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Physicians' Human Papillomavirus Vaccine Recommendations, 2009 and 2011

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Abstract

Background—Physician recommendation is a key predictor of human papillomavirus (HPV) vaccine uptake. Understanding factors associated with recommendation is important for efforts to increase current suboptimal vaccine uptake.

Purpose—This study aimed to examine physician recommendations to vaccinate female patients aged 11–26 years, in 2009 and 2011, at 3 and 5 years postvaccine licensure, respectively. A second aim was to identify trends in factors associated with vaccine recommendation for ages 11 and 12 years.

Methods—Nationally representative samples of physicians practicing family medicine, pediatrics, and obstetrics and gynecology were randomly selected from the American Medical Association Physician Masterfile (n=1538 in 2009, n=1541 in 2011). A mailed survey asked physicians about patient and clinical practice characteristics; immunization support; and frequency of HPV vaccine recommendation ("always" = >75% of the time vs other). Analyses were conducted in 2012.

Results—Completed surveys were received from 1013 eligible physicians (68% response rate) in 2009 and 928 (63%) in 2011. The proportion of physicians who reported "always" recommending HPV vaccine increased significantly from 2009 to 2011 for patients aged 11 or 12 years (35% vs 40%, respectively; p=0.03), but not for patients aged 13–17 years (53% vs 55%; p= 0.28) or 18–26 years (50% vs 52%; p=0.52). Physician specialty, age, and perceived issues/barriers to vaccination were associated with vaccine recommendation for patients aged 11 or 12 in both years.

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Conclusions—Results suggest a modest increase in recommendations for HPV vaccination of girls aged 11 or 12 years over a 2-year period; however, recommendations remain suboptimal for all age groups despite national recommendations for universal immunization.

Background

The Advisory Committee on Immunization Practices (ACIP) recommended routine human papillomavirus (HPV) vaccination for girls aged 11 or 12 years in 2007,[1] offered guidance for male vaccination in 2009,[2] and recommended routine male vaccination in October 2011.[3] Despite these recommendations, HPV vaccine uptake is low in the U.S. In 2009, ~20% of girls aged 11 or 12 years received ≥1 dose, a level that increased only slightly by 2012.[4] Although HPV vaccine initiation increased among older adolescent girls aged 13–17 years, with ~44% receiving ≥1 dose in 2009[5] and 53% in 2011,[6] these levels remain suboptimal. Without continued efforts to increase series initiation and completion, the *Healthy People 2020* objective to have 80% of girls receive three HPV vaccine doses by age 13–15 years will not be attained.[7]

Physician recommendation is central to increasing the prevalence of HPV vaccination.[6] The primary aim of the current study was to examine trends in physician recommendation to vaccinate in early (aged 11 or 12 years); middle (aged 13–17 years); and late-adolescent/young adult (aged 18–26 years) women at 3 and 5 years postvaccine licensure (2009 and 2011, respectively). A second aim was to identify trends in factors associated with physicians' HPV vaccine recommendations for early-adolescent girls, the target group for routine vaccination.[1]

Methods

Sample and Recruitment

Two cross-sectional surveys were conducted with separate, nationally representative, stratified random samples of family physicians (FPs); pediatricians; and obstetricians/gynecologists (OBGYNs) selected from the American Medical Association Physician Masterfile. The sampling and recruitment methods used in 2009[8] were replicated in 2011. The university's IRB granted a waiver of documentation of informed consent.

Sample sizes and response rates for the first survey mailed in April 2009 are reported elsewhere.[8] In April 2011, surveys were mailed to 746 FPs, 473 pediatricians, and 322 OBGYNs; 43 surveys were undeliverable and 15 were ineligible. The study team requested that completed surveys be returned by July 2011, but 30 additional surveys were accepted before the team began examining data in February 2012. Completed surveys were received from 928 eligible physicians: 406 FPs, 322 pediatricians, and 200 OBGYNs, for an overall response rate of 62.6%.

Instrument

Survey development and items were previously described.[8] In short, the surveys assessed demographic, practice, and patient characteristics; HPV-related knowledge; vaccination issues/barriers; strategies to ensure vaccine completion; and vaccine recommendation. Of note, physicians were asked to report "issues" related to immunizing patients against HPV in 2009, whereas the term "barriers" was used in 2011. The change in terms reflects an adaptation based on participant feedback in 2009.

Physicians were asked: *In the past 12 months, how often did you* recommend *the HPV vaccine to your female patients?* Physicians reported separate estimates for early, middle, and late adolescents/young adults. Response options included *never* (0%); *rarely* (1%–25%);

sometimes (26%–50%); *often* (51%–75%); *always* (>75%); or *do not see patients in this age group*. Responses were dichotomized into *always* or *other* because *always* most closely reflects recommendation practices aligned with ACIP guidelines for routine vaccination.[1]

Data Analysis

Pearson Chi-square tests were conducted to investigate differences in variables by study year and the proportion of "always" recommending HPV vaccine between study years. Simple logistic regression models were used to determine factors associated with "always" recommending HPV vaccine for early adolescents, and significant variables were included in multivariable logistic regression analysis using the backward elimination approach (significance level of stay=0.05), with physician specialty included as a design variable in the final model. Analyses used two-tailed significance tests ($p<0.05$) and were conducted in 2012 using SAS 9.3. Respondents who reported not seeing patients in an age group were excluded from age-specific analyses.

Results

Significant differences between study years were observed for specialty; physician age; daily patient volume; Vaccines for Children (VFC) enrollment status; referral for uninsured and underinsured patients; number of strategies used to ensure vaccine series completion; and most individual physician issues/barriers (Appendix A, available online at www.ajpmonline.org). Both samples were similar to the national population with respect to gender and region; however, more FPs and pediatricians in the current samples were in the older age groups (data not shown).

The proportion of physicians who reported "always" recommending HPV vaccine increased significantly from 2009 to 2011 for early adolescent girls (34.6% vs 40.0%, respectively; *p*-difference =0.03), but not for middle adolescents (52.7% vs 55.3%; *p*-difference=0.28) or late adolescents/young adults (50.2% vs 51.8%; *p*-difference =0.52). Significant differences over time in specialty-specific vaccine recommendation practices were not observed.

In multivariable logistic regression, specialty, physician age, and perceived issues/barriers were significantly associated with vaccine recommendation in both study years (Table 1). Pediatricians (vs FPs) were more likely to "always" recommend vaccination. OBGYNs also were more likely to recommend vaccination in 2011. In 2009, physicians aged 40–49 years (vs 50–65 years) had greater odds of vaccine recommendation, whereas those aged 25–39 years had greater odds of recommendation in 2011. Physicians reporting low (vs high) overall HPV vaccination–related issues/barriers had greater odds of recommendation in both years. A medium issue/barrier score also was associated with greater odds of recommendation in 2011.

Two variables were associated with "always" recommending vaccination in 2009 (but not 2011): Hispanic/Latino physician ethnicity (positive association) and being a non-VFC provider (inverse association). Two variables were associated with recommendation only in 2011: physicians working in a nonprivate practice (vs private practice) had greater odds of vaccine recommendation, and physicians who reported using 0 (vs ≥2) strategies to ensure 3-dose series completion had lower odds of recommending HPV vaccine. When data from both years were included in a single multivariable model with time as a covariate, similar results were observed (Table 1). The overall "always" recommendation showed a marginally significant increase from 2009 to 2011.

Discussion

Across both years, physician specialty, age, and perceived HPV vaccination issues/barriers were associated with "always" recommending HPV vaccine to early-adolescent girls. Mirroring recommendations for other vaccines,[9–13] pediatricians were more likely than FPs to recommend HPV vaccination. Although reasons for differences in HPV vaccine recommendations by physician specialty are largely underexplored, research on other vaccines suggests a need to further examine the potential impact of financial barriers,[9,14] importance of immunizations in the practice,[15] and concerns about vaccine safety[16] on FPs' HPV vaccine recommendation practices.

Physicians aged 40–49 years (vs 50–65 years) were more likely to "always" recommend vaccination in 2009, whereas younger physicians (aged 25–39 years) were more likely to recommend in 2011. Given the increasingly well-documented causal role of HPV infection in a variety of cancers,[17,18] perhaps this difference reflects greater emphasis on the importance of HPV in disease etiology in medical education for more recent graduates. Younger physicians, who tend to be in practice for fewer years than their older peers, may also be more receptive to adopting new clinical practice innovations.[19]

Consistent HPV vaccine recommendations were linked to physicians' perceived issues/barriers related to immunizing patients against HPV. This finding parallels other studies reporting that vaccination barriers were associated with physicians not strongly recommending[20] or offering HPV vaccine.[21] Financial issues were the top barriers in the authors' 2011 survey and in other research.[22–24]

Results from 2011 highlight additional intervention targets to increase HPV vaccine recommendation: practice location and office-based reminder strategies to ensure 3-dose completion. Nonprivate practice office settings (e.g., HMO clinic, community health center) may require providers to be familiar with fewer coverage considerations since most or all patients are covered by a similar health plan (e.g., HMO plan for HMO clinic, Medicaid for community health center) that may provide coverage for preventive services. Client and provider reminder/recall interventions are strongly recommended to improve vaccination coverage.[25] Physicians who follow these recommendations may be more committed to HPV vaccination. Additionally, physicians with staff to lead immunization improvement efforts are more likely to use reminder/recall messages.[26]

This study's strengths include national samples, high response rates, and an examination of physician recommendations over time. However, limitations include the fact that physicians may have reported socially desirable responses regarding practice behaviors. Second, terms pertaining to vaccination issues/barriers differed across study years; consequently, responses may not be directly comparable.

Third, other than the outcome variable, survey questions did not distinguish between male and female patients. By the 2011 survey, the ACIP offered permissive recommendations on male HPV vaccination (i.e., providers may proactively offer vaccination or vaccinate on request);[2,27] thus, physicians may have responded with one or both genders in mind. However, given that ~8% of U.S. adolescent boys received ≥1 dose of HPV vaccine, compared to 53% of girls,[6] physicians were likely mainly considering female patients. Finally, unique samples were not requested for each survey. The anonymity precludes identification of physicians who responded to both surveys; however, only 17 duplicate names were found across the initial mailing samples.

This study demonstrates that the change in consistent HPV vaccine recommendations to early-adolescent girls was modest, and to older adolescent grils was virtually nonexistent,

from 3–5 years postvaccine licensure. Consistent intervention targets include clinical specialty, physician age, and reducing barriers to immunizing patients. Emerging areas identified in 2011 include practice location and office-based reminder strategies to increase vaccine completion. To realize the public health benefits of HPV vaccination, there is a need for multilevel interventions that incorporate policy considerations (e.g., reimbursement); systems approaches (e.g., office-based reminder systems); and provider education.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Multivariable analysis for physicians "always" recommending HPV vaccine for early adolescents ("always" vs other), 2009 and 2011

	AOR (95% CI)		
Predictor	**2009**	**2011**	**Combined Years**
Specialty			
Family Physician	1.0 (ref)	1.0 (ref)	1.0 (ref)
Pediatrician	2.1 (1.5, 3.0)	3.3 (2.3, 4.7)	2.7 (2.0, 3.5)
Obstetrics/Gynecology	1.6 (0.9, 2.9)	2.0 (1.2, 3.3)	2.0 (1.3, 3.0)
Age (years)			
50–65	1.0 (ref)	1.0 (ref)	1.0 (ref)
40–49	1.8 (1.3, 2.7)	1.0 (0.7, 1.5)	1.3 (1.0, 1.7)
25–39	1.4 (0.9, 2.1)	2.0 (1.3, 3.1)	1.7 (1.2, 2.2)
Perceived issues/barriers to HPV vaccination			
High	1.0 (ref)	1.0 (ref)	1.0 (ref)
Medium	1.0 (0.7, 1.6)	1.7 (1.1, 2.6)	1.3 (1.0, 1.8)
Low	1.8 (1.2, 2.6)	2.4 (1.6, 3.6)	2.0 (1.5, 2.6)
Ethnicity			
Not Hispanic or Latino	1.0 (ref)	-	1.0 (ref)
Hispanic or Latino	2.4 (1.3, 4.4)		1.9 (1.2, 3.1)
Vaccines for Children provider			
Yes	1.0 (ref)		1.0 (ref)
No	0.5 (0.4, 0.8)	-	0.7 (0.5, 0.9)
Don't know	0.7 (0.4, 1.2)		0.9 (0.6, 1.3)
Primary clinical practice location			
Private practice office	-	1.0 (ref)	1.0 (ref)
Other		1.6 (1.1, 2.4)	1.4 (1.02, 1.8)
Strategies to ensure HPV vaccine completion			
2+	-	1.0 (ref)	1.0 (ref)
1		0.7 (0.5, 1.0)	0.8 (0.6, 1.0)
0		0.3 (0.2, 0.6)	0.4 (0.3, 0.6)
Study year			
2009	-	-	1.0 (ref)
2011			1.3 (1.0, 1.6)

Note: Specialty was forced into the model; other variables were selected through backward elimination (level of stay alpha=0.05).

HPV, human papillomavirus