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Vaccinating adolescent girls against human papillomavirus—Who decides?

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Human papillomavirus (HPV) vaccination holds exceptional promise for preventing genital warts, cervical cancer and other HPV-related cancers (Markowitz et al., 2007). Most research on HPV vaccine acceptability has focused on parents (Brewer and Fazekas, 2007), potentially overlooking an important role that adolescents may have in making these vaccination decisions. While parents are likely to be the primary decision makers about their child's healthcare, many individuals begin contributing to these decisions during adolescence (Dickey and Deatrick, 2000). Research conducted prior to availability of HPV vaccine suggests that many parents believe vaccination decisions should be made jointly between parents and their children (Brabin et al., 2006) making it plausible that adolescents are more central to HPV vaccination decisions than presently recognized. To address this question, we briefly characterize parent perceptions of adolescent involvement in decisions about whether they will get vaccinated against HPV.

We describe the study design briefly here and in detail elsewhere (Hughes et al., 2009, Ziarnowski et al., 2009). At baseline, we contacted a probability sample of households in areas of North Carolina with elevated cervical cancer rates, over-sampling households likely to include a female child aged 10 to 18, African Americans, and rural telephone exchanges. Trained personnel used computer-assisted telephone interviewing equipment to conduct interviews. Data for our paper came from follow-up interviews with caregivers of adolescent

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Conflict of interest statement

Dr. Brewer, the study PI, received a research grant in 2008–2009 from Merck for a study of men's attitudes toward HPV vaccination. He has received no honoraria or consulting fees from Merck or GlaxoSmithKline. No funds from GlaxoSmithKline or Merck funded these research activities.

girls, by then aged 11–20. Since the vast majority of caregivers interviewed (97%) reported being the child's parent, hereafter, we refer to all participants as parents.

Of 1220 eligible parents contacted, 889 (73%) completed baseline interviews between July and October 2007. Interviewers re-contacted 74% (650/873) of eligible baseline respondents by telephone during the fall of 2008. HPV vaccine decision-making data were available for 647 parents. Most parents were female (94%; Table 1), non-Hispanic White (74%) or African American (20%), married (86%), and had at least some college education (81%). The University of North Carolina Institutional Review Board approved the study.

The primary outcome was parents' report of their daughters' involvement in HPV vaccination decisions (1="none", 4="a lot"). We also assessed the primary person who decided whether to vaccinate the daughter against HPV (self, spouse, daughter, other). We collected information on HPV vaccine uptake, whether a doctor had recommended HPV vaccine, and parent's perception of their daughter's sexual activity. The survey also assessed daughter's age as well as a range of parent demographics.

We examined correlates of adolescent involvement in HPV vaccination decisions with linear regression (reporting associations as standardized regression coefficients, β 's). We examined correlates of daughters being primary decision makers as well as associations between involvement and vaccine uptake with logistic regression (reporting associations as odds ratios, ORs). We entered statistically significant bivariate predictors ($p<0.05$) into multivariate models. Analyses used Stata SE version 10.0 (Statacorp, College Station, TX).

Parents reported substantial involvement by their daughters in decisions about whether to get HPV vaccine (mean: 2.55, SD=1.21). About half (51%, 329/647) reported their daughters were involved a moderate amount or a lot in the decisions. Furthermore, while most parents reported either they or their spouses were the primary person who made HPV vaccination decisions (86%, 559/647), many parents identified their daughter as the primary decision maker (12%, 75/647).

Adolescent involvement in HPV vaccination decisions was higher among daughters aged 15–17 ($\beta=.24$) or 18–20 ($\beta=.41$) than those aged 11–14 (both $p<.001$) in multivariate analyses. Parents who believed their daughters were sexually active ($\beta=.11$, $p<.05$) or who reported receiving a doctor recommendation to get their daughters HPV vaccine ($\beta=.08$, $p<.05$) also indicated their daughters were more involved. Daughter's age was the only significant correlate of daughters being primary decision-makers. Daughters aged 15–17 (11%, OR=2.41, 95%CI: 1.16–5.02) or 18–20 (30%, OR=8.54, 95%CI: 4.30–16.97) were more likely than daughters aged 11–14 (5%) to be the primary decision-maker.

At baseline and follow-up, 12% and 35% of parents had initiated HPV vaccine for their daughters. Initiation of HPV vaccine increased with higher adolescent involvement in vaccination decisions (OR=1.18, 95%CI: 1.03–1.35) in bivariate analyses. This relationship was no longer statistically significant after controlling for covariates that were significant in bivariate models (daughter's age, perception of daughter's sexual activity, doctor's recommendation, race/ethnicity, and parental education level).

In summary, many parents reported that their daughters were involved in HPV vaccination decisions. This level of involvement is consistent with a recent finding that 48% of adolescent girls said they participated in decisions about whether or not to receive HPV vaccine (Mathur et al., 2009). The gap in our understanding of adolescents' role in decision making may hamper efforts to increase vaccine uptake. Adolescent involvement in vaccination decisions has the potential to both positively and negatively influence uptake of HPV vaccine. Our findings show that daughters are involved in decisions both to receive and to decline HPV vaccination, but the nature of their involvement is still unclear. Knowledge of how parents and their daughters jointly make HPV vaccination decisions may provide insight into ways of increasing current rates of HPV vaccination.

Doctor recommendation of HPV vaccine predicts acceptability (Brewer and Fazekas, 2007) and uptake (Reiter et al., 2009). In our study, we found it was also associated with adolescent involvement in HPV vaccination decisions, though the reason for this relationship requires further investigation. Communication about HPV vaccine between adolescents, their parents, and their healthcare providers is also an area for future research.

The main limitation of this study is that we understand adolescents' participation only from the perspective of their parents. Interviewing daughters might give us a different impression of their involvement, potentially showing a larger role. We did not explicitly ask whether parents had made a decision, leaving open the possibility that some parents had not gone through a decision-making process and may have answered about who would likely decide.

Our findings suggest that many female adolescents, even girls as young as age 11, play an important role in making decisions about HPV vaccine. While our study provides new information about the prevalence of daughters' involvement in HPV vaccination decisions, further research is needed to help us better understand the nature of their participation and their role in influencing vaccine uptake.

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Table 1

Correlates of daughter involvement in HPV vaccination decision making (North Carolina, USA, 2008).

	Total n (%)	Bivariate β	Multivariate β
Daughter's age			
11–14 years (Ref)	235 (36.3)	–	–
15–17 years	236 (36.5)	.28 **	.24 **
18–20 years	176 (27.2)	.48 **	.41 **
Parent's perception of daughter's sexual activity ^a			
Not sexually active (Ref)	327 (50.5)	–	–
May be sexually active	219 (33.9)	.20 **	.03
Sexually active	101 (15.6)	.29 **	.11 *
Doctor recommend daughter get HPV vaccine			
No (Ref)	495 (76.5)	–	–
Yes	152 (23.5)	.09 *	.08 *
Parent demographic characteristics			
Age			
<45 years (Ref)	305 (47.1)	–	–
45+ years	342 (52.9)	.15	.07
Sex			
Female (Ref)	609 (94.1)	–	
Male	38 (5.9)	.05	
Race/ethnicity			
Non-Hispanic white (Ref)	479 (74.0)	–	
Non-Hispanic black	131 (20.3)	.02	
Hispanic or other	37 (5.7)	−.00	
Education			
High school or less (Ref)	122 (18.9)	–	
Some college or more	525 (81.1)	−.03	
Marital status			
Married (Ref)	554 (85.6)	–	
Other	93 (14.4)	.00	
Annual household income			
<\$60,000 (Ref)	259 (40.0)	–	
\$60,000+	361 (55.8)	.01	
Missing	27 (4.2)	−.07	
Area of residence			
Rural (Ref)	321 (49.6)	–	
Urban	326 (50.4)	.05	

Note. Table reports standardized regression coefficients (β) from linear regression models of daughter's involvement in the decision about whether to get vaccinated against HPV [mean: 2.55, SD=1.21, range 1–4; 1="none" (28.2%), 2="a little" (20.9%), 3="a moderate amount" (18.9%), 4="a lot" (32.0%)]. Multivariate model includes all correlates significant ($p<.05$) in bivariate models. Ref=reference category, SD=standard deviation.

*
 $p < .05$,

**
 $p < .001$.

^aParent's perception of daughter's sexual activity (1=not sexually active and will not be in next year, 2=may already be sexually active or may become sexually active in next year, and 3=either currently sexually active or will become sexually active in next year).