Attitudes of Wisconsin Pediatricians Toward Influenza Immunization

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ABSTRACT

Objective: Determine the influenza immunization practices of Wisconsin pediatricians in response to evolving influenza prevention strategy in the United States.

Design: Two hundred fifty members of the Wisconsin Chapter of the American Academy of Pediatrics were surveyed prior to the 2004 - 2005 influenza season about their expectations for implementing the latest and future influenza vaccination recommendations for children and their use of trivalent inactivated influenza vaccines free of thimerosal as a preservative.

Results: Ninety-two percent of respondents expected to vaccinate most medically high-risk children against influenza, but only 53% would recommend influenza vaccine for most of their household contacts. Although 57% planned to vaccinate most healthy children ages 6 months to 23 months, just 27% thought the majority of household contacts of healthy infants under 23 months of age would be vaccinated. Fewer than 24% favored universal influenza vaccination for the majority of healthy school-aged children. Seventy percent had little or no concern about recommending thimerosal-containing influenza vaccines, but 60% agreed or strongly agreed thimerosal-free vaccine availability would increase parental acceptance of vaccinating their children.

Conclusion: Although Wisconsin pediatricians are aware of the importance of preventing influenza disease in children, barriers to universal influenza vaccination of children and key household contacts remain.

INTRODUCTION

Pediatric deaths due to influenza complications are unusual but not inconsequential[1] with infants aged 0 to 6 months having the highest mortality rate from influenza among all children.[2] Eighty percent of influenza-associated hospitalizations under 5 years of age occur in healthy children less than 2 years old,[3] and the rate of influenza-related hospitalizations for children aged 0 to 1 years eclipses that of the elderly.[4] Influenza also may play an important role in the pathogenesis of acute otitis media with influenza complications accounting for a 10% to 30% increase in the number of antimicrobial courses during the influenza season.[5]

Children appear to be important in disease propagation during influenza epidemics as a consequence of significantly higher attack rates approaching 40% and protracted high levels of influenza viral shedding.[6,7] During pandemics, the elderly are often at the end of a community transmission chain that begins with children.[8]

In 2004, the Advisory Committee on Immunization Practices (ACIP) expanded the recommendations for annual influenza vaccination to include healthy children 6 months to 23 months of age in recognition of their increased morbidity due to influenza.[9] These recommendations were broadened in 2006 to include all healthy children aged 6 months to 59 months.[10] By August 2008, the Centers for Disease Control and Prevention (CDC) recommended all children 6 months through 18 years of age be immunized yearly against influenza beginning no later than the 2009-2010 influenza season.[11] Despite the increased emphasis on immunizing healthy children against influenza, success has been elusive in immunizing even the highest risk patients in the United States.[12] In the 2006-2007 influenza season, only 35% of children aged 5 to 17 years with high risk medical conditions had received influenza vaccine, and just 26% of household contacts of persons of high risk including children under 5 years of age had been immunized against influenza.[13] Less than 30% of children in the United States aged 6 months through 18 years received influenza vaccine during the 2009 - 2010 pandemic and less than 25% of those under 9 years of age given their first dose of influenza vaccine received the recommended 2-dose regimen.[14]

Current influenza prevention strategy requires intensive surveillance, the availability of antiviral drugs, and the attain-

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ment of sustained levels of immunity with vaccine against the influenza virus, particularly in children. Mass immunization of susceptible school children has been shown to provide protection against influenza disease for unvaccinated adults, including the elderly.[15]

Modern trivalent inactivated influenza vaccine (TIV) has been demonstrated to be safe and effective in healthy and medically at-risk children greater than 6 months of age.[16] Live attenuated influenza vaccine (LAIV) is now recommended for healthy children and adults ages 2 to 49 years as an effective and safe intranasal option for patients who desire an injection-free regimen.[17]

Many parents remain skeptical of influenza vaccine safety due to an ongoing disinformation campaign on the Internet and in the popular media. As of summer 2004, up to 12% continued to refuse to vaccinate their children against influenza because of concerns the vaccine causes influenza or contains thimerosal.[18] The balance of safety research on thimerosal fails to support any association with neurodevelopmental or autism spectrum disorders.[19,20] Supplies of TIV vaccines free of thimerosal as a preservative continue to be limited.

Because physician recommendation for use of vaccination has been shown to strongly predict influenza vaccination status in children,[21] we surveyed Wisconsin pediatricians at the onset of the 2004-2005 influenza season to assess: (1) their knowledge about influenza prevention in children; (2) their past and anticipated influenza immunization practices; and (3) their use of thimerosal-free influenza vaccine preparations.

METHODS

This study was approved and funded by the Executive Committee of the Wisconsin Chapter of the American Academy of Pediatrics (WI-AAP).

Subjects and Design

The WI-AAP comprises more than 900 pediatricians. Two hundred fifty members were selected randomly from a list of nearly 400 actively practicing general pediatricians who historically provide routine immunization services. The WI-AAP Executive Committee determined the study was in compliance with AAP regulations governing projects involving AAP membership. Pediatricians selected were sent a 1-page, 2-sided survey by postal mail along with return postage and a cover letter explaining the study. The survey was sent September 16, 2004; 4 weeks later members who had not returned a survey were sent an e-mail reminder or a postcard if e-mail contact was not possible.

Survey Instrument

The survey contained closed-ended questions about expected influenza vaccination plans for the 2004-2005 season, identification of populations who would receive influenza vaccine, and whether there was agreement with national policy statements targeting pediatric populations with influenza vaccine in current and future influenza seasons. They were also polled about their past experience with and future plans for use of thimerosal-free TIV in their practices. Survey answer options used were: "percentage of patients in the practice expected to receive influenza vaccine" (1 choice allowed for 4 options: <25%, 25%-50%, 50-75%, and >75%) and Likert formats with 5-point selection scales (1 = strongly disagree or worse to 5 = strongly agree or best) for questions concerning immunization practices. Selected ranges of percentages were used for proportions of children who would receive thimerosal-free vaccines. Returned surveys were assigned a unique numerical identifier to facilitate targeted reminders. No identifying data of individual pediatricians were maintained.

Statistical Analysis

Categorical data were summarized as frequencies and percentages. All quantitative data were summarized by medians and ranges. Respondents who no longer routinely vaccinated children were excluded in the final results. The Wilcoxon Signed Rank test was used to compare response patterns of physicians' past experience with their future plans for use of the thimerosal-free influenza vaccine. Comparisons of categorical data between groups were performed using a chi-square test or Fisher's exact test whenever appropriate. The Wilcoxon rank sum test was used to compare quantitative data. All statistical tests were 2-sided, and P values of $< .05$ indicated statistical significance. Statistical analyses were performed using SAS version 6.12 software (SAS Institute, Cary, NC).

RESULTS

Of 250 surveys sent, 136 (54%) were returned, with 5% of respondents no longer vaccinating children. The survey collected respondent ZIP codes and determined all 5 Wisconsin health regions were proportionally represented relative to urban, suburban and rural practices in the state. Ninety-five percent of respondents agreed or strongly agreed that children contribute substantially to the transmission of influenza within the community, and 84% agreed or strongly agreed that children under the age of 2 years had a high risk of hospitalization with influenza infection. Ninety-eight percent of respondents agreed or strongly agreed TIV is safe for children, 94% agreed or strongly agreed that TIV effectively prevents influenza in children, while 97% agreed or strongly agreed that TIV reduces the severity of influenza in the vaccinated child.

When asked to whom they would administer TIV during the coming season, 86% of respondents expected to vaccinate at least three-fourths of children in their practices with "high-risk" medical conditions (Figure 1). Fifty-seven percent expected to vaccinate at least three-fourths of their healthy

patients aged 6 months to 23 months while another 26% believed they would reach between one-half and three-fourths of their patients in that age group. Fifty-three percent expected to administer TIV to at least three-fourths of the pediatric-aged household contacts of "high-risk" children, and an additional 28% of pediatricians expected to vaccinate between half and three-fourths of their patients in the high-risk contacts group. Twenty-seven percent of respondents planned on vaccinating at least three-fourths of their patients in the group of household contacts of healthy children from birth to 23 months of age while an additional 23% of the pediatricians expected to immunize between half to three-fourths of their patients in households within that same cohort. Twenty-four percent of respondents planned to vaccinate the majority of older healthy children, aged 24 months to 18 years in their practices. Eighty-seven percent of Wisconsin pediatricians reported vaccine availability would strongly influence which cohorts would receive influenza vaccine.

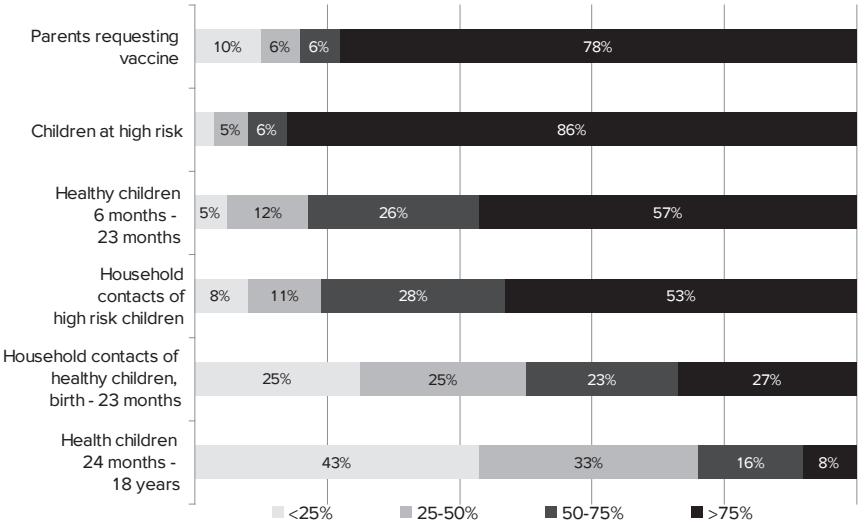

Figure 1. Pediatrician vaccination plans for the 2004-2005 season: proportion of each patient group expected to receive trivalent inactivated influenza (TIV) in each of 131 respondent practices.

Seventy percent of respondents indicated they had little or no concern about recommending the use of TIV that contained thimerosal as a preservative (Figure 2). However, 60% of respondents agreed or strongly agreed that thimerosal-free TIV availability would increase parental acceptance of vaccinating their children. When asked what percentage of children ages 6 months to 23 months received thimerosal-free TIV during the 2003 - 2004 season, 56% (60 out of 108 respondents) reported at least 10% of their patients received it. When asked about anticipated use of thimerosal-free TIV during the 2004 - 2005 influenza season, 78% of respondents (89 of 114) expected to give it to 10% or more of the children in their practice, a significant increase over the 2003 - 2004 season ($P < 0.001$).

DISCUSSION

The results from this survey suggest Wisconsin pediatricians enjoy a solid knowledge base with regard to pediatric influenza disease epidemiology and severity. However, despite strong pediatric influenza vaccine recommendations from ACIP and the American Academy of Pediatrics Committee on Infectious Diseases (AAP-COID) for the 2004 - 2005 season, this survey revealed a high degree of variability as to who is likely to receive influenza vaccine in the office setting.

Wisconsin pediatricians appeared to respond positively to the case made for immunizing the cohort age 6 months to 23 months but were less likely to pursue a "cocooning strategy" to routinely recommend vaccination of other groups such as healthy household members of the medically high-risk children or healthy children less than 23 months of age. If the United States hopes to pursue a universal influenza vaccination program and promote a cocooning concept to protect vulnerable cohorts, efforts must be made to: (1) further increase and stabilize the influenza vaccine supply appropriate for pediatric use; (2) educate physicians and nurses on the rationale for universal influenza vaccination in the context of pandemic planning, cocooning, and containing influenza within the community; (3) assist the medical home in developing efficient models of immunization delivery during influenza season that include a means to provide a 2-dose regimen when recommended for children 6 months to 9 years old; and (4) provide financial incentives to make immunization services economically desirable for the private sector.[22-24]

A paradox also exists in physician behavior concerning the safety of influenza vaccine containing thimerosal as a preservative when compared to actual usage in practice. Although most Wisconsin pediatricians reported little concern about the safety of TIV containing thimerosal, they anticipated an increase in the use of thimerosal-free vaccine during the 2004 - 2005 influenza season in response to pressure from parents with concerns about thimerosal. Discussing the difference between good science and the pseudoscience that permeates the thimerosal controversy is time-consuming and emotionally charged. Wisconsin pediatricians appear willing to use thimerosal-free influenza vaccine to defuse this issue.

The conclusions drawn from this survey are supported by a number of strengths in design. A decade of repeated WI-AAP immunization practices surveys has shown that response rates

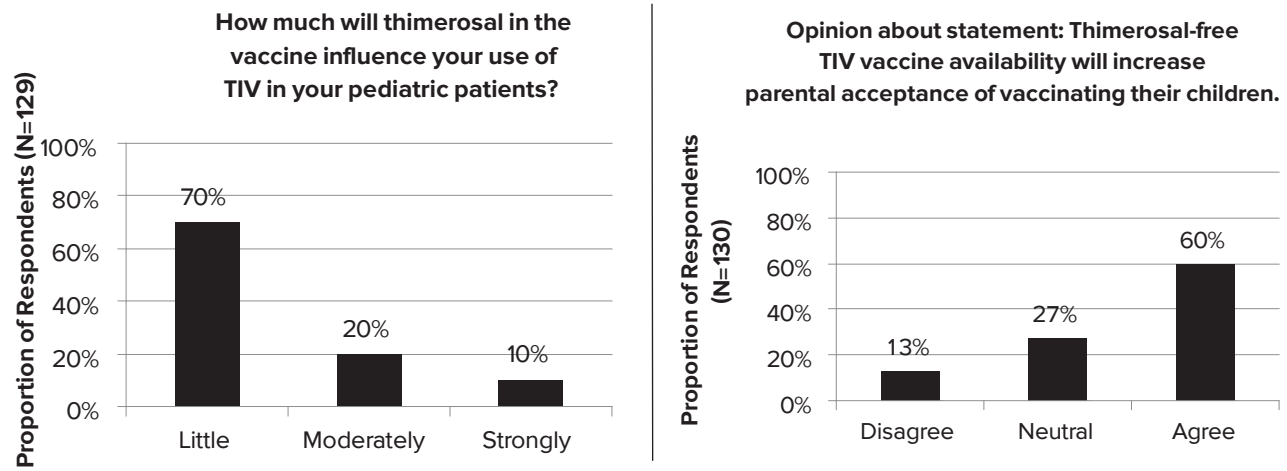

Figure 2. Pediatrician opinions about thimerosal in trivalent inactivated influenza (TIV): influence on use and parental acceptance.

over 50% are typical and exceptional for private practice surveys in general. The respondents represent a diverse collection of practice styles in urban, suburban, and rural communities. Wisconsin pediatricians historically work closely with their public health counterparts, and together they have substantial influence on how quickly national recommendations are adopted. This survey was performed in the late summer when community and state influenza vaccination promotion programs are most active.

This survey is subject to a number of limitations. The survey was completed within a time frame when there were major problems with the influenza vaccine supply. Although nearly all surveys were returned before this issue was publicly acknowledged, rumors about impending influenza vaccine shortages could have influenced some of the respondents' answers. There is a potential for response and recall bias because the sponsoring organization had engaged in an aggressive influenza vaccination education campaign through a chapter newsletter published 3 times a year. Non-responders may opt out of responding to a survey that might reflect their disagreement with AAP immunization policies. The survey was given only to pediatricians in Wisconsin; therefore, the conclusions may not be representative of pediatricians nationally or other Wisconsin health care professionals who vaccinate children.

CONCLUSION

Although Wisconsin pediatricians appear knowledgeable about the consequences of influenza disease in children, there is inconsistency in the provision of influenza vaccine to children in the state. Clearly, barriers need to be identified and overcome if the goal of yearly influenza vaccination of children 6 months through 18 years is to be realized. Physician advocacy for any new vaccine initiative is often driven by factors beyond good vaccine science. The economic and infrastructure strain on pediatric offices attempting to comply with a seasonal universal influenza immunization campaign may require consideration of alternate immunization sites such as schools and pharmacies that could displace, to some degree, the traditional medical home as the preferred site of immunization delivery.

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