Chapter 24: Psychosocial aspects of vaccine acceptability

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Received 6 March 2006; accepted 1 June 2006

Abstract

In this chapter we identify psychosocial issues that have been raised with respect to human papillomavirus (HPV) vaccination and review the research literature on HPV vaccine acceptability. Many women and physicians have relatively poor knowledge about HPV, but despite this, most healthcare providers are willing to recommend HPV vaccination and parents are interested in having their children vaccinated. Concerns about post-vaccination sexual behavior change do not appear to be justified, but can certainly be addressed through anticipatory guidance. Most research studies have come out of the United States and other English-speaking industrialized countries. More psychosocial research regarding HPV vaccination is therefore needed from developing countries.

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Keywords: HPV vaccines; Parental attitudes; Health personnel

1. Introduction

In this chapter we will address critical issues associated with possible acceptance or rejection of HPV vaccination. We will discuss some of the potential barriers to HPV immunization that have been mentioned in the literature and examine the extent to which existing empirical research supports, refutes, and/or adds to these hypothesized barriers. In addition, the issue of unintended consequences of HPV vaccination will be covered, specifically with reference to concerns about post-immunization sexual behavior change and decreased rates of Pap testing. Future research needs will be identified throughout, with particular attention paid to the need for more research outside of the US and Western Europe.

2. Potential obstacles to vaccination

Several reviews and commentaries have addressed potential problems that may interfere with widespread acceptance of STI/HPV vaccines [1–3]. Issues identified include structural, pragmatic, and attitudinal factors and address problems related to implementation of any new vaccine, especially one for a targeted age-cohort like adolescents, as well as possible unique issues associated with a vaccine designed to prevent a sexually transmitted infection (STI). Some of the structural/pragmatic issues that can impact implementation of HPV immunization programs are vaccine cost and financing, possible limited vaccine supply, challenges associated with the establishment of a pre-adolescent healthcare visit for administering vaccine, procedures for administration of multiple vaccine doses, governmental approval of vaccine, vaccine storage requirements, and availability of an established public health infrastructure for efficient delivery of vaccine. Several of these issues (e.g. cost, storage requirements, public health infrastructure) may have a particularly
powerful impact on provision of HPV vaccine in resource-poor settings and developing countries [3] (for a more complete review of issues related to vaccine implementation in developing countries see Chapter 15).

With respect to attitudinal barriers, it is likely that individuals and groups who oppose vaccines in general will also oppose the HPV vaccine. Several researchers have examined different aspects of anti-vaccine attitudes, including the nature of news and internet coverage [4–6]. Although organized opposition to vaccination is largely a phenomenon in industrialized countries, it would be a mistake to assume that new vaccines will be uncritically embraced in developing countries [7]. Understanding the cultural factors that may interfere with or enhance the success of HPV immunization programs will therefore be very important.

In addition to the general opposition to vaccination, it is possible that there may be unique issues associated with a vaccine that targets a STI [1]. These issues may include the willingness of healthcare providers to recommend HPV vaccination, willingness of parents to have their children vaccinated, and the willingness of adolescents and young adults to receive vaccination. For instance, it has been hypothesized that parents may have concerns that support of HPV vaccination may convey the message to their children that they condone engagement in sexual behavior. Similarly, parents may be worried that HPV vaccination could lend a false sense of security to their children regarding susceptibility to a STI, thereby leading to earlier initiation of sexual behavior and/or failure to engage in adequate self-protective sexual behaviors. With respect to adolescents, will social stigma related to sexually transmitted diseases lead to reluctance to agree to vaccination? Healthcare providers may also hold personal beliefs that make them reluctant to recommend HPV vaccination or may have concerns about parental reaction to the recommendation. Furthermore, they may feel unprepared for, or uncomfortable with, the possibility that they may need to discuss with parents and/or adolescents issues of sexual behavior and STI.

Another HPV-specific issue that could have an impact on vaccine acceptance is the question of public awareness and knowledge about this infection. Do young women, parents, and healthcare providers have adequate levels of knowledge about HPV to make informed decisions about vaccination or recommendations to vaccinate?

3. Research review

3.1. Knowledge about HPV

Innumerable research studies, primarily undertaken in the US, Canada, and the UK, confirm poor levels of knowledge about HPV, Pap testing, and cervical cancer in women [8–11], and the few recent studies on men, including research on college students and gay/bisexual men, indicate that HPV knowledge among young men is even lower [12–14]. The articles referenced here represent a small fraction of the total number of published HPV knowledge studies, all of which are largely consistent in their findings that young women and men have limited awareness about HPV and related issues. Notably, there appears to be little research on HPV knowledge from other than English-speaking, industrialized countries, although one study in Mexico and another study in Brazil have found very low levels of knowledge about the role of HPV in cervical cancer among women [15,16]. Given that many of the nations in Africa and Latin America have the highest rates of cervical cancer worldwide [17], more research on HPV and cervical cancer knowledge and educational needs should include young women from these countries. The likelihood is that women in developing countries have even poorer knowledge about HPV than their counterparts in the US, Canada, and the UK.

Though women have been poorly educated about HPV, research studies show that there is a great desire for information about HPV infection [18,19]. In one study, over 85% of the participants thought that information about HPV should be given to individuals prior to sexual initiation and that healthcare providers are important sources of information [18]. Much of the responsibility for delivery of HPV vaccine will belong to healthcare providers who provide services to children and adolescents. It will be very important, therefore, that these individuals have a thorough understanding of the epidemiology of HPV infection in young people and the potentially severe sequelae of infection later in life. It is essential, then, that providers have accurate knowledge about HPV. Two studies in the US indicate only moderate knowledge about HPV among pediatricians and family physicians [20,21]. In contrast, a recent study of obstetricians and gynecologists (Ob-Gyn) and general practitioners (GP) in Mexico indicated relatively high levels of knowledge [22]. Another study in Mexico, in which a short questionnaire was applied to 25 coordinators of state and local cervical cancer screening programs within the public health system, found that 13 correctly identified HPV as a cause of cervical cancer but only seven could specify clinical manifestations of HPV [14]. A recent study of British nurses reported that they were generally aware of the relationship between HPV and cervical cancer but did not understand the differentiation of high-risk and low-risk types of HPV, nor which specific ones were associated with cervical cancer [23].

3.2. Attitudes of healthcare providers

Healthcare providers’ attitudes about HPV vaccination will be important to the successful implementation of HPV immunization programs. There have been four research studies published to date on healthcare providers’ attitudes about STI/HPV vaccination [20,21,24,25] (see Table 1 for details of these studies). Two of the studies presented respondents (nurse practitioners and Ob-Gyn) with a series of 13 vaccine scenarios in which the characteristics of the vaccine administration situation were varied systematically [24,25].
Respondents rated each vaccine on a scale of 0–100, reflecting their willingness to recommend the vaccine to parents of adolescents. The overall mean rating was 72 for the nurse practitioners and 79 for the Ob-Gyn, indicating a relatively positive orientation to these hypothetical vaccines. In both studies, the ratings indicated a relative preference for vaccinating older adolescents over younger adolescents and emphasized the importance of endorsement by professional organizations. Interestingly, the target of vaccination did not affect the ratings in either study, suggesting that the respondents did not differentiate among the vaccines in terms of sexual transmissibility of the infection prevented.

Two additional studies examined attitudes of pediatricians and family physicians toward recommending HPV vaccine for their adolescent patients [20,21]. Among both groups, participants were significantly more accepting of vaccination of older rather than younger adolescents and more willing to recommend the vaccine for girls over boys. Endorsement by professional organizations was seen as very important by both groups of physicians. In addition, both pediatricians and family physicians frequently cited parental reactions and objections to HPV vaccination as important potential barriers to vaccination.

Common findings across the four studies include the importance of approval by professional organizations and a preference for vaccinating older versus younger adolescents. Given that there is widespread agreement that the ideal age for HPV vaccination would be 13 or younger, it is a cause for some concern that all of the healthcare providers studied to date have a relative reluctance to vaccinate early adolescents. These findings may be explained by the well-documented reluctance to address sexuality issues with adolescent patients [26–28]. Although, in fact, there may be limited need to discuss sexual behavior with 12-year-old patients or their parents when recommending a HPV vaccine, it may be important to consider ways to help healthcare providers to develop the

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**Table 1**

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<th>Study</th>
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| Mays and Zimet [24]        | Series of vaccine scenarios rated on scale of 0–100. Scenarios varied by characteristics of patient age, vaccine target (herpes, HIV, mononucleosis), gender of patient, and professional endorsement | 1. Acceptability: mean scenario rating = 72 out of 100  
2. Relative preference for a vaccine endorsed by a professional organization, targeted toward older adolescents, and for prevention of HIV.  
Child’s sex had little effect on vaccine scenario ratings  
3. Correlates of acceptability: practitioners who spent more time in their practice with adolescents had higher acceptability scores |
| Raley et al. [25]          | Series of HPV vaccine scenarios rated on scale of 0–100. Scenarios varied by characteristics of patient age, vaccine efficacy, vaccine target (cancer and warts, cancer only, warts only), and professional endorsement | 1. Acceptability: mean scenario rating = 79 out of 100  
2. Relative preference for a vaccine endorsed by a professional organization, with greater efficacy, and targeted toward older adolescents or young adults  
3. Correlates of acceptability: no significant demographic correlates identified |
| Riedesel et al. [21]       | Twelve items assessed likelihood of recommending HPV vaccine on a five-point response scale. Items varied on the basis of child age, child sex, and whether vaccine prevented cervical cancer alone or both cancer and genital warts | 1. Acceptability: 40–97% of respondents indicated that they were somewhat or extremely likely to recommend HPV vaccination. Percent endorsement was dependent on age and sex of the child and on whether the vaccine prevented cancer alone or both cancer and cervical warts  
2. Preference was greater for vaccines targeted to older adolescents and girls and for a combined cancer/warts vaccine  
3. Correlates of acceptability: provider sex (females more likely to recommend), greater knowledge of HPV, professional organization endorsement, and fewer perceived barriers were associated with greater willingness to recommend HPV vaccine |
| Kahn et al. [20]           | Twelve items assessed likelihood of recommending HPV vaccine on a five-point response scale. Items varied on the basis of child age, child sex, and whether vaccine prevented cervical cancer alone or both cancer and genital warts | 1. Acceptability: 37–98% of respondents indicated that they were somewhat or extremely likely to recommend HPV vaccination. Percent endorsement was dependent on age and sex of the child and on whether the vaccine prevented cancer alone or both cancer and cervical warts. Mean rating across 12 items = 3.9 out of 5  
2. Preference was greater for vaccines targeted to older adolescents and girls and for a combined cancer/warts vaccine  
3. Correlates of acceptability: greater number of sexually active patients in practice, greater number of 10–15-year-olds seen in practice, knowledge about HPV, endorsement by other professionals, and fewer perceived barriers to immunization were associated with greater willingness to recommend a combined cancer/warts HPV vaccine |
necessary skills to be able to talk about sexuality when the need arises. Finally, as with the research into knowledge about HPV, more research on providers’ attitudes needs to include physicians and other health professionals from countries other than the US.

3.3. Attitudes of parents

Given that healthcare providers may view parental opposition as a major obstacle to vaccinating children against HPV, it is of interest to examine the empirical research on parental attitudes. Questions, in fact, have been raised regarding parental reaction to an STI/HPV vaccination recommendation [1]. Despite these concerns, most of the research on parental attitudes indicates relatively high levels of interest in STI/HPV vaccination [15,29–37]. Of these 10 published studies, two used qualitative interview methods [29,34], three focused on STI vaccines other than HPV [31–33], and two involved evaluations of brief information interventions [30,35]. All but two of the studies were based on research in the US, with one from Mexico [15] and one from the UK [36] (see Table 2 for details of these studies).

Overall, the parental attitude studies suggest a great deal of parent interest in HPV vaccination for their adolescent children. Some of the findings indicate that the sexual transmissibility of HPV may not be a significant obstacle to parental acceptance of the vaccine, although a small subset of parents appear to oppose HPV vaccination due, in part, to concerns that it may lead to increases in risky sexual behavior. The majority of parents were in favor of protecting their children from a serious infection with an effective vaccine, regardless of the source of infection. Parents generally valued their physicians’ recommendations regarding vaccination and several of the studies found parental health beliefs to be predictive of vaccine acceptability. Healthcare providers and public health policymakers may be able to encourage participation in HPV vaccine programs by reinforcing parents’ existing inclination to protect their children. Again, there needs to be more studies focusing on parental attitudes and cultural variations in those attitudes in developing countries.

Two parent studies in the US involved a brief informational intervention component [30,35]. One of these studies recruited over 500 parents of 10–15-year-old children from community and medical sites and asked them to complete questionnaires before and after reading a one-page information sheet about HPV [30]. The information provided included prevalence of infection, mode of transmission, and severity of sequelae. The pre-intervention results indicated that 55% of parents were in favor of vaccinating their children, 22% were unsure, and 23% were opposed. After reading the information sheet, acceptability of the vaccine rose to 73%. Most of the increase came from parents who had been previously undecided about vaccination. The other intervention study included 840 parents of 8–12-year-old children who responded to mailed surveys evaluating acceptability of HPV vaccination [35]. Half of the parents were randomized to also receive a detailed information sheet on HPV infection. Parents overall were moderately interested in HPV vaccination for their children. Parents who received the information sheet demonstrated higher knowledge about HPV than the comparison group. However, in contrast to the study described above, receipt of the information sheet did not affect attitudes about HPV vaccination. The differences in results may be a function of the different methodologies employed in the two studies. Clearly, further research on the effect of brief educational interventions that can be implemented in a clinic setting or field outreach center is needed.

3.4. Attitudes of adolescents and young adults

Given the sexual transmissibility of HPV, there has been some discussion that stigma associated with STI may prove to be a potential barrier to vaccine acceptance [1]. Although it makes sense to emphasize cervical cancer prevention when recommending HPV vaccination, a vaccine that includes HPV types associated with genital warts would be recognized as a STI vaccine. In addition, the media attention surrounding the availability of HPV vaccine will certainly address the STI dimension. Finally, consumers of healthcare have a right to receive complete, accurate information about HPV infection and vaccination. When considering vaccination of adolescents, it is clear that parents will be important, perhaps the most important, decision makers. However, attitudes of adolescents, particularly middle and older adolescents, should be taken into consideration. In one of the parent studies described above, for example, nearly 74% of the parents indicated that HPV vaccination should be a joint decision of the parent and child [36].

The empirical research suggests that concerns about the STI issue are largely unfounded and that adolescents and young adults in the US are very interested in HPV vaccination, especially one that prevents both genital warts and cervical cancer [32,38–41] (see Table 3 for details of these studies). For instance, in a study of 256 male and female university students, 74% said that they would accept an HPV vaccine [41]. Acceptance rates did not differ on the basis of respondents’ sex and were not affected by whether the vaccine was described primarily as an STI vaccine or a reproductive-health vaccine. Also, one of the studies of parents also included an examination of STI vaccine acceptability among their adolescent children [32], and like their parents, a high percentage of the children found STI vaccination to be acceptable.

Findings overall suggest that young women view HPV vaccination as beneficial, and there is no evidence that the STI issue substantially reduces personal acceptability of HPV vaccine. One study also showed that young men were interested in HPV vaccination, but this issue is deserving of more in-depth study. If vaccine efficacy in men is demonstrated and vaccine supply is sufficient, it may be an important pub-
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<th>Study</th>
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<td>Lazcano-Ponce et al. [15]</td>
<td>Self-administered written survey of women living in Cuernavaca, Morelos, Mexico (N = 880), including a subset of women with a child 10–15 years old (N = 525)</td>
<td>1. Acceptability: 84% indicated that they would be willing to have a teenage daughter receive HPV vaccination. 80% of women with a daughter 10–15 years of age indicated willingness to have their daughters vaccinated. 2. Correlates of acceptability: greater knowledge about the benefits of HPV vaccine and a history of two or more sexual partners were associated with greater willingness to have a teenage daughter vaccinated.</td>
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<td>Davis et al. [30]</td>
<td>Self-administered written survey of parents of 10–15-year-old boys and girls (N = 506). Data collected before and after a brief informational intervention about HPV in clinic and community settings in Georgia, USA</td>
<td>1. Acceptability: before the intervention, 55% wanted HPV vaccination for their children, 23% did not want to vaccinate their children, and 22% were undecided. After the intervention, more parents viewed the vaccine as acceptable (75% wanted HPV vaccination for their children) 2. Correlates of acceptability: parents interested in HPV vaccine for their children (post-intervention) were more likely to view the vaccine as effective and safe and less likely to believe that the vaccine could cause HPV infection or lead the child to engage in sexual activity</td>
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<td>Mays et al. [29]</td>
<td>Semi-structured in-person interviews with parents of 10–18-year-old children attending US healthcare clinics in Indiana (N = 34) Parents asked about the likelihood that they would have their child vaccinated against four STI, including HPV</td>
<td>1. Acceptability: 73% of parents indicated that they would have their child get an HPV vaccine 2. Reasons for acceptance: parents who wanted HPV vaccine for their children indicated a desire to protect their children, concern about severity of disease associated with infection, and sometimes referred to their own experiences with STI 3. Reasons for non-acceptance: parents who did not want HPV vaccine for their children indicated that they did not see their child as at risk for STI and some expressed the belief that STI could be prevented in other ways</td>
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<td>Zimet et al. [31]</td>
<td>Audio computer-assisted self-interviews (A-CASI) of parents accompanying adolescents (12–17 years old) to US healthcare clinics in Indiana (N = 278) Acceptability measured via a series of vaccine scenarios rated on a scale of 0–100. Scenarios varied by characteristics of mode of disease transmission (STI or non-STI), severity, vaccine efficacy, availability of behavioral prevention method</td>
<td>1. Acceptability: mean scenario rating = 81 out of 100 2. Relative preference for a highly efficacious vaccine that prevents a fatal illness for which there is no available behavioral prevention strategy 3. Correlates of acceptability: no significant demographic correlates identified</td>
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<td>Liddon et al. [33]</td>
<td>Telephone survey of parents in southern US states focusing on acceptance of herpes simplex virus (HSV)-2 vaccine (N = 315) A single item with a dichotomous response choice assessed whether a parent would agree to have a child vaccinated if the vaccine existed</td>
<td>1. Acceptability: 69% indicated that they would have a child receive vaccination if an HSV-2 vaccine was available. More mothers (73%) endorsed vaccination than fathers (59%) 2. Correlates of acceptability: unmarried parents, parents who reported that their child had received a flu shot, those with positive attitudes about vaccines, and those who believed that STI vaccines would decrease rates of STI were more accepting of vaccination for their children</td>
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<td>Olishen et al. [34]</td>
<td>Six focus groups and three qualitative individual interviews with parents attending US healthcare clinic (N = 25) Parents were asked about their attitudes toward HPV vaccination of children</td>
<td>1. Acceptability: parents generally expressed positive views of HPV vaccination, though many said that they did not have adequate information about the vaccine to fully evaluate it 2. Correlates of acceptability: parents who perceived their child to be at risk for infection were more accepting of HPV vaccination. Physician recommendation also was seen as very important for acceptance</td>
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<td>Zimet et al. [32]</td>
<td>A-CASI of parent-adolescent pairs recruited from US healthcare clinics located in Indiana (N = 320 pairs). Adolescents were 12–17 years old</td>
<td>1. Acceptability: 88% of parents had high scores on the STI vaccine acceptability scale (scores of 12–15). Eighty-five percent of the adolescents had high scores on the vaccine acceptability scale</td>
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lic health strategy to vaccinate young men as well as women, since men are an important vector in the transmission of the virus. Also, there is a great need for more research on personal acceptability in countries outside of the US.

3.5. Potential unintended consequences of HPV vaccination

The research presented above on parental attitudes about HPV vaccination of children indicates that some opposition to the vaccine is based on worries that vaccination will lead adolescents to engage in earlier initiation of coitus and to participate in riskier sexual behaviors. Concerns about this issue have also appeared in the news media [42]. It is not yet possible to evaluate directly whether these concerns are justified. However, several lines of reasoning argue against the notion that HPV vaccination will lead to increases in sexual behavior. First, research on school-based sex education and condom-availability programs indicates no subsequent increase in sexual behavior [43]. Second, the issue of sexual disinhibition is based on the assumption that adolescents have been delaying sexual behavior based on the inhibitory effects of fears about HPV infection. However, the research clearly indicates inadequate levels of knowledge about HPV, which suggests that it has not had a role in behavioral inhibition. Even if HPV knowledge was higher, nationally representative

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<th>Study</th>
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| Zimet et al. [32] continued | Acceptability of adolescent STI vaccination was assessed with a three-item scale asking about gonorrhea, genital herpes, and HIV vaccines. Each item had a five-point response format. Summed scores could range from 3 to 15 | 2. Correlates of acceptability among parents: parents who reported an STI history for themselves, who saw their children as more vulnerable to STI, and anticipated a stronger negative reaction of their child to a future STI diagnosis had higher vaccine acceptability scores. Parents who had greater concerns about vaccination leading to unsafe sexual behavior had lower scores.
3. Correlates of acceptability among adolescents: adolescents whose parents were more accepting of STI vaccination and who had friends who were sexually active had higher vaccine acceptability scores. |
| Brabin et al. [36] | Self-administered written survey of parents of 11–12-year-old children in Manchester, UK (N=317) A single item with a five-point response format assessed willingness to have their child vaccinated against HPV | 1. Acceptability: 81% of parents indicated they probably or definitely would have their child vaccinated
2. Attitudes about HPV vaccination: 84% of parents agreed that it is important to vaccinate before a child is sexually active and 76% endorsed universal vaccination
3. Correlates of acceptability: parents who believed that the vaccine would be effective, that information about the vaccine would be accurate, and who believed their child to be at risk for STI were more likely to endorse vaccination. Parents worried about vaccine safety, those with strong religious views, and those who thought the vaccine might encourage sexual activity were less likely to endorse vaccination. |
| Dempsey et al. [35] | Mailed written survey of parents of 8–12-year-old children in Seattle, WA, USA (N=840). Half of the parents were randomly selected to receive an additional information sheet about HPV with their mailed survey A three-item scale with 11-point response format (0–10) measured willingness to allow child to receive HPV vaccine at three different ages | 1. Acceptability: mean score = 6.6 out of 10 in the information-added group and 6.3 in the comparison group, indicating no statistically significant effect of the provision of HPV information
2. Correlates of acceptability: parents indicated a greater willingness to vaccinate older children compared to younger children. Parents with daughters and those reporting a personal history of genital warts more strongly endorsed vaccination. Parents who believed in the benefits of vaccination, those who perceived their child to be at increased risk for STI, and those who indicated that peers or the child’s physician would want them to vaccinate their child were more willing to consider vaccination. Parents who believed that their child would experience discomfort or danger related to vaccination were less likely to endorse HPV vaccination. |
| Slomovitz et al. [37] | Self-administered written survey of women with 8–14-year-old children recruited from adolescent gynecology clinics in Texas, USA (N=200) Three items with dichotomous response choices assessed whether a parent would agree to HPV vaccination for self, for a daughter, and for a son | 1. Acceptability: 77% indicated that they would accept an HPV vaccine for themselves. Sixty-seven percent of the women who had a daughter (N=156) and 66% who had a son (N=137) indicated willingness to have the child vaccinated
2. Attitudes about HPV vaccination: women opposed to their child receiving vaccine cited concerns about unknown adverse effects of vaccination and the belief that their child was not engaged in sexual activity
3. Correlates of acceptability: women whose children were up-to-date on all previous vaccinations and who endorsed HPV vaccination for themselves were more likely to endorse vaccination for their child. |
3.6. Acceptability research limitations and future needs

The data presented above obviously represent acceptability research prior to formal approval and availability of an actual vaccine and, in some cases, prior to widespread knowledge of ongoing multicenter, phase III trials of HPV vaccines. Thus, the findings may be limited by the hypothetical nature of the outcome and may not accurately gauge the issues that relate to vaccine acceptance. They do, however, provide some understanding of the attitudes surrounding HPV vaccination prior to initiating a widespread immunization program and suggest that parents, providers, and young people already have definite attitudes that may shape their behavior once a vaccine is available.

The data are also limited in other ways, including the lack of common theoretical models of behavior or uniform consideration of structural issues that will likely affect vaccine uptake. For instance, conclusions are difficult to draw about the acceptability of a vaccine to prevent STIs because this issue was addressed in methodologically different ways from study to study. Some of the data suffer from low response rates

Table 3
STI vaccine acceptability among adolescents/young adults

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<tr>
<th>Study</th>
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<th>Findings</th>
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| Zimet et al.   | Semi-structured in-person interviews with adolescent (N=20) and adult (N=20) women recruited from healthcare clinics in Chicago and Indianapolis, USA | 1. Rankings by adolescents and adults were highly concordant  
2. Rankings were most strongly influenced by efficacy, cost, and physician recommendation. Vaccine target did not substantially influence rankings, but in open-ended interview questions respondents identified cervical cancer prevention as an important feature of the vaccine |
| Hoover et al.  | Questionnaires administered to women (16–28 years old) recruited from New Jersey, USA (N=60) | 1. Attitudes about HPV vaccination: women preferred a vaccine that protected against 70% of cervical cancers and 100% of genital warts compared with one that protected against 85% of cancers. Most felt that women should be vaccinated before initiating sex (88%) and that men should be vaccinated to protect their partners (95%). Sixty-eight percent said that they would be somewhat or extremely likely to pay for the vaccine if it was not covered by insurance |
| Boehner et al. | Self-administered written survey of male and female college students in Ohio, USA (N=259) completed a questionnaire about herpes vaccination. Two hundred and fifty-six of them also completed a questionnaire about HPV vaccination | 1. Acceptability: 74% indicated that they would accept a vaccine for genital herpes. Seventy-four percent also indicated that they would accept an HPV vaccine  
2. Correlates of HPV vaccine acceptability: a greater number of sex partners, belief in vaccine’s safety, belief that parents would support vaccination, low cost of vaccine, and belief in a universal vaccination strategy were associated with willingness to accept HPV vaccination. No difference in acceptability were found for vaccines described as STI vaccines vs. reproductive-health vaccines |
| Kahn et al.    | Self-administered written survey of young women (18–30 years old) recruited from sites in Ohio, USA (N=52) | 1. Acceptability: 85% indicated that they would be very or extremely likely to receive an HPV vaccine  
2. Correlates of HPV vaccine acceptability: a greater number of sex partners, belief that others (partners, parents, providers) would support vaccination, and greater knowledge about HPV were associated with willingness to accept HPV vaccination |
| Zimet et al.   | See description in Table 2                                                             | Findings reported in Table 2                                                                                                                        |
| Slomovitz et al.| See description in Table 2                                                             | Findings reported in Table 2                                                                                                                        |

data show that fear of STI (including HIV) is not a major motivation for abstinence among 15–19-year-olds in the US who have never had sex [44]. Third, values about sexual behavior communicated by parents to their children are unlikely to be undermined by a single vaccine. It certainly will be important to clearly communicate to parents and adolescents that HPV vaccination does not protect against all types of HPV and does not protect against other STIs. Parents may also want to emphasize that there are reasons for delaying sexual intercourse other than avoidance of STI.

Another unintended consequence issue relates to cervical cancer screening and the concern that vaccination may lead to a false sense of security with respect to cervical cancer risk and significantly reduced rates of Pap testing. It is essential that women, whether vaccinated or not, continue to undergo regular Pap testing for a number of reasons [3]. Clearly, therefore, an important role of healthcare providers will be to provide anticipatory guidance about the ongoing need for screening. These issues again serve to illustrate the importance of educating parents and adolescents about the nature of HPV infection and its relationship to women’s health.
and others are based on convenience samples that limit generalizability. One criticism of the existing published research highlighted here is the lack of data about acceptability in developing countries, where efficacious vaccines could possibly have the greatest impact.

As vaccines are approved and become available, it is important to be able to monitor beliefs, attitudes, and behaviors of the populations involved. This includes issues related to uptake, but also reaction to HPV vaccine (e.g., possibility of changes in sexual behavior and cervical cancer screening). Perhaps the most urgent need for this type of attitudinal and behavioral data is acceptability in developing countries, where cultures, including adolescent sexual cultures, vary widely. Health-systems’ research will be important in all settings, but should address the issues unique to the developing world. Such issues include elements like distribution, provider acceptance, provider training in how to talk about HPV vaccination, and infrastructure, including access to healthcare, refrigeration, and transportation. Globally, there should be more of a research focus on high-risk and/or hard to reach populations to ensure uptake among those most at risk of death from cervical cancer. Furthermore, in order to ensure the effectiveness of communication strategies, including mass media campaigns, studies on the development of effective and informative, persuasive messages regarding HPV vaccination will be very important.

4. Conclusions

Current research on psychosocial issues and HPV vaccination indicates that many women and healthcare providers have relatively low levels of knowledge about HPV and could benefit from educational interventions. Part of this education ought to focus on the importance of targeting vaccination, particularly to pre- and early-adolescents, in order to ensure that immunity is conferred before the most vulnerable youth engage in sexual intercourse. Research studies also indicate that healthcare providers, parents, and adolescents are generally very interested in HPV vaccination. Existing research does not show particular opposition to STI vaccination. Concerns about unintended consequences of HPV vaccination cannot be directly evaluated until after HPV vaccine becomes available, but there are several compelling arguments that HPV vaccination will not result in substantial increases in risky sexual behavior. This concern, as well as the concern about post-vaccine screening reduction, can also be addressed through anticipatory guidance delivered by healthcare providers.

Across all of the psychosocial research related to HPV vaccination, the most notable issue is the lack of studies focusing on individuals from developing countries. Women in these countries typically have the highest rates of cervical cancer and therefore could benefit greatly from HPV vaccination. A number of articles have addressed the cultural, political, and organizational issues associated with introducing vaccines in developing countries, and point to the specific need for understanding the variation of issues within certain political and cultural contexts [7,45–47]. For instance, state regulation by certain political regimes will likely impact whether vaccine acceptance is more of a passive or an active process [45]. It will be important over the next few years to apply these lessons to research on HPV vaccine in order to ensure the optimal development of HPV immunization programs in developing countries.

Disclosed potential conflicts of interest

GDZ: Consultant (GlaxoSmithKline, Merck and Co., Inc.)
SLR: Speakers Bureau (Merck and Co.); Advisory Board (GlaxoSmithKline, Merck and Co., Inc.); Research Grants (GlaxoSmithKline)
EL: Consultant (Merck and Co., Inc.).

References


[42] Silverman E. Cancer vaccine will be a hard sell. Newark Star Ledger; April 3, 2005.


