Declining Incidence of Genital Warts in a College Student Population

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Introduction

Genital warts are a common sexually transmitted disease seen in college students and sexual health clinics. Approximately 90% of external genital wart (EGW) infections are caused by HPV types 6 or 11, both of which are included in a quadrivalent HPV vaccine that was licensed in the U.S. in 2006.

Among adolescents, vaccine uptake has been disappointing. Data from the National Immunization Survey-Teen shows that vaccination coverage among adolescent girls aged 13–17 years with dose of any HPV vaccine increased from 25.1% in 2007 to 53.8% in 2012[1]. For males, the figure for ≥1dose received by 2012 was only 20.8%.

The uptake of HPV vaccine in U.S. college students not immunized before age 18 has been reported to be very low, particularly for men.

Despite the lack of high vaccine coverage in this population, a recent CDC study documented a 56% reduction in the prevalence of HPV infection in adolescent women during the period 2007–2010[2]. We were interested in knowing if similar reductions could be observed in the incidence of HPV-related disease in college students.

Using a genital wart diagnosis as a surrogate marker for infection, we tracked the incidence of disease over a six year period in a population of college students enrolled at a large public university in the Midwest.

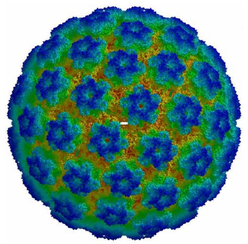
[1] Centers for Disease Control and Prevention. *Human Papillomavirus Vaccination Coverage Among Adolescent Girls, 2007– 2012*, and *Postlicensure Vaccine Safety Monitoring, 2006–2013* — United States. MMWR 2013;62:591–95.

[2] Markowitz LE, Hariri S, Lin C, et al. *Reduction in HPV prevalence among young women following vaccine introduction in the United States, National Health and Nutrition Examination Surveys, 2003–2010*. J Infect Dis 2013;208:385–93.

Materials and methods

Retrospective diagnosis data from medical visit encounters in a student health center at a large public university (2013 enrollment 43,275) were abstracted from an electronic health record system for the period January 2008 through December 2013 and stratified by year. Incident cases were counted when a genital wart diagnosis (ICD9 078.11) was coded by a provider for the given patient. Only the first incident case for each patient in a calendar year was included in our analysis; duplicate diagnoses at the same or subsequent visits by the same patient during the year were excluded.

Incident case data from 2006 was used for baseline comparison. Changes in disease incidence were compared with HPV vaccination history reported by entering students during this same period. IBM SPSS Statistics version 20 software was used to conduct all analyses. Categorical variables and proportions were compared using standard Chi square tests. Annual incidence rates were compared using a Chi square test for linear trend.



Atomic model of the Human Papillomavirus
RASMOL Image ©2005 by Jean-Yves Sgro, Images: www.bocklabs.wisc.edu

Figure 1

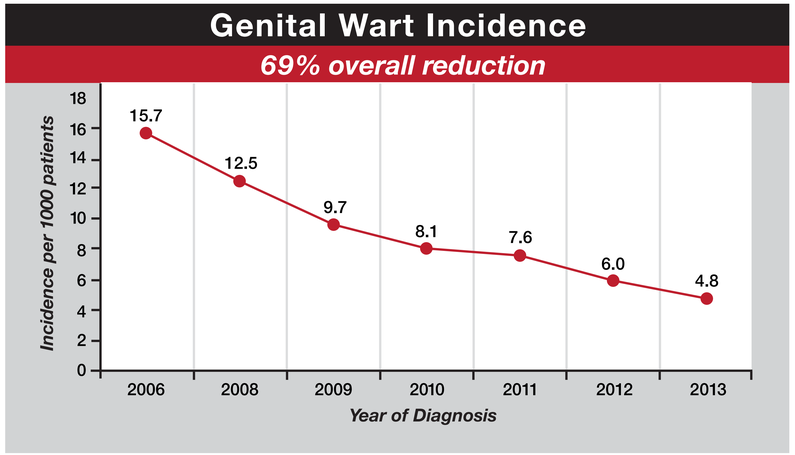
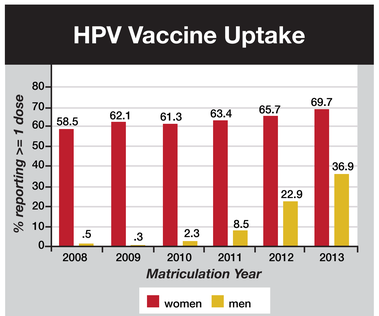


Figure 2

EGW Incidence by Gender
(cases per 1000 patients)

Year	Female	Male
2006	*10.8*	*26.0*
2008	7.0	22.1
2009	6.3	15.2
2010	4.4	14.4
2011	4.4	13.0
2012	3.0	10.9
2013	2.6	8.4
reduction	***75.7%***	***67.6%***

Figure 3



Results

Overall, the proportion of patients diagnosed with genital warts in the health center declined by 69.0% between 2006 and 2013, from 1.3% (n=222) to 0.5% (n=88) of medical patients seen annually (p<.0001).

Incidence per 1000 students declined progressively each year between 2008 and 2013 (p<.0001 for linear trend), (figure 1). The reduction in incidence compared to the 2006 baseline was similar in women (75.7%) and men (67.6%) despite large differences in vaccination rates over this period (figure 2).

Among students entering the university between 2008 and 2013, 64.0% of women and 14.7% of men reported prior receipt of one or more doses of HPV vaccine (cumulative). Rates of vaccine completion increased each year between 2006 and 2013 (figure 3).

Conclusions

These data demonstrate striking decreases in the incidence of genital wart diagnoses in a population of college students after the introduction of a quadrivalent HPV vaccine in the United States. Declines occurred rapidly over seven years in this population of sexually active young adults, despite less than optimal levels of vaccine coverage.

As rates of immunization increased for women who entered college after 2006, some cross protection for male partners was apparent as well. Incidence in men was observed to decrease even before a recommendation for vaccination of males was in place.

Colleges and universities should continue to promote and provide HPV vaccine to their students to achieve further reductions in disease incidence.

Limitations

The data presented are derived from an ecological analysis and a causal relationship between increasing vaccination rates and declining incidence can be considered but not proven. Data on individual HPV vaccination history in students with an EGW diagnosis was not available. Patients diagnosed with genital warts in other settings would not be known to us and thus incidence data does not necessarily reflect all cases of disease in the study population.

Further Information

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