

HPV Awareness and Willingness to HPV Vaccination among High-Risk Men attending an STI Clinic in Puerto Rico

Vivian Colón-López, PhD, MPH*†; Lizbeth M. Del Toro-Mejías, BS‡; Ana P. Ortiz, PhD, MPH†‡; Guillermo Tortolero-Luna, MD, PhD†§; Joel M. Palefsky, MD**

Objective: An HPV vaccine has been approved for men aged 9 to 26 in the US for the prevention of genital warts and anal cancer. The purpose of this study is to describe 1) HPV vaccine awareness, 2) willingness to get the HPV vaccine and 3) perceived susceptibility to HPV-related cancers and genital warts among men 18-26 years old who attend an STI clinic in San Juan, Puerto Rico (PR).

Methods: A cross-sectional pilot study consisting of 206 HIV+/HIV- men. For purpose of this analysis, only those participants aged ≤26 years old were included in this analysis (n=46).

Results: None of the study participants had been vaccinated against HPV. Fewer than a third knew about the HPV vaccine (28.3%). However, more than half (76.9%) were willing to be vaccinated against HPV. Information sources about the HPV vaccine included their female sexual partners (13.0%), a female sexual partner who received the vaccine (8.7%) and a male sexual partner (2.2%). Most participants reported that the main reason that would increase their willingness to get vaccinated was if a physician recommend the vaccine (95.7%). Perceived susceptibility was low, particularly for anal and oral cancer.

Conclusion: This pilot study shows poor awareness of the HPV vaccine, although willingness to getting the HPV vaccine was high among those who knew about the vaccine. Future studies should try to evaluate this paradox and study in depth willingness and barriers to vaccination among male sub-groups, such as men who have sex with men (MSM). These studies should also evaluate predictors of uptake of the HPV vaccine among men in this and other STI clinics in PR, in order to develop interventions to increase male vaccination. [*P R Health Sci J* 2012;4:227-231]

Key words: HPV Infection, HPV Vaccine, HPV Awareness, Men, Puerto Rico

Human papilloma virus (HPV) is a common sexually transmitted infection (1, 2). Studies have reported that oncogenic HPV types may be responsible for HPV-related cancers in men, such as oropharyngeal, anal, and penile cancer (3). Men are at risk for HPV infection and can benefit from vaccination, but vaccination rates remain low (4), with reports indicating only 1.4% of young men have received at least one dose in the US (5). The Centers for Disease Control (CDC) Advisory Committee on Immunization Practices (ACIP) recommends routine HPV vaccination for males at 11 or 12 years of age, or at 13 to 21 years of age if not previously vaccinated. Males 22 to 26 years of age may also be vaccinated (6, 7). Since this is not a live vaccine, it can be administered to immunocompromised persons through age 26 years not previously vaccinated. This vaccine is recommended for men who have sex with men (MSM) through age 26 years not previously vaccinated (7).

Given the burden of HPV-related malignancies and the availability of an effective vaccine to decrease the incidence of HPV-related external genital lesions (8, 9), as well as reducing the risk of anal cancer (10), understanding HPV

vaccine awareness and willingness to receive the HPV vaccine is important for effective prevention programs with the objective of decreasing the burden of HPV (11). The objective of this pilot study was to describe 1) HPV vaccine awareness, 2) willingness to HPV vaccination and 3) the perceived susceptibility to HPV-related cancers and genital warts among men aged 18-26 years old who attend an STI clinic in Puerto Rico (PR).

*Department of Health Services Administration, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; †Cancer Control and Population Sciences Program, University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico; ‡Department of Biostatistics and Epidemiology, Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; §Department of Obstetrics and Gynecology, School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico; **Department of Medicine, University of California, San Francisco, United States of America.

The authors have no conflict of interest to disclose.

Address correspondence to: Vivian Colón-Lopez, PhD, MPH, PO Box 365067, San Juan, PR 00936-5067. E-mail: vivian.colon@upr.edu

Methods

We conducted a cross-sectional study of 206 men, 18 years and older, attending the Centro Latino Americano de Enfermedades de Transmisión Sexual (CLETS) in 2009-2010. This study was part of a parent study among men and women attending this STI clinic in San Juan, PR. The study design and methods have been described elsewhere (12). Briefly, the design of the parent study includes a consecutive selection of men and women, from the clinic waiting room. Following completion of the informed consent, subjects participated in a face-to face behavioral interview, and a supplemental survey that contained information related to HPV knowledge, including assessments of HPV transmission knowledge, susceptibility to HPV-related cancers (penile, anal, oral) and vaccine acceptability. Information from the surveys was gathered using the QDS system (Questionnaire Design System, Nova Research Co., Bethesda, Maryland). Both studies were previously approved by the University of Puerto Rico, Medical Sciences Campus Institutional Review Board (IRB).

HPV vaccine awareness and willingness to be vaccinated

Men were asked if they had ever heard about the HPV vaccine before the survey. Those men who reported having heard of the HPV vaccine were also asked questions regarding where they had heard of the HPV vaccine (information sources), factors that might influence vaccination willingness, and if they were interested in HPV vaccination in the future.

Perceived susceptibility to HPV-related morbidities

We assessed perceived susceptibility to HPV-related morbidities (cancer and genital warts) with the following question: 'How do you describe your risk for anal, oral, penile and genital warts?' by using a 4-item scale [0=Not sure how to assess my risk; 1=Not at risk/low risk; 2=At moderate risk; 3=At high risk].

Statistical Analysis

From the total sample of 206 men who participated in our study, only 46 (22.3%) subjects aged 18-26 years were included in this analysis, given that this age groups are included within the recommended age for vaccine administration (4, 5). Frequency distributions and summary measures were used to describe the study sample using SPSS version 17 (Chicago, IL).

Results

Most participants had more than high school education (89.2%) and were employed at the time of the interview (78.3%). A third of the sample (34.8%) reported having used illegal or illicit

drugs in the last 3 months, 32.6% reported being circumcised, and almost half (45.7%) attended the clinic for the first time at the time of the interview (Table 1).

A third of the study participants reported being MSM (32.6%) and more than half (54.8%) of the heterosexual men in this sample reported having sex with more than 10 female sexual partners in their lifetime. The lifetime self-reported prevalence of genital warts in the total sample was 26.1%, whereas 6.5% were HIV positive and 23.9% had ever had Chlamydia (Table 1).

HPV vaccine awareness and willingness

None of the study participants had been vaccinated against HPV and less than a third (28.3%) knew about the HPV vaccine. However, more than half of those who knew about the vaccine (76.9%) were willing to be vaccinated against HPV (Table 1). Sources of information of the HPV vaccine included their female sexual partners (13.0%), a female sexual partner who had received the vaccine (8.7%), and a male sexual partner (2.2%).

Table 2 shows factors influencing vaccination. In the overall sample, reported reasons that would lead study participants to be vaccinated included: if the physician recommended it (95.7%), if health insurance covers the vaccine (91.3%), and if the participants knew the vaccine's importance for their health (91.3%) (Table 2). Among those who knew about the HPV vaccine but had not been vaccinated (28.3%), the majority reported that they would be willing to receive the vaccine if a physician recommends it and if they understand the vaccine's importance for their health (data not shown). The principal reasons that men who knew about the vaccine indicated for not had been vaccinated against HPV were the lack of understanding of being at risk for HPV infection followed by the high cost of the vaccine.

When contrasting heterosexual versus MSM, regarding the factors influencing vaccination, 82.6% of the heterosexual men interviewed reported that they would be willing to get vaccinated if they knew that the vaccine would protect their female sexual partners against genital warts and cervical cancer. However, only half of the MSM interviewed would be willing to be vaccinated against HPV if they knew that the vaccine would protect their male partners against genital warts (52.2%) or HPV-related cancers such as a penile or anal cancer (50.0%).

HPV Susceptibility

The majority of the study participants indicated that they perceived that they were at little or no risk for genital warts and HPV-related cancers (Figure 1). For anal cancer, approximately a third (32.6%) of the participants reported having low risk or no risk at all, followed by participants who indicated they were not sure how to assess their risk (30.4%). The majority (58.7%) also reported that they were at low risk or at no risk at all for oral cancer.

Table 1. Univariate analysis among a sample of men aged 18 to 26 years attending an STI clinic in PR, 2009-2010 (n=46).

Variables	N	%	Variables	N	%
Sociodemographic characteristics			Female Sexual Partners (last 90 days)		
<i>Age (years)</i>			None	18	39.1%
mean ± SD: 21.70 ± 2.35			1 partner	19	41.3%
<i>Educational Level</i>			> 1 partner	9	19.6%
< High School	5	10.9%	<i>Lifetime MSM Sexual Partners†</i>		
≥ High School	41	89.2%	< 10 partners	9	60.0%
<i>Employment</i>			≥ 10 partners	6	40.0%
No	10	21.7%	<i>Circumcised</i>		
Yes	36	78.3%	No	36	78.3%
<i>Individual Annual Income</i>			Yes	15	32.6%
None	10	21.7%	Self-reported STIs (Lifetime)		
< \$15,000	29	63.0%	<i>Genital Warts</i>		
≥ \$15,000	7	15.2%	No	34	73.9%
<i>Place of Birth</i>			Yes	12	26.1%
Puerto Rico	42	91.3%	<i>Chlamydia</i>		
Other	4	8.7%	No	35	76.1%
<i>Health Insurance</i>			Yes	11	23.9%
None	13	28.3%	<i>HIV</i>		
Public	13	28.3%	No	43	93.5%
Private	20	43.5%	Yes	3	6.5%
Behavioral Risk Factors			<i>First time at STI Clinic</i>		
<i>Tobacco Use (last 90 days)</i>			No	25	54.3%
No	23	50.0%	Yes	21	45.7%
Yes	23	50.0%	HPV Vaccine		
<i>Alcohol Use (last 90 days)</i>			<i>HPV vaccine awareness</i>		
No	10	21.7%	No	33	71.7%
Yes	36	78.3%	Yes	13	28.3%
<i>Drug Use (last 90 days)</i>			<i>HPV Vaccine Willingness**</i>		
No	30	65.2%	No	3	23.1%
Yes	16	34.8%	Yes	10	76.9%
<i>Self-reported sexual Identity</i>			<i>Sources of Information about HPV vaccine**</i>		
Heterosexual	31	67.4%	Female sexual partner	6	13.0%
MSM	15	32.6%	Female sexual partner who have received the vaccine	4	8.7%
<i>Lifetime Female Sexual Partners*</i>			Male sexual partner	1	2.2%
< 10 partners	13	41.9%			
≥ 10 partners	17	54.8%			

*Only those who self-reported as heterosexual (n=30, 1 missing value); †Only who identified as (MSM) (n=15); **Only those who answered that knew about the HPV vaccine (n=13, 2 missing values)

Table 2. Factors influencing vaccination among a sample of men aged 18 to 26 years attending an STI clinic in PR, 2009-2010 (n=46).

Would accept the HPV vaccine if...	N (%)
Doctor recommends it	44 (95.7%)
Other health professional recommends it	40 (87.0%)
Health insurance covers it	42 (91.3%)
Vaccine is free	41 (89.1)
Sexual partner recommends it	40 (87.0%)
Relative recommends it	37 (80.4%)
Friend recommends it	30 (65.2%)
Know the vaccine's importance for his health	42 (91.3%)
It's offered at school or college	37 (80.4%)
It protects a female sexual partner against genital warts and cervical cancer	38 (82.6%)
It protects a male sexual partner against genital warts	24 (52.2%)
It protects a male sexual partner against penile or anal cancer	23 (50.0%)

Discussion

This pilot study highlights the poor awareness of the HPV vaccine in a small sample of high-risk young men (18-26 years) attending an STI clinic in San Juan, PR. However, among those who knew about the vaccine, interest in getting vaccinated was high. High acceptability has also been reported previously in other male populations (4), including MSM (14). In this study, separate analysis showed that a higher proportion of MSM (53%) were aware of the HPV vaccine as compared to heterosexual men (16%, p=0.01), although acceptability was similarly high in both groups (77% and 80% respectively, p>0.05).

This study also showed that even though this population is at high-risk for HPV infection (given their high-risk sexual practices and high prevalence of genital warts), they had a low perceived susceptibility to HPV-related cancers and genital warts. Their reported perceived susceptibility is in alignment with findings regarding the low knowledge of HPV infection within men in this STI clinic, in which fewer than 15% had an adequate knowledge of HPV infection and its long-term consequences (15). Our study also showed that none of the study participants have been vaccinated against HPV. Given their high-risk sexual practices, this group and their sexual partners would benefit from HPV vaccination. However, given the small sample size, caution with the interpretation of the findings is warranted. Future studies with a larger and more representative population sample are needed to identify predictors of uptake of the HPV vaccine among different male sub-groups, including MSM and HIV positive men. This will assist in the development of tailored interventions to increase STI and cancer prevention efforts in Puerto Rican men.

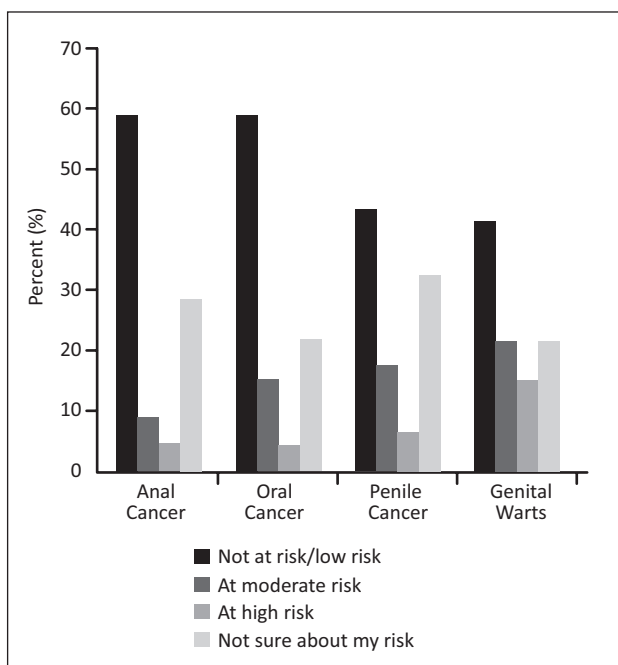


Figure 1. Perceived susceptibility to HPV related morbidities among a sample of men aged 18 to 26 years attending an STI clinic in PR, 2009-2010 (n=46).

Resumen

Objetivo: Una de las vacunas contra el VPH ha sido aprobada para hombres entre las edades de 9 a 26 años en los EU para la prevención de verrugas genitales y cáncer anal. El objetivo de este estudio es describir el 1) conocimiento sobre la vacuna contra el VPH, 2) la intención en vacunarse contra el VPH y 3) la susceptibilidad percibida hacia cánceres relacionados a VPH y

verrugas genitales en hombres de 18 a 26 años que asisten a una clínica de enfermedades de transmisión sexual (ETS) en San Juan, Puerto Rico. **Métodos:** Se realizó un estudio piloto transversal que consistió de 206 hombres VIH+/VIH-. Para efectos de este análisis, sólo fueron incluidos aquellos participantes \leq 26 años (n=46). **Resultados:** Ninguno de los participantes del estudio había sido vacunado contra el VPH. Menos de un tercio conocía sobre la vacuna contra VPH (28.3%). Sin embargo, más de la mitad (76.9%) estaban dispuestos a ser vacunados contra el VPH. Las fuentes de información sobre la vacuna contra el VPH incluyeron sus parejas sexuales femeninas (13.0%), una pareja sexual femenina que haya recibido la vacuna (8.7%) y una pareja sexual masculina (2.2%). La mayoría de los participantes reportó que la razón principal que podría aumentar su disposición a ser vacunado era si un médico se lo recomendaba (95.7%). La susceptibilidad percibida fue baja, particularmente para cáncer anal y oral. **Conclusión:** Este estudio piloto demuestra el pobre conocimiento sobre la vacuna contra el VPH en esta población, aunque el interés en vacunarse fue alto entre aquellos que conocían sobre la vacuna. Futuros estudios deben realizarse para evaluar esta paradoja y estudiar a profundidad la intención y las barreras para la vacunación entre sub-grupos masculinos, tales como en los hombres que tienen sexo con hombres (HSH). Estos estudios deben también evaluar factores que predicen la vacunación contra el VPH, tanto en hombres que asisten a ésta y otras clínicas de ETS en PR, para poder así desarrollar intervenciones que aumenten la vacunación masculina.

Acknowledgments

This project was fully supported by NIH R03 DA027939-01 and AIDS-Science Track Award for Research Transition A-START 1R03DA031590-01 from NIDA. The manuscript's contents are solely the responsibility of the authors and do not necessarily represent the official view of the sponsors.

References

1. Katz ML, Krieger JL, Roberto AJ. Human papillomavirus (HPV): college male's knowledge, perceived risk, sources of information, vaccine barriers and communication. *J Mens Health* 2011;8:175-184.
2. Dunne EF, Nielson CM, Stone KM, Markowitz LE, Giuliano AR. Prevalence of HPV infection among men: A systematic review of the literature. *J Infect Dis* 2006;194:1044-1057.
3. Gillison ML, Chaturvedi AK, Lowy DR. HPV prophylactic vaccines and the potential prevention of noncervical cancers in both men and women. *Cancer* 2008;113:3036-3046.
4. Stupiansky NW, Alexander AB, Zimet GD. Human papillomavirus vaccine and men: what are the obstacles and challenges? *Curr Opin Infect Dis* 2012;25:86-91.
5. Centers for Disease Control and Prevention. National and state vaccination coverage among adolescents aged 13 through 17 years – United States, 2010. *MMWR* 2011;60:1117-1123.
6. Centers for Disease Control and Prevention. Recommended Adult Immunization Schedule-United States, 2012. *MMWR* 2012;61:1-7.

7. CDC. Recommendations on the Use of Quadrivalent Human Papillomavirus Vaccine in Males – Advisory Committee on Immunization Practices (ACIP). *MMWR* 2011;60:1705-1708.
 8. Giuliano AR, Palefsky JM, Goldstone S et al. Efficacy of quadrivalent HPV vaccine against HPV Infection and disease in males. *N Engl J Med* 2011;364:401-411.
 9. Garnock-Jones KP, Giuliano AR. Quadrivalent human papillomavirus (HPV) types 6, 11, 16, 18 vaccine: for the prevention of genital warts in males. *Drugs* 2011;71:591-602.
 10. Palefsky JM, Giuliano AR, Goldstone S, et al. HPV Vaccine against Anal HPV Infection and Ana Intraepithelial Neoplasia. *N Engl J Med* 2011;365:1576-1585.
 11. Gerend MA, Barley J. Human papillomavirus vaccine acceptability among young adult men. *Sex Transm Dis* 2009;36:58-62.
 12. Clatts MC, Rodríguez-Díaz CE, García H et al. Sexually transmitted infections clinics as strategic venues for targeting high risk populations for HIV research and sexual health interventions. *P R Health Sci J* 2011;30:101-108.
 13. Questionnaire Design System. Nova Research Company. Available at: URL: <http://www.novaresearch.com/Products/qds/>
 14. Gilbert PA, Brewer NT, Reiter PL. Association of human papillomavirus-related knowledge, attitudes, and beliefs with HIV status: a national study of gay men. *J Low Genit Tract Dis* 2011;15:83-8.
 15. Colón-López V, Ortiz AP, Del Toro-Mejías LM, Baerga-Martínez A, García H. What do high risk men attending STD Clinics in Puerto Rico know about Human Papilloma Virus? *Cancer Epidemiol Biomarkers Prev* 2011;20:B84.
-