An examination of HPV vaccination and cervical cancer screening using a local survey and the National Health Interview Survey

Monica L. Kasting, Terrell W. Zollinger, DrPH, Brian E. Dixon, MPA, PhD, Nathan W. Stupiansky, PhD, Gregory D. Zimet, PhD

INDIANA UNIVERSITY

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Background

- Human Papillomavirus (HPV) is one of the most common STIs in the world.
- The World Health Organization lists it as the causal factor in the etiology of cervical cancer.
- The Centers for Disease Control and Prevention estimates there are 79 million new HPV infections in the U.S. each year.

(CDC, 2014; Forman, et al., 2012)

Background

- Three different vaccines against HPV are currently licensed by the FDA:
  - Cervarix (Types 16, 18)
  - Gardasil (Types 6, 11, 16, 18)
  - Gardasil 9 (Types 6, 11, 16, 18, 31, 33, 45, 52, 58)
- ACIP recommendation:
  - Girls and boys 11-12
  - Girls up to age 26
  - Boys up to age 21

(CDC, 2010; CDC, 2012; FDA, 2014)

Background

- There exist concerns that HPV vaccination could result in women perceiving they are protected from all cervical cancers, leading to decreased screening rates.
- Compared to sexual disinhibition, there has been less research conducted on cervical cancer screening behavior post-HPV vaccination.
- Preliminary studies have shown that vaccinated women do not have lower intent to get screened but most women are unaware of screening guidelines.

(Mather, 2012; Williams, 2013; Anhang Price, 2011; Caskey, 2009)

Background

- Cervical cancer screening guidelines have changed four times in the last 30 years and the most recent recommendations have only been in place since 2012.
- The current recommendations for average risk women state:
  - Women should get screened with a Pap test every three years from age 21-29.
  - From age 30-65 women should be screened with a Pap test as well as HPV DNA test every five years.
  - Screening is not recommended after age 65.

(ACS, 2014; CDC, 2012)

Study Aims

- This study examined the relationship between cervical cancer screening rates and HPV vaccination in a nationally representative sample of women in the United States.

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Differential uptake of recent Papanicolaou testing by HPV vaccination status among young women in the United States, 2008–2013

Ann Goding Sauer [a,*], Ahmedin Jemal [a], Edgar P. Simard [b], Stacey A. Fedewa [a,b]

[a] Surveillance and Health Services Research Program, Intramural Research Department, American Cancer Society, 250 Williams Street, Atlanta, GA 30303-1002, United States

[b] Epidemiology Department, Emory University, 1518 Clifton Road NE, Atlanta, GA 30322, United States

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ABSTRACT

Background: A positive association between recent Papanicolaou (Pap) test uptake and initiation of HPV vaccination among U.S. women has been reported. However, it is unknown whether recent Pap testing by HPV vaccination status varies by race/ethnicity. Discerning racial/ethnic variations is important given the higher prevalence of HPV types other than 16 and 18 in some racial/ethnic groups. We assessed whether uptake of recent Pap testing differed among women aged 21–30 years who had not initiated the HPV vaccination series versus those who had and whether this pattern differed by sociodemographic factors.

Methods: 2008, 2010, and 2013 National Health Interview Survey data were used to generate weighted prevalence estimates and 95% confidence intervals (CIs) (n = 7095). Adjusted predicted marginal models were used to generate adjusted prevalence ratios (aPRs) to assess the relationship between recent Pap test uptake and HPV vaccination series initiation by race/ethnicity.

Results: The uptake of recent Pap testing among those who had not initiated the HPV vaccination series was significantly lower (81.0%) compared to those who had initiated vaccination (90.5%) (aPR = 0.93, 95% CI: 0.90–0.96). This finding was consistent across most sociodemographic factors, though not statistically significant for Blacks, Hispanics, those with lower levels of education, or those with higher

Study Aims

- To examine the relationship between cervical cancer screening rates and HPV vaccination in a nationally representative sample of women in the United States.
- To examine the relationship between cervical cancer screening rates and HPV vaccination in a local survey of minority women.
- To expand on these findings and examine attitudes and beliefs surrounding screening behaviors.

2014 NHIS

Methods

- We analyzed data from the 2014 National Health Interview Survey (NHIS) for women between the ages of 21 and 34 (i.e., born between 1980 and 1993).
  - Excluded:
    - Women who reported a history of cervical cancer
    - Those who had received the vaccine less than 12 months prior to the survey.
- Logistic regression was used to assess the relationship between having one or more HPV vaccine doses and the odds of having had a Pap test in the past 12 months.

2014 NHIS

Sample Description

- 4,527 women were included in the study.
- Mean age was 27.9 years old (SD=3.9).
- Race:
  - 53% were non-Hispanic white
  - 15% were non-Hispanic black
  - 8.5% were non-Hispanic other
  - 23% were Hispanic.
- Marital status:
  - 49% indicated they were in a monogamous relationship (either married or living with a partner)
  - 51% indicated they were single (divorced/widowed/separated/never married/unknown).

2014 NHIS

Results

- 24% of the women indicated they had received at least one HPV vaccine.
- 61% had a Pap test within the past 12 months.
- Women who had been vaccinated had **greater odds** of having a Pap test in the past 12 months **(OR=1.7; 95%CI=1.5-2.0; p<0.001).**
- This relationship was still significant in an adjusted multivariable logistic regression **(AOR=1.9; 95%CI=1.6-2.2; p<0.001)** while controlling for independently statistically significant covariates age, race, and marital status.

Local Minority Survey

Sample Description

- 291 women were included in analysis.
- Ages ranged from 21 to 35 with a mean of 28.5 (SD=4.7).
- Race:
  - 63% were non-Hispanic black
  - 23% were non-Hispanic white
  - 15% were Hispanic, other, or multiracial
- 84% of the women in the study received a Pap test in the last three years
- 33% had received at least one HPV vaccination.

Local Minority Survey

Sample Description by Cervical Cancer Screening Status (Current vs. Not Current)

	Total Sample (n=291)	Current (n=245)	Not Current (n=46)	Bivariate analysis p-value
Mean Age	28.5	29.1	25.3	<0.001*
Race				0.004*
Non-Hispanic White	22.7%	22.9%	21.7%	
Non-Hispanic Black	62.5%	65.3%	47.8%	
†Other	14.8%	11.8%	30.4%	
Education				0.112
Some high school/high school graduate/GED	12.0%	11.0%	17.4%	
Some college/trade school/4-year degree	52.9%	55.5%	39.1%	
Some post-grad/ graduate degree	35.1%	33.5%	43.5%	
HPV Vaccine Status				0.497
Received >=1 dose	33.3%	34.3%	28.3%	
Never received HPV vaccine or unsure	66.7%	65.7%	71.7%	
*Significant at p<0.05				

Local Minority Survey

Regression Analyses Assessing the Receipt of a Pap Test in the Last Three Years Controlling for Demographic Variables

	Logistic Regression Odds Ratio (95% CI)
Ever received HPV vaccine	
No	Ref
Yes	3.06 (1.37-6.83)*
Race	
Non-Hispanic White	Ref
Non-Hispanic Black	0.94 (0.39-2.27)
Other	0.30 (0.11-0.82)*
Age (continuous)	1.26 (1.15-1.38)*

*Significant at $p<0.05$

†These variables were not significant in the bivariate analysis and were subsequently excluded from multivariable regression model.

Local Minority Survey

Results

- When asked how often a woman should get a Pap test if she has never had cervical cancer or an abnormal Pap test:
  - 64% incorrectly said they thought she should get screened every year
- Women were then told the current recommendation for average risk women is every three years and then were asked if they were previously aware of this.
  - 45% said they were aware of this recommendation.
  - 24% of the total sample indicated both that they knew the recommendation was every three years, but still stated the women should get screened every year.

Local Minority Survey

Results

- When asked on a five-point scale how comfortable they are with the new screening recommendations:
  - 43% indicated they were either very or somewhat uncomfortable
  - 40% said they were either very or somewhat comfortable
  - 18% indicated they were neither comfortable nor uncomfortable

Discussion

Limitations

- NHIS:
  - Only had Pap testing data for the last 12 months
- Local survey:
  - Convenience sample
- Both:
  - Vaccination and Pap testing status were self-report

Discussion

- The Sauer *et al.* article, analysis of the 2014 NHIS data, and the local minority survey all agreed…
- No relationship between vaccination status and subsequent cervical cancer screening behaviors

-OR-

- Women who have been vaccinated have greater odds of screening.

Conclusion

- Women are not unaware of current recommendations but rather that they are uncomfortable with them.
- Current recommendations might not be carried out in clinical practice.
- There was a positive relationship between vaccination and cervical cancer screening when adjusted for age and race.
- This is largely consistent with research that has looked at risk compensation with regards to sexual behaviors.

(Kasting, 2016)

Conclusion

- These results may be explained by the fact that both vaccination and screening are pro-health behaviors.
- Risk compensation due to HPV vaccination does not occur and in fact, it appears as if **the opposite is occurring**.
- The findings should alleviate concerns among healthcare providers regarding a decrease in cervical cancer screening due to HPV vaccination.

Thank You