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Purnima Madhivanan
Florida International University

Vijaya Srinivas
Public Health Research Institute of India

Laura Marlow
University College London

Soumyadeep Mukherjee
Rhode Island College, smukherjee@ric.edu

Doddaiah Narayanappa
JSS Medical College & Research Institute

See next page for additional authors

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Authors

Purnima Madhivanan, Vijaya Srinivas, Laura Marlow, Soumyadeep Mukherjee, Doddaiah Narayanappa, Shekar Mysore, Anjali Arun, and Karl Krupp

RESEARCH ARTICLE

Indian Parents Prefer Vaccinating their Daughters against HPV at Older Ages

Purnima Madhivanan^{1,2*}, Vijaya Srinivas², Laura Marlow³, Soumyadeep Mukherjee¹, Doddaiiah Narayanappa⁴, Shekar Mysore⁵, Anjali Arun², Karl Krupp^{1,2}

Abstract

Background: Increasing uptake of human papillomavirus (HPV) vaccine should be a priority in developing countries since they suffer 88% of the world's cervical cancer burden. In many countries studies show that age at vaccination is an important determinate of parental acceptability. This study explores parental preferences on age-to-vaccinate for adolescent school-going girls. **Materials and Methods:** The sample was selected using a two-stage probability proportional to size cluster sampling methodology. Questionnaires were sent home with a random sample of 800 adolescent girls attending 12 schools in Mysore to be completed by parents. Descriptive statistics including frequencies, percentages and proportions were generated for independent variables and bivariate analyses (Chi square test) were used to assess the relationship between independent and appropriate age-to-vaccinate. **Results:** HPV vaccination acceptability was high at 71%. While 5.3% of parents felt girls should be vaccinated by 10 years or younger; 38.3% said 11-15 years; 14.8% said 16-18 years; 5.8% suggested over 19 years; and 33% didn't know. Only 2.8% of parents would not vaccinate their daughters. **Conclusions:** Delaying HPV vaccination until later ages may significantly increase uptake of the HPV vaccine in India.

Keywords: Age - girls - human papillomavirus - immunization - vaccine - India

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Introduction

Cervical cancer is a major cause of death among women in developing countries where it accounts for about 13% of all female cancers (Globocan, 2008). The disease has largely been eliminated in high income countries with prophylactic immunization and secondary prevention (Gakidou et al., 2008; Demarteau et al., 2012). Introduction of the HPV vaccine has proceeded slowly in many countries because of low knowledge about cervical cancer, high vaccine cost, and cultural preferences surrounding vaccinating young girls (Tsui et al., 2009). HPV types 16 and/or 18, against which the vaccines are most effective (CDC, 2012), have been found to be present in 74% to nearly 90% of cervical cancer patients in India. (Basu et al., 2009; Das, 2013). Estimates suggest that prophylactic HPV vaccination can reduce the burden of cervical cancer in India by more than 75% (Basu et al., 2009). According to the results of a cost-effectiveness analysis, 70% coverage of pre-adolescent girls (girls below

age 12) with the HPV vaccine can potentially reduce the lifetime risk of cervical cancer by 44%; and is more effective than screening alone. Screening three times in a lifetime reduces cervical cancer risk by 21-33% (Diaz et al., 2008). Despite these facts, little research on vaccine acceptability has been carried out in India, a country with one of the highest incidence of cervical cancer in the world.

Studies have shown that age-at-vaccination is an important factor in parental decision-making about immunizing daughter against HPV infection (Marlow et al., 2007). A qualitative study carried out in the same population suggested that many parents preferred vaccinating girls against HPV after puberty. Most felt that younger girls were unlikely to be sexually active and therefore should not receive an HPV vaccination until they were adolescents or young adults (Madhivanan et al., 2009). This manuscript describes a quantitative survey among parents of school going girls in urban Mysore about the most appropriate age at HPV vaccination.

¹Robert Stempel College of Public Health and Social Work, Florida International University, Miami, USA, ³Health Behavior Research Centre, Department of Epidemiology and Public Health, UCL, London, ²Public Health Research Institute of India, ⁴Department of Pediatrics, JSS Medical College & Research Institute, ⁵Department of Internal Medicine, Mysore Medical College & Research Institute, Mysore, India *For correspondence: pmadhiva@fiu.edu

Materials and Methods

Between February and December 2010, a questionnaire survey was conducted among parents in a cluster of 12 schools Mysore City, India. Participants were included if they had an adolescent school-going daughter (ages 11-15) in target schools; were able to read and understand English or *Kannada*, the local language; and could give informed consent.

A program announcement was sent home with all girls attending 7th through 10th grades explaining the study and inviting eligible parents to participate. Then we enumerated all schoolgirls in the target age group and randomly selected 800 female students to take surveys home. The questionnaire that it should be completed by one parent per household and returned within seven days. The study was approved by the Institutional Review Committee of Public Health Research Institute of India and Florida International University.

Data were analyzed using Stata 10.1 (Stata Corporation, College Station, TX) and SAS statistical software package, version 9.3 (SAS Institute Inc., Cary, North Carolina). Issues related to cluster sampling was adjusted by using

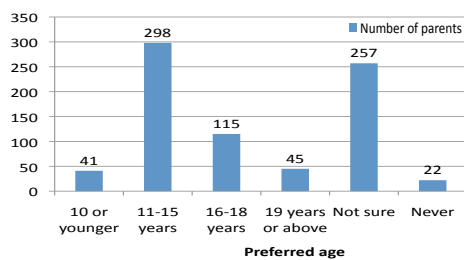


Figure 1. Distribution of Parents (N=778) According to the Age at which they Prefer Girls should Receive HPV Vaccine

Table 1. Relationship of Demographic Characteristics Associated with Parents' Preferred age at HPV Vaccination of Children (N =778) in Mysore City, India

Characteristic	Preferred age of vaccination (n= 778)			Total (%) ^d	Chi-Square p value
	15 or less (%) ^a	Above 15 (%) ^b	Not sure (%) ^c		
Age group (years)	≤35	102 (42.2)	46 (19.0)	94 (38.8)	0.52
	36-40	126 (49.0)	47 (18.3)	84 (34.71)	
	41-50	65 (41.4)	34 (21.7)	58 (36.9)	
	51-60	46 (37.7)	33 (27.0)	43 (35.2)	
Education level	None	53 (45.7)	24 (20.7)	39 (33.6)	0.41
	1 to10 th grade	167 (42.4)	80 (20.3)	147 (37.3)	
	High School & Bachelor degree	88 (46.6)	35 (18.5)	66 (34.9)	
	Master degree or above	15 (38.5)	13 (33.3)	11 (28.2)	
	Vocational Training (Diploma)	16 (40.0)	8 (20.0)	16 (40.0)	
Employment Status	Employed full time	91 (42.5)	47 (22.0)	76 (35.5)	0.82
	Employed part-time	36 (43.4)	18 (21.7)	29 (34.9)	
	Self-employed	52 (46.4)	19 (17.0)	41 (36.6)	
	Full time home maker	147 (43.4)	73 (21.5)	119 (35.1)	
	Retired/Unemployed	13 (43.3)	3 (10.0)	14 (46.7)	
Marital Status	Married	321 (43.6)	150 (20.4)	266 (36.1)	0.81
	Divorced/Separated/widowed	18(43.9)	10 (24.4)	13 (31.7)	
Religion	Hindus	249 (41.0)	130 (21.4)	228 (37.6)	0.0009*
	Muslim	74 (50.7)	27 (18.5)	45 (30.8)	
	Christians/ others	16(64.0)	3(12.0)	6(24.0)	

*statistically significant, ^aproportion of the parents within each category who prefer that age at HPV vaccination should be 15 years or less, ^bproportion of the parents within each category who prefer that age at HPV vaccination should be above 15 years, ^cproportion of the parents within each category, who are not sure of an appropriate age for HPV vaccination, ^dpercentage out of the total (N=778)

“proc surveyfreq” procedures. Descriptive statistics were conducted for all variables. Bivariate associations between preferred ‘age-of-vaccination’ and explanatory variables were assessed using chi-squared tests. Tests of significance were 2-tailed (p<0.05).

Results

Of the 797 returned surveys, 19 were excluded from analyses because they were returned without a signed consent form. 298 parents (about 38.3%) preferred vaccinating their daughters between 11-15 years; 5.3%, 10 years or younger; 20.6% favored late vaccination (16 years or older) and 33% were unsure when to vaccinate (Figure 1).

Of the 43.6% of parents who thought the appropriate age to vaccinate was less than 15 years, 81% were likely to accept HPV vaccination for their daughter as compared to 70% of those who thought the appropriate age to vaccinate was over 15 years of age. Interestingly, of the 35.9% of respondents who were unsure of appropriate age-to-vaccinate, 60.6% also found HPV vaccination acceptable.

Table 1 describes the relationship of the demographic characteristics of the respondents with their preferred age of vaccination of girls with HPV vaccine. About 41% of Hindus, 51% Muslims and 64% of parents of other religions said they would consider early vaccination for their daughters (p=0.0009). There was no association with age-at-vaccination and other demographic characteristics of respondents.

Age to discuss HPV and cancer with daughters

Parents were asked the most appropriate age when they would discuss cancer with their daughters and cervical cancer specifically. While 10% of parents were willing

to discuss cancer in general with younger daughters (≥ 10 years); 25% of the parents were willing to discuss with daughters aged 11-14 years; and 35% between 15-18 years. About 29% reported that girls should be over 18 years before cancer is discussed. In contrast, only 3% were willing to discuss cervical cancer specifically with their younger age daughters. About one in five would discuss it with 11-14 year olds, and 34% felt it was only appropriate for 15-18 year olds. Over 40% of the parents preferred discussing cervical cancer only if daughters were over 19 years of age.

When asked if parents would discuss sex in general and sexually transmitted infections specifically, more than half of the sample (60%) preferred waiting until their daughter was 19 years or older. About a third (30.1%) of participants reported they would consider talking to their child when she is 15-18 years of age.

Parents were asked about the appropriate time for discussing vaccinations in general, and HPV vaccination in particular, with their daughter. About one in five (20%) and one in 10 respectively were willing to discuss vaccinations in general and HPV vaccination with their younger age daughters. Less than one third of parents (27%) and 29% respectively, said they would talk to their 11-14 years about vaccination in general and HPV vaccination specifically. About 33% and 38% said they would talk to their 15-18 years about vaccinations in general and HPV vaccination in particular, respectively. Finally, 19% and 21% said they would only discuss vaccinations in general and HPV vaccine in particular with a daughter over age 19.

Information about vaccinations

Most parents (85%) reported television as their main way of getting information about vaccines; 79% said newspaper or radio; and 43%, the internet. In addition, 86% of the parents reported doctors as their main source of information about vaccines; 60%, friends or neighbors; and 54%, other healthcare workers. A vast majority (82%) reported getting information from their daughter's school on vaccinations, and 63% said they relied on family members or relatives for this information.

Discussion

This study is one of the first to examine parental preferences about age of vaccination for HPV infection in southern India. The data shows that majority of parents felt that daughters should be vaccinated at older ages (11-15). While 35% of respondents also felt that cancer and cervical cancer should not be discussed with a child until they are older (15-19 years). Finally, many parents receive their vaccine information from television (84.5%), or a family physician (86%).

The preference for vaccinating older children should not be overlooked in planning a rollout of the HPV vaccine. Since the average age at first intercourse is 22.9 years in India, immunizing at later ages is unlikely to reduce the effectiveness of the vaccine (Durex Network, 2007). Our data shows that Indian parents would be more accepting of HPV immunization if it were given at later

ages. This is similar to findings from research in other countries, where, some studies have revealed parental willingness to vaccinate an older child compared to a younger one (Dempsey et al., 2006; Zhang et al., 2013).

Results of the study also suggest the importance of educating Pediatricians and Family physicians about HPV and cervical cancer. In addition, since a large percentage of parents get their information from television (85%) and the internet (43%), the vaccine should be aggressively promoted in these mediums.

This study had several limitations. First, because it utilized a sample of only parents of school-going adolescent girls, findings may not be representative of the population as a whole. Even among parents of school-going children, certain segments of the population may not have been represented in the institutions selected for study. The study also has important strengths including a high response rate, minimal missing data and a randomly selected study population. In conclusion, our study found Indian parents would be more accepting of HPV immunization if it were given at later ages. More studies are needed to examine parental acceptability and preferred age-to-vaccinate in different populations in India.

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