health care personnel, visitors, and other hospitalized patients. The guidance was based on proceedings from a meeting of experts convened by the CDC in April 2008 to develop a comprehensive public health approach for pregnant women in preparation for a future influenza pandemic[9] and a literature review conducted early in the pandemic that considered the potential burden of disease and routes of transmission affecting newborns.[10]

Because the CDC guidance was released quickly in response to the public health emergency, there was no time to assess feasibility prior to its release. Anecdotally, during the pandemic, some hospitals disputed specific recommendations, and others reported

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Conflicts of interest: None to report.

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http://dx.doi.org/10.1016/j.ajic.2014.02.022

challenges with implementation. Following the pandemic, the CDC, in collaboration with the American Academy of Pediatrics (AAP) and the Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN), initiated a retrospective, cross-sectional assessment of the levels of and difficulty with implementation of select CDC recommended practices in hospitals in the United States. This report is one of a series of 3 summarizing the findings of that assessment completed by obstetric and neonatal nurses regarding infection control practices at their hospitals during the pandemic; the other reports have been published elsewhere.[11,12] The specific focus of this report is hospital visitation, discharge, personnel, and nonpersonnel vaccination policies and practices.

METHODS

We conducted a cross-sectional, online survey from March through April 2011 with members of the AWHONN. We sought to limit our sample to nurses who worked in inpatient settings during the pandemic and thus excluded those who worked in academia, ambulatory care, home health care or public health; those who were self-employed or not working; and those who spent the majority of their time conducting research. After these exclusions, an invitation to participate in the survey was sent via e-mail to 12,612 AWHONN members with listed e-mail addresses. The initial survey question asked whether the potential respondent provided or planned for inpatient care in obstetric or neonatal settings during the 2009 H1N1 pandemic, defined as April 2009 to June 2010 for purposes of this survey. Respondents who answered "no" were not eligible to participate and were skipped to the end of the survey where they were thanked for their time. Up to 3 follow-up invitations to participate in the survey were sent to nonrespondents via e-mail. Potential respondents were offered a small incentive in the form of entry into a drawing for 1 of 20 registration waivers to the upcoming 2011 annual AWHONN national conference. Of 12,612 AWHONN members who received invitations to participate, 767 were identified as ineligible (ie, did not provide or plan for inpatient care in obstetric or neonatal settings during the pandemic) and thus excluded, and 2,641 eligible nurses completed the online survey, for a final response rate of 22% (2,641/11,845).

The survey instrument was developed collaboratively by representatives from the AAP, the AWHONN, and the CDC and piloted prior to implementation. Questions were asked on nurse and inpatient facility characteristics; usefulness of various sources of infection control guidance during the pandemic; existence of hospital written policies before, during, and after the pandemic that aligned with the CDC guidance; implementation of practices during the pandemic; as well as level of difficulty with implementation. For questions on existence of hospital written policies, implementation of practices, and level of difficulty with implementation, the survey queried about labor and delivery practices, postpartum and newborn care practices, and general hospital practices.

This paper summarizes findings related to 2 sets of general hospital practices (ie, visitation and discharge practices and personnel and nonpersonnel vaccination practices). Because we were interested in comparing the existence of hospital policies at multiple time points, the analysis was restricted to 2,304 respondents who had not changed institutions since April 2009. The following practices are examined in the present paper: visitation practices, both limiting visitors to healthy adults who are necessary for the patient's emotional well-being and care, and prohibiting visitation of children; discharge practices, composed of informing/instructing mothers on ways to prevent transmission of influenza and other viral infections and on how to monitor infants for signs of influenza; personnel practices, including institution of sick leave policy that discourages health care personnel from reporting to work with symptoms of influenza and mandatory influenza vaccination(s) of health care personnel involved in direct patient care and/or not involved in direct patient care; and, finally, nonpersonnel vaccination practices, offering recommended influenza vaccination(s) to unvaccinated healthy postpartum mothers and to unvaccinated healthy family members and other close contacts of infants, prior to hospital discharge.

To assess existence of hospital policies, respondents were asked if their hospital had a written policy supporting these practices before, during, and after the 2009 H1N1 influenza pandemic, defined as between April 2009 and June 2010 for the purposes of the survey. To assess practices of care, respondents were asked how often they implemented these practices ("most of the time," "sometimes," "rarely," "never," or "unsure"). To assess difficulty with implementation, respondents were asked how difficult it was to implement the practices ("very difficult," "moderately difficult," "somewhat difficult," "not difficult," or "not applicable"). Respondents were not asked about difficulty with implementation for the personnel practices for which they were unlikely to be responsible, ie, sick leave policy and mandatory influenza vaccination of health care personnel.

Data analysis utilized *t* tests, χ^2 tests, or Fischer exact tests as appropriate. In all data tables, percentages were estimated excluding missing data. All data were analyzed using SPSS 18 (SPSS Inc, Chicago, IL). Because the primary purpose of the survey was to evaluate public health practice, the assessment was determined exempt from Institutional Review Board review by the Centers for Disease Control and Prevention.

RESULTS

Characteristics of respondents

Survey respondents were almost all female (99.7%, data not shown) and, on average, highly experienced, with a majority (57%) reporting 21 years or more in clinical practice and another 23% reporting 11 to 20 years (Table 1). Almost one quarter (24%) reported master's level preparation. A majority (52%) reported their position during the pandemic as "staff nurse," and 28% reported "nurse manager or executive." Most nurses worked during the pandemic in intrapartum (44%) or combined (33%) units. Nearly half of respondents reported working in a hospital with a level 3 neonatal intensive care unit, and most worked in hospitals with 20 or fewer labor and delivery beds. The majority worked in settings in which care was organized with a separate mother/baby postpartum unit with a separate normal newborn nursery, and the vast majority (91%) reported that their hospitals had a certified lactation specialist available.

Perceived usefulness of guidance

Nearly all respondents perceived the CDC as providing useful information for infection control during the pandemic, with 73% indicating that CDC guidance was "very useful" (Table 1). A majority (63%) also thought that their own hospitals provided very useful information. Generally, significantly higher proportions of those with more experience, higher levels of training, and more responsibility for planning and management of care reported that the