

Understanding HPV Vaccine Uptake Among Cambodian American Girls

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Published online: 16 February 2014
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Abstract Cervical cancer incidence rates vary substantially among racial/ethnic groups in the United States (US) with women of Southeast Asian descent having the highest rates. Up to 70 % of cervical cancers could be prevented by widespread use of the human papillomavirus (HPV) vaccine. However, there is a lack of information about HPV vaccine uptake among Southeast Asian girls in the US. We conducted a telephone survey of Cambodian women with daughters who were age-eligible for HPV vaccination. Survey items addressed HPV vaccination barriers, facilitators and uptake. Our study group included 86 Cambodian mothers who lived in the Seattle metropolitan area. The proportions of survey participants who reported their daughter had initiated and completed the HPV vaccine series were only 29 and 14 %, respectively. Higher levels of vaccine uptake were significantly associated with mothers having heard about the HPV vaccine from a health professional and having received a recent Pap test. Commonly cited barriers to HPV vaccination included lack of

knowledge about the HPV vaccine, not having received a physician recommendation for HPV vaccination and thinking the HPV vaccine is unnecessary in the absence of health problems. Linguistically and culturally appropriate HPV educational programs should be developed and implemented in Cambodian American communities. These programs should aim to enhance understanding of disease prevention measures, increase knowledge about the HPV vaccine and empower women to ask their daughter's doctors for HPV vaccination.

Keywords Cambodian American · HPV · Vaccination

Introduction

Virtually all cases of cervical cancer are caused by human papillomavirus (HPV) infection [1]. Two HPV vaccines (Gardasil and Cervarix) that protect against HPV types 16 and 18 have recently been approved for use in the United States (US) [2, 3]. It is estimated that widespread use of these vaccines could prevent up to 70 % of cervical cancers. Current guidelines include routine HPV vaccination for girls ages 11–12, catch-up vaccination for girls and women ages 13–26 who have not yet been vaccinated, and vaccine use at a health care provider's discretion for girls ages 9–10. These recommendations were designed to encourage vaccination before the onset of sexual activity. The recommended HPV vaccination schedule is three doses administered over a 6 month period [3].

Cervical cancer incidence rates vary substantially among racial/ethnic groups in the US with women of Southeast Asian descent having the highest rates [4, 5]. The incidence rate among Cambodian women is twice the incidence rate among non-Hispanic white women (15.0 vs.

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7.7 per 100,000) [6]. It is important to characterize HPV vaccine uptake in populations that experience cervical cancer disparities because they stand to benefit the most from widespread HPV vaccine coverage. However, very few studies have focused on HPV vaccination among Americans of Southeast Asian descent [7].

Parental consent is generally required for any medical intervention given to individuals younger than 18 years. Therefore, population-level HPV vaccination levels will be largely determined by parental acceptance of the vaccine [8]. Mothers are particularly important to HPV vaccine research because they usually have primary responsibility for their children's health care, and are more likely to know their children's vaccination history than fathers [9]. We conducted a pilot study addressing HPV vaccination barriers, facilitators and uptake among Cambodian mothers of adolescent girls in Washington State. Our goal was to provide information that could be used to develop educational materials and intervention programs to promote HPV vaccination in Cambodian American communities.

Methods

Study Overview

Our survey was conducted in the Seattle metropolitan area. This area is home to the third largest Cambodian community in the US [10]. Our survey participants were Cambodian mothers with daughters in the 9–17 age group. The survey was administered by telephone over a nine-month period during 2012 and 2013. Our three survey interviewers were all bilingual Cambodian women. Participants completed their surveys in Khmer or English and were offered \$20 as a token of appreciation for their time. Study materials were translated from English into Khmer using standard forward- and back-translation methods. The Fred Hutchinson Cancer Research Center Institutional Review Board approved our study procedures. An advisory group of Cambodian community leaders provided guidance regarding participant recruitment, survey procedures and the survey instrument.

Study Participants

Potential survey participants were identified for this pilot project in several ways. First, we attempted to contact households with common Cambodian last names that were listed in the local phone book and identify households that included a Cambodian mother with a daughter in the target age group. Thirty-one eligible households were reached using this approach and 22 (71 %) of these households agreed to participate in the survey. Second, representatives

from community-based organizations that serve Cambodian immigrants, Cambodian coalition members and other Cambodian community leaders and individuals who provide programs for Cambodian youth referred eligible mothers to the project. Of the 69 referred mothers, 64 (93 %) agreed to participate. Our study had a total sample size of 86.

Survey Instrument

Our survey instrument development was guided by earlier qualitative research addressing HPV vaccination in the Cambodian community, a previous Los Angeles survey of ethnic minority mothers of adolescent girls and the Health Behavior Framework [11–13]. Survey sections addressed mother's and daughter's demographic characteristics, health care factors, disease prevention behaviors, knowledge and beliefs about the HPV vaccine, sources of information about the HPV vaccine and HPV vaccine uptake.

Women who had two or more daughters ages 9–17 were asked to think about their daughter who most recently had a birthday as they responded to questions about their daughter. Before answering any questions about the HPV vaccine, women were read the following statement: "HPV is a common sexually transmitted virus that can cause cervical cancer and genital warts in women. A vaccine to prevent HPV infection is available for girls and young women ages 9–26. It is sometimes called the HPV vaccine, the human papillomavirus vaccine, the cervical cancer vaccine, Gardasil and Cervarix."

Survey participants provided information about their own demographic characteristics (age, educational level, marital status, birthplace, age at immigration and English-language proficiency) as well as their daughter's demographic characteristics (age and birthplace). Additionally, each participant specified whether or not she had personally received a Pap test in the previous 3 years and whether or not her daughter had health insurance coverage, had a regular source of health care and had received a routine physical in the previous 12 months.

Respondents indicated whether they thought the HPV vaccine should be given before a girl starts having sex, is effective, is safe, has side effects and could cause problems getting pregnant later in life. They also indicated whether they had heard about the HPV vaccine from the following information sources: doctor, nurse or other health professional; family member or friend; Khmer language newspaper or magazine; English language newspaper or magazine; Khmer language website; English language website; and TV program or commercial.

Mothers were asked whether their daughter had ever received the HPV vaccine and, if so, how many HPV

vaccine shots she had received. If their daughter had ever received the HPV vaccine, mothers were asked to specify their main reason for getting the vaccine. Similarly, if their daughter had never received the HPV vaccine, mothers were asked to specify their main reason for not getting the vaccine.

Data Analysis

Fisher's exact test was used to examine bi-variable relationships between study group characteristics and HPV vaccine initiation (having received at least one dose of the HPV vaccine). Taking the variables with a p value of <0.20 in our bi-variable analysis as a potential pool of variables, we conducted a logistic regression analysis with stepwise selection to build a summary model. Two members of the research group independently coded responses to our open-ended questions about mother's reasons for getting and not getting their daughter vaccinated against HPV and then met to discuss and resolve coding discrepancies.

Results

Participant Characteristics

Eighty-three percent of the survey respondents chose to complete their survey in Khmer (rather than English). As shown in Table 1, nearly all the respondents were foreign-born. Over one-half of the mothers had less than 12 years of education and limited English proficiency. Few of the daughters lacked health insurance coverage or a regular source of care. Four-fifths of the mothers had received a Pap test in the last 3 years and about three-quarters of the daughters had received a routine physical exam in the previous 12 months. A majority of respondents knew that the HPV vaccine should be given before a girl starts having sex, and thought it is effective and safe. Less than one-third had heard about the HPV vaccine from any of the information sources considered in this study.

HPV Vaccine Uptake

Only 29 % of the mothers reported their daughter had initiated the HPV vaccination series (received at least one dose of the HPV vaccine) and only 14 % reported their daughter had completed the HPV vaccination series (received all three doses of the HPV vaccine). The proportions of mothers with daughters in the 9–12 and 13–17 age groups who reported HPV initiation were 16 and 33 %, respectively (Table 1).

Factors Associated with HPV Vaccine Initiation

Table 1 gives information about factors associated with initiation of the HPV vaccine series in our bi-variable analysis. Initiation was significantly associated with having heard about the HPV vaccine from three sources: a doctor, nurse or other health professional; English newspapers or magazines; and English websites ($p < 0.05$). It was also significantly associated with mothers having received a Pap test in the previous 3 years ($p = 0.002$). The associations between initiation and the following variables were marginally significant ($p \leq 0.10$): higher educational level, younger age at immigration, English proficiency, daughters having received a routine physical in the previous 12 months, and having heard about the HPV vaccine from a television program or commercial. None of the knowledge and belief variables were significantly associated with HPV vaccine initiation. Two variables remained statistically significant in the multi-variable logistic regression analysis: mother had received a Pap test in the previous 3 years ($p = 0.006$) and mother had heard of HPV vaccine from a doctor, nurse or other health professional ($p = 0.007$).

Reasons for Getting and not Getting the HPV Vaccine

Table 2 provides summary information about mother's main reasons for getting and not getting their daughters vaccinated against HPV, as well as examples of their responses. When asked why their daughter had received the HPV vaccine, 24 of the 25 mothers of vaccinated girls provided a specific reason for getting their daughters vaccinated. Most of these mothers indicated they wanted to protect their daughter from disease or had received a physician recommendation for HPV vaccination. When asked why their daughter had not received the HPV vaccine, 49 of the 61 mothers of unvaccinated girls provided a specific reason for not getting their daughter vaccinated. Commonly cited reasons included lack of knowledge about the HPV vaccine, not having received a physician recommendation for HPV vaccination and thinking the HPV vaccine was unnecessary because their daughters did not have health problems.

Discussion

Healthy People 2020 set a HPV vaccine completion goal of 80 % for adolescent girls ages 13–15 [14]. To date, HPV vaccination uptake among adolescent girls has been disappointing and does not even approach the Healthy People 2020 goal. According to 2012 US data, 54 % of girls in the 13–17 age group have initiated HPV vaccination (received

Table 1 Participant characteristics and HPV vaccination uptake (N = 86)

Variable	All respondents n (%)	Initiated vaccination (%)	p value
Mother's demographic characteristics			
Age (years)			
<45	37 (44)	32	0.64
≥45	48 (56)	27	
Years of formal education			
<12	50 (58)	22	0.10
≥12	36 (42)	39	
Currently married			
Yes	53 (62)	30	0.99
No	32 (38)	28	
Birthplace			
Cambodia ^a	82 (96)	27	0.19
US	3 (4)	67	
Age at immigration (years)			
<20 ^b	34 (40)	41	0.09
≥20	51 (60)	22	
Limited English proficiency			
Yes ^c	44 (51)	20	0.10
No	42 (49)	38	
Daughter's demographic characteristics			
Age (years)			
9–12	19 (22)	16	0.25
13–17	67 (78)	33	
Birthplace			
Cambodia	9 (10)	22	0.99
US	77 (90)	30	
Health care factors			
Health insurance coverage			
Yes	81 (95)	30	0.99
No	4 (5)	25	
Regular source of health care			
Yes	82 (95)	30	0.32
No	4 (5)	0	
Preventive behavior			
Mother had Pap test in previous 3 years			
Yes	69 (80)	36	0.002
No	17 (20)	0	
Daughter had routine physical in previous 12 months			
Yes	64 (74)	34	0.10
No	22 (26)	14	
Knowledge and beliefs			
HPV vaccine should be given before a girl starts having sex			
Yes	64 (74)	31	0.59
No	22 (26)	23	
HPV vaccine is effective			
Yes	71 (83)	31	0.54
No	15 (17)	20	

Table 1 continued

Variable	All respondents n (%)	Initiated vaccination (%)	p value
HPV vaccine is safe			
Yes	69 (81)	30	0.77
No	16 (19)	25	
HPV vaccine has side effects			
Yes	40 (47)	30	0.99
No	46 (53)	28	
HPV vaccine could cause problems getting pregnant later in life			
Yes	32 (37)	19	0.14
No	54 (63)	35	
Sources of information			
Doctor, nurse or other health professional			
Yes	27 (31)	56	<0.001
No	59 (69)	17	
Family member or friend			
Yes	18 (21)	33	0.77
No	68 (79)	28	
Khmer newspaper or magazine			
Yes	9 (10)	33	0.72
No	77 (90)	29	
English newspaper or magazine			
Yes	19 (22)	53	0.02
No	67 (78)	22	
Khmer website			
Yes	8 (9)	50	0.22
No	78 (91)	27	
English website			
Yes	15 (17)	60	0.009
No	71 (83)	23	
Television program or commercial			
Yes	22 (26)	45	0.06
No	64 (74)	23	

^a Includes 2 mothers who were born in Thailand and 1 mother who was born in Vietnam

^b Includes 3 mothers who were born in the US

^c Spoke English poorly or not at all

at least one dose of the vaccine), and 33 % have completed HPV vaccination (received all three doses of the vaccine) [15]. We found that only one-third (33 %) of Cambodian girls ages 13–17 have initiated the HPV vaccine series and only a very small proportion (14 %) have completed it.

Foreign-born parents in California are significantly less likely to report their adolescent daughters have initiated the HPV vaccine series than are US-born parents [16]. Nearly all our participants were foreign-born. However, women who came to the US as children or teenagers (<20 years of age) were marginally more likely to report HPV vaccine

Table 2 Main reasons for getting and not getting HPV vaccination

Category of reasons	n (%)	Response examples
Reasons for getting the vaccine (N = 24) ^a		
Wanted to protect daughter from disease	13 (54)	For health protection To prevent HPV virus in the future To prevent her from getting cervical cancer in life
Received a physician recommendation for HPV vaccination	10 (42)	It was recommended by her doctor My doctor said she needs to get this vaccine
Other	1 (4)	Her school recommended it
Reasons for not getting the vaccine (N = 49) ^b		
Lack of knowledge about the HPV vaccine	21 (43)	I did not know there is a vaccine for HPV virus I do not know what HPV vaccination is for
Had not received a physician recommendation for HPV vaccination	12 (24)	I have not heard about it from her doctor yet Her doctor said she is not old enough to get the vaccine
Thought HPV vaccination was unnecessary because daughter did not have HPV/any health problems	9 (18)	She does not have any problem with her health She has no sickness She does not have HPV
Thought HPV vaccination was unnecessary because daughter was too young/not sexually active	4 (8)	She does not have any boyfriend She is still young and not sexually active yet
Concerns about the HPV vaccine	2 (4)	I do not really trust the vaccination We do not know the safety of it yet
Other	1 (2)	My husband said she does not need it

^a Mothers who had initiated HPV vaccination, and provided a specific reason for getting their daughter vaccinated

^b Mothers who had not initiated HPV vaccination, and provided a specific reason for not getting their daughter vaccinated

initiation than those who came to the US as adults (≥ 20 years of age) ($p = 0.09$); and participants who were proficient in English were marginally more likely to report HPV vaccine initiation than those with limited English proficiency ($p = 0.10$).

We have previously found that Cambodian immigrants often have a limited understanding of western concepts of disease prevention and preventive measures [13, 17]. One in five (18 %) of the mothers with unvaccinated daughters indicated they thought HPV vaccination was unnecessary in the absence of HPV or other health problems. Additionally, none of the girls with mothers who were non-adherent to Pap testing guidelines had initiated HPV vaccination, and there was a strong association between mother's Pap testing history and daughter's HPV vaccination history ($p = 0.002$). Significant associations between Pap testing use, HPV awareness and HPV vaccine uptake have previously been documented among Asian American women [18, 19].

Limited access to health information is one potential explanation for cancer-related disparities experienced by racial/ethnic minority groups [20]. Lack of knowledge about the HPV vaccine was the most commonly cited reason for not getting the vaccine among mothers of unvaccinated girls (cited by 43 %). Further, the proportions of mothers who reported they had heard of the HPV

vaccine through English language newspapers or magazines, English language websites, and television programs or commercials were only 22, 17 and 26 %, respectively. A 2007 North Carolina survey found that far higher proportions of White and Black parents had heard of the HPV vaccine through media sources [21].

Yi et al. [7] have recently reported that 86 % of Vietnamese mothers would get their daughters vaccinated against HPV if a medical provider recommended it. We found a strong association ($p < 0.001$) between having heard about the HPV vaccine from a doctor, nurse or other health care provider and HPV vaccine initiation. Additionally, about two-fifths (42 %) of the Cambodian mothers who reported getting their daughter vaccinated cited a physician recommendation as their main reason for doing so, and about one-quarter (24 %) of the mothers who reported their daughter had not received the HPV vaccine cited lack of a physician recommendation as their main reason for not doing so.

The Centers for Disease Control and Prevention has documented that missed opportunities to vaccinate girls against HPV during preventive health care encounters contribute to low levels of HPV vaccine uptake [22]. An overwhelming majority (95 %) of our survey participants reported their daughter had a regular source of care and nearly three-quarters (74 %) reported their daughter had

received a routine physical in the previous 12 months. However, only 31 % of our participants reported that they had heard about the HPV vaccine from a doctor, nurse or other health care provider.

This study has several limitations that should be noted. Our survey was conducted in one geographic area of the US, we used convenience-based sampling methods, and we did not attempt to verify vaccination self-reports with health care provider reports. Additionally, the sample size for this pilot study addressing HPV vaccine barriers, facilitators, and uptake was relatively modest.

In conclusion, HPV vaccine uptake among Cambodian American adolescent girls is sub-optimal. Our findings indicate that some Cambodian mother's level of understanding about prevention may be an impediment to HPV vaccine uptake, Cambodian women are less likely to receive information through media sources than are women from other racial/ethnic groups, and health care providers often miss opportunities to offer and provide HPV vaccination to Cambodian girls. Linguistically and culturally appropriate HPV educational programs should be developed and implemented in Cambodian American communities. These programs should aim to enhance understanding of preventive measures, increase knowledge about the HPV vaccine, and empower women to ask their daughter's doctors for HPV vaccination.

Acknowledgments This research was supported by Grant CA159908 from the National Cancer Institute. We thank the Cambodian community leaders who participate in our advisory group for their assistance and advice, as well as the survey interviewers for their outstanding work.

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