



Published in final edited form as:

J Pediatr Adolesc Gynecol. 2012 June ; 25(3): 218–220. doi:10.1016/j.jpag.2012.01.003.

Gender differences among low income women in their intent to vaccinate their sons and daughters against human papillomavirus infection

Abbey B. Berenson, MD, MMS, PhD^{a,b} and Mahbubur Rahman, MBBS, PhD, MPH^{a,b}

^aCenter for Interdisciplinary Research in Women's Health, The University of Texas Medical Branch, Galveston TX 77555-0587

^bDepartment of Obstetrics and Gynecology, The University of Texas Medical Branch, Galveston TX 77555-0587

Abstract

Study Objective—The HPV vaccine was approved for use in males in 2009. The purpose of our study was to examine current intentions to vaccinate sons and daughters among low income women.

Design—A survey was administered to 322 mothers with a son or daughter 9–26 years of age to examine gender differences in intent to vaccinate their children.

Setting—Five public reproductive health clinics in southeast Texas, between August, 2010 and May, 2011.

Participants—The study population consisted of 322 women with 1 child 9–26 years of age.

Main Outcome Measures—Knowledge of HPV vaccine, intention to have son or daughter receive the HPV vaccine, and reasons for not vaccinating son or daughter.

Results—Women with only a daughter were more willing than those with a son to vaccinate their child (71% vs. 44%, $P<.001$). A similar scenario was observed for mothers of both daughters and sons (67% vs. 39%, $P<.001$). Mothers of sons as compared to daughters were less likely to consider their child at risk of HPV (27% vs. 12%, $P=.028$) while those with daughters were more concerned about side effects (54% vs. 33%, $P=.008$).

Conclusion—Educational interventions are needed to address the importance to mothers of vaccinating both their sons and daughters against HPV.

Keywords

human papillomavirus; HPV; vaccine; vaccine uptake; gender differences

© 2012 North American Society for Pediatric and Adolescent Gynecology. Published by Elsevier Inc. All rights reserved.

Corresponding author: Abbey B. Berenson, MD, MMS, PhD, Department of Obstetrics and Gynecology, The University of Texas Medical Branch, 301 University Blvd, Galveston, Texas 77555-0587, abberens@utmb.edu, Telephone: 409-772-2417, Fax: 409-747-5129.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Introduction

Over 25% of US women are infected with the human papillomavirus (HPV).¹ Males are also at risk with most estimates of prevalence 20%.² This virus is responsible for 70% of cervical cancer cases, most genital warts, and rarely cancer of the vulva, vagina, penis, anus, head and neck.³⁻⁵ One vaccine is now approved for use in both males and females 9–26 years of age.

Initiation of this vaccine at a young age is critical as prevalence of HPV increases every year from 14 to 24 years of age.¹ Thus, the decision to vaccinate is often made by the parent and is affected by their knowledge of the vaccine and attitudes about its use. Several studies have compared intent to vaccinate among male and female children and noted that attitudes did not differ by the child's gender.^{6,7} However, these studies were all conducted before the vaccine was recommended for males and thus their findings may no longer be valid. Furthermore, few studies have focused on low income women. The purpose of this study was to examine differences among low income mothers in their intent to vaccinate their sons vs. their daughters against HPV following the recommendation to vaccinate both genders. We hypothesized that mothers would be more willing to vaccinate daughters.

Materials and Methods

We conducted a self administered survey on health behaviors among women 16–40 years of age attending 5 publicly funded reproductive health clinics between August, 2010 and May, 2011. At the first appointment, all women are screened for financial eligibility by clinic staff in Financial Assistance Services. Screening occurs prior to placement in an examination room. Research staff members were not involved in financial screening to determine low income. A majority of women (88%) who receive care through UTMB's Regional Maternal and Child Health Program have a family income under \$29,000/year, and 63% of them earn less than \$15,000/year. Patients were approached by a research assistant in the privacy of the examination room and invited to complete a health survey. After obtaining oral informed consent, the research assistant left the room while the participant completed the survey. The instrument was collected at the conclusion of the examination. To ensure that participants completed the survey only once, we maintained a database of those who had previously completed the survey and compared it against the daily patient census. Those who had previously participated were not approached a second time. Women who agreed to participate were reimbursed \$5 for their time. Providers were not involved in the survey process.

For this study, participants were limited to women with 1 child 9–26 years of age. Information on demographics, attendance at religious gatherings, and sexual behavior were obtained by self-report. Knowledge about HPV vaccine was measured by asking, "Have you heard of a vaccine for HPV or cervical cancer?" and "Have you discussed the HPV vaccine with a health care provider?" Patients were first asked a series questions about daughters, then the same questions about sons, using the following: "Do you plan on having your [daughter(s)] [son(s)] vaccinated against HPV?" Responses included: "I don't have a [daughter][son] between the ages of 9 and 26;" "I have a [daughter][son] between 9 and 26 and [she][he] is already vaccinated or I plan to have [her][him] vaccinated;" "I have a [daughter][son] between 9 and 26, but I don't plan to have [her][him] vaccinated. Barriers to vaccination were explored in the same manner: "What are the reasons you would not want your [daughter][son] to be vaccinated?" Responses included: "I don't have a 9 to 26 year old [daughter][son];" "[She][He] is not at risk;" "[She][He] is too young;" "I worry [she][he] will become promiscuous;" "The vaccine is too expensive;" "The vaccine is too new and I am concerned about side effects."

Univariable comparisons were performed using chi square tests or Fisher's exact test as appropriate. Bivariate logistic regression was used to identify correlates of intent to vaccinate daughters and sons separately. Analyses were performed using STATA 11 (Stata Corporation, College Station, TX). All procedures were approved by the institutional review board of the University of Texas Medical Branch.

Results

Of the 1726 women surveyed, 1410 responded to the HPV-related questions. Among them, 322 (18.7%) had a son (n=121) or daughter (n=95) between 9 and 26 years of age or both (n=106). Twenty one percent were white, 46% black, and 33% Hispanic. The mean age was 32.4 ±4.3 years. Most participants were ever married or living together (69%), had an annual income <\$15,000 (57%), and did not attend college (60%).

Overall, 70.5% (227/322) had heard about HPV or cervical cancer while 76 (23.8%) had consulted their provider. Over half (176/322) had been or planned to be vaccinated themselves. Gender differences were observed with 70.5% agreeing they intended to or had vaccinated their daughter (n=95) as compared to 43.8% with a son (n=121) ($P<.001$). A similar scenario was observed for mothers (n=106) with both daughters and sons (67% vs. 39%, $P<.001$). Moreover, mothers who had been vaccinated (or planned to) were more likely to show willingness to vaccinate their daughter and son (Table 1). Healthcare provider consultation about HPV vaccine, however, was not associated with willingness to vaccinate daughters or sons. Race, education, income, number of pregnancies, religiosity, number of sexual partners, prior abnormal Pap smears, and age at first sexual intercourse also were not related to intent to vaccinate daughters or sons.

Gender differences were also observed for reasons they did not intend to vaccinate their child (Table 2). More mothers of sons stated that their child was not at risk than those with a daughter while concerns about side effects were more pronounced among mothers of daughters. However, mothers who had both daughters and sons had similar attitudes towards them.

Discussion

Our findings are in contrast to two prior US studies.^{6,7} Watts et al did not observe differences in intent to vaccinate sons vs. daughters among 246 women 18–26 years of age.⁷ Comparison of the two studies is difficult, however, as few of their participants had a child old enough to be vaccinated. The only other study to examine the intent of US mothers to vaccinate their sons and daughters was conducted at our institution in 2004. At that time, 67% of mothers with daughters and 66% of mothers with sons reported they would consent to vaccination.⁶ The current study found similar results for mothers of daughters (71%), but much lower rates for sons (44%). In both previous studies, mothers of sons were more likely to express their intent to vaccinate when they did not have to make this decision yet (child too young or vaccine not approved for boys). Now that the vaccine is available for boys, it appears that support has diminished. For example, one post-licensure study showed that the percentage of parents who intend to vaccinate their sons has now dropped to 47%.⁸

Furthermore, we observed that a barrier to vaccinating sons was the belief they are not at risk. Since most of the publicity about this vaccine has focused on cervical cancer prevention, mothers may not feel that it offers their sons any protection. However, this vaccine also protects against warts, penile cancer and anal cancer. It is possible that as this information is disseminated, mothers will understand the advantages of vaccinating their sons.

More than one-third of women who showed a negative attitude toward the vaccine thought their child was too young to receive it, even though they were 9 years of age. This scenario suggests that information on the appropriate scheduling of this vaccine has not yet reached this low income group. Fear about side effects also appears to be an important barrier, suggesting that educational interventions are needed to assure women of its safety.

This study has several limitations. The survey was not designed to investigate HPV acceptability, but rather was nested in a questionnaire examining lifestyle behaviors. Thus, only a few correlates could be examined. Furthermore, it was limited to a convenience sample of low income women seeking reproductive health care and may not be generalizable to other populations.

Overall, we found that the majority of low income women do not intend to vaccinate their sons against HPV. This is consistent with the recent report that only 2% of US males 11–17 years of age initiated the HPV vaccine in 2010.⁹ HPV-associated diseases will be greatly reduced only after successful uptake of this vaccine by both males and females.¹⁰ Thus, interventions targeting mothers are needed to increase its uptake among both genders. Social marketing efforts by the pharmaceutical company, professional organizations, and the Centers for Disease Prevention and Control should include visual information featuring mothers, girls, and boys, rather than only mothers-girls or girls only. Currently, most of the patient education material from these sources focuses on genital warts (mentioned for both sexes) and cervical cancer. Photos or graphics most often portray only females. Brochures and posters for the lay public, as well as physician education, should also include discussion of HPV in relation to anal, oropharyngeal, and penile cancers. Innovative interventions that promote initiation and completion of the vaccine series should be targeted inclusively to mothers, sons, and daughters.

Acknowledgments

Federal support for this study (K24 HD04365, Berenson) was provided by the Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NICHD or the National Institutes of Health. The sponsor had no role in the design and conduct of the study; the collection, management, analysis, and interpretation of the data; or the preparation, review, and approval of the manuscript.

References

1. Dunne EF, Unger ER, Sternberg M, et al. Prevalence of HPV infection among females in the United States. *JAMA*. 2007; 297:813–819. [PubMed: 17327523]
2. Dunne EF, Nielson CM, Stone KM, et al. Prevalence of HPV infection among men: A systematic review of the literature. *J Infect Dis*. 2006; 194:1044–1057. [PubMed: 16991079]
3. Walboomers JM, Jacobs MV, Manos MM, et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *J Pathol*. 1999; 189:12–19. [PubMed: 10451482]
4. Bosch FX, de Sanjose SS. Human papillomavirus and cervical cancer - burden and assessment of causality. *J Natl Cancer Inst Monogr*. 2003; 31:3–13. [PubMed: 12807939]
5. Greer CE, Wheeler CM, Ladner MB, et al. Human papillomavirus (HPV) type distribution and serological response to HPV type 6 virus-like particles in patients with genital warts. *J Clin Microbiol*. 1995; 33:2058–2063. [PubMed: 7559948]
6. Slomovitz BM, Sun CC, Frumovitz M, et al. Are women ready for the HPV vaccine? *Gynecol Oncol*. 2006; 103:151–154. [PubMed: 16551476]
7. Watts LA, Joseph N, Wallace M, et al. HPV vaccine: A comparison of attitudes and behavioral perspectives between Latino and non-Latino women. *Gynecol Oncol*. 2009; 112:577–582. [PubMed: 19150120]

8. Reiter PL, McRee AL, Gottlieb SL, et al. HPV vaccine for adolescent males: acceptability to parents post-vaccine licensure. *Vaccine*. 2010; 28:6292–6297. [PubMed: 20637770]
9. Reiter PL, McRee AL, Kadis JA, et al. HPV vaccine and adolescent males. *Vaccine*. 2011; 29:5595–5602. [PubMed: 21704104]
10. Elbasha EH, Dasbach EJ. Impact of vaccinating boys and men against HPV in the United States. *Vaccine*. 2010; 28:6858–6867. [PubMed: 20713101]

Table 1

Correlates of intention to vaccinate children among women with 9–26 year old daughter and son

	Women with daughter OR (95% CI) (n=95)	Women with son OR (95%CI) (n=121)
Age	0.98 (0.90–1.07)	0.96 (0.90–1.03)
Race		
White	Reference	Reference
Black	0.69 (0.28–1.75)	0.99 (0.44–2.22)
Hispanic	0.76 (0.26–2.21)	0.86 (0.35–2.07)
Education		
High school	Reference	Reference
At least some college	1.22 (0.57–2.61)	1.23 (0.64–2.36)
Income		
< \$15,000	Reference	Reference
\$15,000–\$29,999	2.19 (0.89–5.39)	1.43 (0.70–2.92)
\$30,000	1.26 (0.40–3.92)	1.41 (0.54–3.69)
Had vaccination (or planned to)	2.7 (1.1–6.8)	2.5 (1.2–5.5)
Consulted with provider	3.0 (0.9–9.7)	2.4 (0.9–6.1)

OR=Odds ratio; CI=Confidence intervals

Based on bivariate logistic regression analysis

Dependent variable: Intention to vaccinate daughter(s) or son(s)

Independent variables: age (continuous), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic), education (high school vs. at least some college), income (< \$15,000, \$15,000–\$29,999, \$30,000), had vaccination (or planned to) (no vs. yes), and consulted with provider (no vs. yes).

Table 2

Reasons not to vaccinate daughter(s) or son(s)

	Separate family			Same Family		
	Women with daughter(s) (n=61)*	Women with son(s) (n=100)*	P value	Women with daughter(s) (n=74)*	Women with son(s) (n=81)*	P value
Not at risk	11.5	27.0	.028	18.9	21.0	.545
Too young	37.7	33.0	.543	36.5	32.1	.565
Too expensive	1.6	7.0	.261	4.1	6.2	.722
Worry for promiscuousness	3.3	6.0	.711	2.7	1.2	.606
Vaccine is too new and concerned about side effects	54.1	33.0	.008	41.9	40.7	.884

* Based on the number of women responded to the questions