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Disclosure of Genital Human Papillomavirus Infection to Female Sex Partners by Young Men

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Abstract

A survey was administered to male university students testing positive for high-risk human papillomavirus. Disclosure was more likely in men with fewer partners, in main partnerships, and in longer partnerships. Disclosure was associated with discussing the Pap test/HPV vaccine with female partners and not associated with a worsening relationship.

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Keywords

human papillomavirus; male; disclosure; sexually transmitted infection; sexual partnerships

Genital human papillomavirus (HPV) is one of the most common sexually transmitted infections (STIs), with several types considered high-risk (HR) for cervical cancer. As men transmit HPV to their female sex partners, it is important to include men in prevention strategies for reducing HR-HPV and cervical cancer (1). While the US Food and Drug Administration (FDA) approved the use of HPV vaccine for men 9–26 years of age, testing men for HR-HPV is considered “off-label” and is not recommended by national medical organizations. However, a 2004 survey found that 62% of a representative sample of clinicians who used HPV DNA tests and saw male patients reported having used HPV tests in men (2). It is currently unknown, however, whether men who find out their HR-HPV DNA status are communicating this knowledge to their partners. In light of apparent male testing and limited research in HPV disclosure, we developed a survey on HR-HPV disclosure by young men to their female sex partners to determine: 1) factors associated with self-reported disclosure of incident HR-HPV infection; 2) if disclosure is associated with discussion of Pap test/HPV vaccine and 3) if disclosure is associated with a perceived change in relationship.

From June 2003 to April 2010, we conducted a longitudinal HPV study of male university students in Seattle, USA. Recruitment and data collection methods have been described elsewhere (3). Male university students were eligible if they were 18–21 years old, residents of Washington State, in good health, able to provide informed consent, and reported a history of sexual activity with a female. At each tri-annual study visit, the research clinician performed a genital examination and collected penile, scrotal, and distal urinary tract cell specimens. PCR-based methods were used to detect HR-HPV types (HPV16/18/26/31/33/35/39/45/51/52/53/56/58/59/66/68/73/82 and IS39) and types of uncertain cancer potential (HPV62/64/67/69/71/83/84).

A brief, self-administered, close-ended survey on disclosure was developed based on our earlier male perspectives survey (1) and other STI disclosure/notification surveys (4–6) (Bita Amani, personal communication). Assessment was done at the partnership level, with information collected on up to the 5 most recent female sex partners in the past year. At each visit, men were notified of their HPV genotyping results from the prior visit’s sampling. During notification, the clinician provided counseling and HPV informational material, and explained that certain types are associated with cervical cancer risk without encouraging disclosure. From January 2008 to January 2010, those who had an incident HR-HPV infection (including HPV types of uncertain cancer potential) were asked, at the subsequent visit following notification, to participate in a confidential, online survey. Incident HR-HPV infection was defined as the first detection of a specific HR or uncertain cancer potential type following a prior negative test for that type. Subjects were allowed to take the survey more than once at subsequent visits for each additional incident HR-HPV infection.

Statistical analyses were done using Stata 10.0 (Stata Corp., College Station, TX). The generalized linear model (binomial family, log-link) with binary outcomes was used to obtain relative risks (RR’s) and 95% confidence intervals (CI’s). We accounted for non-independence among partners of the same subject and subjects who participated in the survey more than once using the sandwich variance estimator. To assess if disclosure was associated with Pap test/HPV vaccine discussion, HR-HPV disclosers were asked if they had such discussion after disclosure and HR-HPV non-disclosers were asked about such discussion after HR-HPV notification. Similarly, for any perceived relationship change, we

asked if the subject had such change after disclosure among disclosers and after notification among non-disclosers. Variables significantly associated with disclosure in univariate analyses were included in a multivariate model.

Eighty-one (94%) of 86 eligible men with an incident HR-HPV infection completed the survey contributing 264 partner-specific observations. Fifty-five men took the survey once, 20 men twice, 5 men three times, and 1 man four times. Representative of this student population, subjects were predominantly white (Table 1). Disclosure was reported in 81/264 (31%) partnerships, with 43/81 (53%) partnerships disclosing right after and 18/81 (22%) disclosing within the first week of notification. Promoters of disclosure centered on themes of honesty and caring (Table 2), while perceived disincentives were diverse (Table 3). Disclosure was associated with main partnership type, longer partnership length, fewer partners (Table 4), and with an increased likelihood of discussing Pap tests/HPV vaccine (Table 5). After accounting for confounding, disclosure was not significantly associated with relationship change (Table 5). Among subjects that reported a change in relationship after disclosure, 9/24 (38%) improved relationships attributed it to disclosure, while 2/12 (17%) worsened relationships attributed it to disclosure. Negative responses after disclosure were uncommon (Table 6), and only 7/81 (9%) disclosures reportedly led to an argument. After disclosure, when asked whether their partners asked them about their past sex history, recent sex partners, their condom use, or the HPV vaccine, the respective proportions were 40%, 31%, 20%, and 26%.

To date, few studies have assessed disclosure of HPV infection. While other HPV disclosure studies (6–9) have reported disclosure to a partner ranging from 39%–65%, this study found that young males disclosed to about a third of their recent female partners; the lower disclosure proportion may be due to the assessment of all partners during the past year. Similar to our findings, a recent study on disclosure of genital warts reported that longer and closer relationships were most predictive of disclosure (10). Partnerships with strong emotional ties in general appear to be important in STI disclosure (11–14), and consistent with the literature, we found that honesty and caring for the partner were important promoters of HR-HPV disclosure (6, 10) while embarrassment (6, 10) and presumed protection from condom use (10) were commonly reported disincentives. We did not find fear of rejection (6) or stigma perception (10) to be barriers, and blame (15) was not a major reason for disclosure.

We previously found that sexually active men diagnosed with HPV intended to encourage their partners to obtain Pap tests (1) and the current study results support these findings. In addition, we found that disclosure was associated with HPV vaccine discussion, an activity that is likely to promote education about the risks and benefits of HPV immunization. Still, there has been concern that STI disclosure/notification could dissolve relationships and lead the infected individual to form new partnerships, leading to greater transmission (11). Our results, however, agree with the limited number of HPV studies that did not find disclosure to be associated with negative relationship outcomes (6, 10, 16, 17). The majority of disclosers reported that their partners were supportive, and only a low proportion of disclosers attributed a worsening relationship to disclosure. A recent study of genital warts also found that partner response after disclosure was more supportive than disclosers had expected (10); with increasing HPV awareness (10), women may have become more normalized to HPV (8). Moreover, these findings broadly agree with other STI studies that found that disclosure/notification does not appear to have negative relationship outcomes (11, 18, 19). Indeed, partnership dissolution rates in general are already high in the US (20, 21), and STI disclosure may have less influence on partnerships than imagined (11).

This study has important limitations. As subjects were college students, the results may not be generalizable to other heterosexual males. However, as approximately 65% of US males who complete high school enroll in college the year following graduation (22), our findings may have important implications for this large segment of the population. While over-reporting of disclosure (1) might have occurred, bias was minimized by use of a self-administered online survey. Moreover, among the 71 “disclosing” men who reported intercourse, only 18 (25%) reported disclosing their HR-HPV infection before the act. While such “delayed disclosure” (5) was not ideal, it reflected the potentially limited social desirability bias operating in this survey (perhaps partly due to the fact that subjects were aware that disclosure is not recommended).

It is possible that disclosers were self-selectors who did not expect a negative partner response (10). However, prior studies have reported disclosure to be unassociated with anticipated negative consequences (10, 23), and we did not find fear of rejection or loss of relationship to be important reasons for non-disclosure. Importantly, we found the effect of disclosure on relationship change to be similar for both main and casual partnerships and we controlled for partnership type in the analysis. Lack of adjustment for partnership type has been a limitation in previous studies (11, 18, 24), as subjects are more likely to disclose to main partners (24). One HIV disclosure study that assessed those only in main partnerships found that disclosers were indeed less likely to experience partnership dissolution than non-disclosers (19).

This study provides the first data on the correlates and outcomes of male-to-female disclosure of HR-HPV infection. Disclosure did not lead to a perceived worsening relationship, and as disclosers were more likely to discuss the Pap test/HPV vaccine with their partners than non-disclosers, disclosure might be associated with public health benefits that derive from discussions about preventing HPV infections and cervical cancer.

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TABLE 1

Characteristics of 81 males at the time of incident high-risk human papillomavirus (HR-HPV) infection notification, Seattle, USA.

Characteristic	n (%)
Race/ethnicity	
White	64 (79%)
Asian	6 (7%)
Other	11 (14%)
Median age at first vaginal intercourse, years (range)	17 (12–20)
Mean age, years (standard deviation) ^a	21.0 (1.0)
Median number of partners in previous year (range) ^a	2 (1–9)

^aN = 114 men accounting for men who took the survey more than once for additional incident HR-HPV infections.

TABLE 2

Reasons given for why 46 male university students in a total of 81 partnerships decided to disclose their HR-HPV infection to their female sex partners.

Reason	n (%)
Wanted to be honest with her	73 (90)
Felt it was right thing to do	72 (89)
Cared about her	71 (88)
Had strong emotional ties to her	61 (75)
Wanted her to hear it from me	22 (27)
Felt that it wasn't a big deal	8 (10)
She already knew she had HPV ^a	6 (8)
Felt that HPV was her fault	4 (5)
Needed to explain a change in condom use	3 (4)
Other reason ^b	2 (2)
"Her prior HPV vaccination"	1 (1)
"Was confused and thought she may have given it to me"	1 (1)

^a 41 men in 73 partnerships (90%) viewed this option because it was added later to the survey on July 17, 2008.

^b The survey allowed participants to select reasons from a list or use free form entry to add any reasons not listed.

TABLE 3

Reasons given for why 58 male university students in a total of 183 partnerships did not disclose their HR-HPV infection to their female sex partners.

Reason	n (%)
Felt that using condom was protective enough	64 (35)
Not in a serious relationship with her	62 (34)
Didn't know what to say	55 (31)
Embarrassed to bring up the topic	49 (27)
Didn't think disclosure was important	45 (25)
Worried that she would tell others I have HPV	23 (13)
Afraid she might get angry with me	17 (9)
Fear of rejection or loss of relationship	14 (8)
Didn't know her contact information	11 (6)
Didn't know her name	5 (3)
Afraid she would think I was cheating	3 (2)
She already knew she had HPV ^a	3 (2)
Angry at her for giving me HPV	2 (1)
Other reason ^b	49 (27)
Didn't know at the time/yet	23 (13)
She had been vaccinated	10 (5)
Forgot/didn't think about it/not a big deal	6 (3)
Was drunk at the time	3 (2)
"She gave to me. prob knows she has it"	1 (0)
"No opportune time to discuss it"	1 (0)
"Not participating in any activity that would directly transmit HPV"	1 (0)
"I wasn't having sexual relations with her when I found out"	1 (0)
"By that time the infection was already gone"	1 (0)
"It was gone by the time I had sex with her"	1 (0)

^a 51 men in 153 partnerships (84%) viewed this option because it was added later to the survey on July 17, 2008.

^b The survey allowed participants to select reasons from a list or use free form entry to add any reasons not listed.

TABLE 4

Correlates of incident HR-HPV infection disclosure among 81 men in 264 partnerships.

Partnership characteristics	Disclosure (N = 81) n/N (%) ^a	Relative risk (95%CI)	Adjusted relative risk (95%CI) ^b
Self-defined partnership type			
“Casual”	16/163 (9.8)	1.0	1.0
“Main”	64/100 (64.0)	6.5 (3.7–11.4)	2.1 (1.1–4.0)
Length of partnership (tertile) ^c			
<2 wk	4/87 (4.6)	1.0	1.0
2 wk - 11 mo	18/80 (22.5)	4.9 (1.8–13.6)	2.0 (1.4–3.0)**
>11 mo	53/78 (67.9)	14.8 (4.5–48.2)*	
Time of last sex (tertile)			
<2 wk ago	51/77 (66.2)	1.0	1.0
2 wk - 5 mo ago	13/83 (15.7)	0.3 (0.1–0.5)	0.8 (0.7–1.0)**
>5 mo ago	12/89 (13.5)	0.2 (0.1–0.4)*	
Subject characteristics			
Race/ethnicity			
White	66/203 (32.5)	1.0	
Asian	9/25 (36.0)	1.1 (0.4–2.8)	
Other	6/36 (16.7)	0.5 (0.2–1.2)	
Age at time of survey			
19 y	6/21 (28.6)	1.0	
20	19/63 (30.2)	1.1 (0.4–2.9)	
21	24/102 (23.5)	0.8 (0.3–2.4)	
22	27/64 (42.2)	1.5 (0.5–4.2)	
23	5/14 (35.7)	1.3 (0.3–4.8)	
Age at first vaginal intercourse			
<16 y	13/57 (22.8)	1.0	
16	17/52 (32.7)	1.4 (0.7–3.1)	
17	18/90 (20.0)	0.9 (0.4–2.1)	
18	28/52 (53.8)	2.4 (1.2–4.7)	

Partnership characteristics	Disclosure (N = 81) n/N (%) ^a	Relative risk (95%CI)	Adjusted relative risk (95%CI) ^b
>18	5/13 (38.5)	1.7 (0.5–6.2)	
No. partners in past year			
1	34/45 (75.6)	1.0	1.0
2	28/58 (48.3)	0.6 (0.4–0.9)	0.9 (0.8–1.0) ***
3	7/45 (15.6)	0.2 (0.1–0.4)	
4	3/31 (9.7)	0.1 (0.1–0.3)	
5	9/85 (10.6)	0.1 (0.1–0.4) *	
Concurrent partnership ^d			
No	16/79 (20.3)	1.0	
Yes	28/127 (22.0)	1.1 (0.6–2.1)	

^a n is the number of disclosures and N is the total number of observations for the row variable; the sum of n's for a variable may be less than 81 due to missing data.

^b adjusted for each other for variables listed in the adjusted relative risk column

^c period between date of first sex and last sex

^d defined as any temporal overlap in partnerships, among those with >1 partner

* Trend: $P < 0.001$

** per tertile increase

*** per partner increase, with maximum of 5 partners

TABLE 5

Outcomes of incident HR-HPV infection disclosure among 81 men in 264 partnerships.

Outcome	Disclosure (N = 81) n (%)	Non-disclosure (N = 183) n (%)	Relative risk (95%CI)	Adjusted relative risk (95%CI)
Discussion of Pap test/HPV vaccine ^a				
No	12 (14.8)	169 (92.3)	1.0	1.0
Yes	69 (85.2)	13 (7.1)	11.9 (5.9–24.1)	6.0 (2.9–12.7) *
Perceived relationship change ^b				
No change	41 (50.6)	58 (31.7)	1.0	1.0
Worsened	12 (14.8)	72 (39.3)	0.4 (0.2–0.7)	0.7 (0.4–1.3) **
Improved	24 (29.6)	9 (4.9)	2.7 (1.1–6.7)	1.7 (0.7–4.0) ***

^a 1 non-discloser did not answer the question on Pap test/HPV vaccine for 1 partner.

^b 1 non-discloser did not answer the question on relationship change for 1 partner; excludes 4 partners that the discloser was no longer in a relationship with at the time of HR-HPV notification and 43 partners that the non-discloser was no longer in a relationship with at the time of HR-HPV notification.

* adjusted for other predictors of disclosure and discussion of Pap test/HPV vaccine: partnership type, number of partners in the past year.

** adjusted for other predictors of disclosure and perceived worsening in relationship: partnership type, number of partners in the past year, length of partnership, time of last sex.

*** adjusted for other predictors of disclosure and perceived improvement in relationship: partnership type, number of partners in the past year, length of partnership, time of last sex.

TABLE 6

Male perception (n = 46) of the response they received from their female sex partners (n = 81) after HR-HPV infection disclosure.

Partner response	n (%)
Supportive	53 (65)
Worried	34 (42)
Concerned	33 (41)
Stressed	18 (22)
Confused	17 (21)
Embarrassed	12 (15)
Consoling	10 (12)
Shocked	5 (6)
Blaming	5 (6)
Angry	4 (5)
Depressed	2 (2)
Other response ^a	15 (19)
Indifferent/unconcerned	8 (10)
Accepting/understanding	2 (2)
Inquisitive/curious about HPV	2 (2)
Denial	1 (1)
"Told me that she had already been diagnosed with HPV"	1 (1)
"She couldn't afford the vaccine anyway"	1 (1)

^aThe survey allowed participants to select responses from a list or use free form entry to add any responses not listed.