

Abused Women at Risk for HPV and Cervical Cancer: Decisions to Vaccinate their Children

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Received date: July 22, 2015; Accepted date: October 5, 2015; Published date: October 15, 2015

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Abstract

Women who have experienced intimate partner violence (IPV) are at high risk for many bio-psycho-social health problems, including *Human papillomavirus* (HPV) infection and subsequent cervical cancer. HPV vaccines are effective in eliminating the majority of cervical cancers when administered to both boys and girls at 11 or 12 years of age before becoming sexually active. The purpose of this study was to examine the knowledge and utilization of the HPV vaccine by a group of abused women and their intent to vaccinate their children. Study participants were 280 English and Spanish-speaking women and one of their children engaged in a larger, overarching, 7-year study to determine long-term health and functioning outcomes of abused women and their children. The descriptive data presented here were collected at the 44-month interview. Eight of the women had a diagnosis of cancer. Most of the women (75%) indicated they had some knowledge of the vaccine. Of the women with children over 11 years of age, 53 (45%) have not had their children vaccinated for HPV. In the group of 147 women with children 11 years old or younger, 47 (32%) do not intend to have their children vaccinated. Decision to not vaccinate was attributed to decreased accessibility, poverty, indecisiveness, fear of complications, moral issues, and lack of provider recommendation. It is important that policy makers, health care providers, and the general public receive accurate, unbiased, and detailed information regarding HPV, its health consequences, and the newest vaccines available to maximize the health of our global society. Universal access to the HPV vaccines for all prepubescent children is less costly than the long-term expense incurred by a rising HPV-related cancer incidence. Women in abusive relationships should be screened regularly for HPV and cervical cancer and provided with information about vaccinating their children.

Key words:

Intimate partner violence; Abused women; Domestic violence; *Human papillomavirus*; HPV vaccine; Cervical cancer; Cancer screening

Introduction

It is well-known that women who have experienced intimate partner violence (IPV) are at high risk of acquiring a host of acute and chronic bio-psycho-social maladies [1] and parenting challenges [2]. This paper will focus on the high incidence of *Human papillomavirus* (HPV) infection and subsequent cervical cancer risk that occurs amongst abused women, especially those experiencing sexual partner abuse. HPV vaccines are effective eliminating the majority of cervical cancers. The vaccines offer the best protection when administered to preteen girls and boys at age 11 or 12 years [3]. Women's knowledge of the benefits of the HPV vaccine is linked to improved health of women and their children. Because of the cyclic nature and intergenerational effects of family violence, children in these households are at higher risk for a variety of negative behavioral and health outcomes [4]. It is plausible that children of IPV families are less likely to receive HPV vaccines. The purpose of this study was to examine the knowledge and utilization of the HPV vaccine in a group of abused women and their intent to vaccinate their children.

The Global Problem of HPV and Cancer

Cervical cancer is commonly associated with positive HPV test and abnormal Papanicolaou (Pap) testing results, but anal, vulvar, vaginal, penile, and oropharyngeal cancers are also linked to HPV and cervical pathology. Reports indicate that, worldwide, 527,624 women are diagnosed with cervical cancer each year and 265,653 die from the disease [5]. The incidence of anal cancer is increasing with an estimated 27,000 new cases globally each year [6]. Women who have been diagnosed with cervical or vulvar cancers, as well as those who are immunocompromised, are especially susceptible to developing anal cancer. Genital warts and juvenile respiratory papillomatosis are commonly associated with HPV types 6 and 11.

There is overwhelming evidence that HPV is associated with early age of first sexual activity, engagement in sex with multiple partners, and lack of condom use [7]. There are an estimated 180 distinct varieties of the double-stranded DNA viruses broadly referred to as HPV. These viruses have been linked to benign and malignant skin and squamous mucosae lesions producing both low-risk lesions such as genital warts (e.g., HPV 6 and 11) and high risk cancerous tumor growth (e.g., HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56 and 58) [8]. Nearly 100% of cervical cancer diagnoses are attributed to HPV with HPV types 16 and 18 accounting for 70% of all cervical cancer cases worldwide. HPV types are 31, 33, 35, 45, 52 and 58 are responsible for an additional 20% of cervical cancer cases [9].

HPV-Related Cancer Risk in Abused Women

Abused women are at risk of having abnormal Pap test results and testing positive for HPV, both known to be associated with an increased incidence of cancers that disproportionately affect women. It has been estimated that the rates of cervical cancer amongst abused women may be as much as ten times greater than in the general population [1]. Research has shown that chronic stress, depression, lower self-efficacy, smoking, multiple intimate partners, sexual abuse, and childhood physical abuse are contributing factors leading to the higher incidence of cancer amongst adult women who report abuse [10]. Abused women are less likely to schedule routine health screening, have a primary care provider with whom they have an established long-term relationship, and may have increased avoidance behaviors related to gynecological care if sexual abuse has occurred [11]. While death rates from cancer in general are declining, the incidence of HPV-associated cancers, especially cervical, oropharynx and anus cancers continue to rise [12]. Additionally, women in abusive relationships do not fare as well after a cancer diagnosis has been made. These women tend to score lower on functional and general well-being assessments and higher on tests of stress and depression when beginning a cancer treatment regimen [13,14].

HPV Vaccine Effectiveness in Preventing Cervical Cancer

There are two Food and Drug Administration (FDA) approved vaccines in the United States (US) to prevent HPV infection. These vaccinations, Gardasil® and Cervarix®, have demonstrated effectiveness against 4 types of HPV in significantly reducing cervical pathology and cancer (types 16 and 18) and eliminating 90% genital warts (types 6 and 11). Originally proposed for pre-pubescent girls, the HPV vaccine is currently recommended for both females 9–26 years of age and males 9-21 years of age [15], preferably administered prior to becoming sexually active. Vaccination of boys was determined to be essential in promoting the health of girls and women due of transmission via heterosexual contact [16].

Recently, the FDA announced the release of Gardasil9® (Human Papillomavirus 9-valent Vaccine, Recombinant) vaccine that will be effective against 9 HPV types. In addition to the 4 previously discussed HPV types, the new vaccine also covers types 31, 33, 45, 52 and 58

potentially protecting women against more than 90% of cervical, oropharyngeal, vulvar, vaginal, and anal cancers. Standard treatment includes three doses administered over six months, but a one or two dose recommendation is now being considered which may improve vaccine acceptability and compliance [17].

Study Methods and Sample

English and Spanish-speaking women in this study were participants in an on-going seven-year prospective study that is following 300 abused women and one of their children to determine long-term health and functioning outcomes of abused women and their children after they seek assistance to end the violence. In 2011, women reaching out for assistance via sheltered housing (n=150) and the District Attorney's office in the Houston area (n=150) were recruited to participate in the prospective, seven-year, longitudinal study. Following appropriate institutional review processes and consenting procedures, English and Spanish-speaking women agreed to be interviewed every 4 months for 7 years by bi-lingual data collectors.

The data for the study presented here were collected from 280 women (90.33% retention rate) at the 44-month interview conducted in their preferred language. Eight of the women had personally received a diagnosis of cancer (6 of the 8 with cervical cancer). (Table 1) Questions regarding the HPV vaccine asked of study participants at the 44-month interview included:

- Do you know about the vaccine for human papilloma virus (HPV)?
- Do you have a child(ren) 11 years old or older?
- If YES to knowing about vaccine and YES to child(ren) 11 yrs or older, HAS your child(ren) received the vaccine?
- If YES to knowing about vaccine and child(ren) less than 11yrs, do you plan to have child(ren) receive vaccine?
- If yes to knowing about vaccine and you did not (or do not plan) to have your child(ren) receive the HPV vaccine, Why not?
- 1=Cannot Afford; 2=No insurance/health provider; 3=Morals/religion; 4=Fear; 5=Other

Do you know about the vaccine for HPV?	n	%
No	70	25.0%
Yes	210	75.0%
Total	280	
Do you have a child(ren) 11 years old or older?		
No	127	45.4%
Yes	152	54.3%
Missing	1	0.4%
Total	280	
If YES to knowing about vaccine and YES to child(ren) 11 yrs or older, HAS your child(ren) received the vaccine?		
No	53	45.3%
Yes	64	54.7%

Total	117	
If YES to knowing about vaccine and child(ren) less than 11yrs, do you plan to have child(ren) receive vaccine?		
No	47	32.0%
Yes	100	68.0%
Total	147	
If yes to knowing about vaccine and you did not (or do not plan) to have your child(ren) receive the HPV vaccine, Why not?		
No Insurance	4	4.9%
Morals	2	2.4%
Fears	28	34.1%
Other	48	58.5%
Total	82	

Table 1: Frequencies and percentages of survey questions.

Findings

The majority of study participants had general knowledge of the vaccine with 75% (n=210) of the women indicating that they have heard of the vaccine. Of the women who had general knowledge of the vaccine and had a child over the age of 11 (n=117), 53 (45%) of the women indicated they have not, to date, had their children vaccinated for HPV. In the group of 147 women with children 11 years old or younger and knew about the vaccine, 47 (32%) do not intend to have their children vaccinated. Women who indicated they were aware of the vaccine and have not, or do not plan to, vaccinate their children (n=82) were also asked the reason for this decision. Responses to not vaccinate were related to accessibility (no insurance, lack of money or transportation, unable to get off of work, no primary care provider), indecisiveness (haven't gotten around to it, haven't made up my mind yet, want to think about it more, have mixed feelings), fears of side effects or complications (34%), moral grounds (2.4%), and lack of provider recommendation. A summary of study findings can be found in Table 1.

Discussion

While this study found that 25% of the participants had no knowledge of the HPV vaccine, this statistic may be lower than that of the general population. Other researchers have found that upwards toward 50% of parents of adolescents had little or no knowledge of the HPV infection or vaccine [18,19]. Because abused women have a higher incidence of sexually transmitted infections (STIs) and the women in this study had high rates of preventative health care utilization, they may have been better informed about HPV infection and the vaccine than the general population.

It has also been noted that there are gender differences in the level of knowledge, health beliefs, and behavioral intentions to prevent infection between men and women [20]. Such differences may in turn impact the HPV vaccination rates among adolescents. Because the sample for this study included only women who had experienced IPV, these differences could not be assessed.

In 2010, the US Healthy People 2020 target was for 80 % of adolescents females to receive three doses of HPV vaccine by their 13th

birthday [21]. To date, this target has not yet been achieved [22]. HPV4, the quadrivalent HPV vaccine, was not approved for use in 9 to 26-year-old males in the US until 2009. The Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP) issued a recommendation that males be vaccinated beginning in 2011. Globally, the rate of HPV vaccination for males is consistently lower than vaccination rates for females [23].

At the time of the interview, slightly more than half (54.7%) of the studied women indicated they had their children receive at least one dose of the HPV vaccine. This is similar to the reported rates in the general US population where 53% of females aged 13–17 years had received at least one dose and 34.8% had received all three of the recommended doses [24]. This same report indicates that HPV vaccination series initiation rates were higher for adolescent females who were black, Hispanic, or living below the poverty level, but completion of the series was lower when compared to white adolescent females from higher socio-economic status families. The majority of the women in the current study were of an ethnic minority, primarily Hispanic, and lived in poverty. It is likely that adolescents living in higher income families would more likely to have the resources such as transportation, a regular health care provider, and health care insurance that mitigate barriers to receiving all health care services.

Amongst the 147 abused women in the study who had children 11 years old or younger, 47 (32%) had clear intentions to not have their children vaccinated. This is consistent with US statistics reported by the CDC showing that only 37.6% of teenage girls and 13.9% of teenage boys received all three recommended doses of the vaccine in 2013 [25]. Vaccination rates are slightly higher in other highly-resourced countries [26], but much lower in the developing world with wide variation in vaccine use based on geographic and demographic variables. The inverse correlation between vaccine initiation and cervical cancer incidence and mortality is notable [27].

The reasons given by the current study participants for the underutilization of the HPV vaccine are multifaceted and similar to those suggested by other studies [18,19]. One of the most commonly cited barriers for lack of vaccination is the inability pay for health care services and decreased access to care [28]. In the current study, only 4.9% of the women indicated that lack of insurance was a barrier.

Because of poverty and the instability of living conditions of women who are experiencing IPV, transportation, inability to get off of work and other accessibility issues clearly play a role. It is a global phenomenon that socio-economically marginalized girls and women experience disproportionately higher rates of most diseases and utilize health care services more frequently.

Respondents in the current study (2.4%) indicated that they declined HPV vaccination of their children based on moral grounds and another 34.1% said they feared side effectors or complications related to the vaccine. The media is filled with special interest groups stating their opposition or support for policy development related to mandatory administration of the HPV vaccine [29]. Concerns about safety and efficacy of HPV vaccines have been expressed. There is the perception by some that pharmaceutical companies might be influencing health care policy for financial gain. When the vaccines were first introduced in 2006, religious and conservative groups expressed concern that widespread use of the HPV vaccine would condone and promote sexual promiscuity amongst adolescents, but recent research does not support this stance [30].

This study and others revealed the distressing finding that one of the most common reasons for not choosing to vaccinate adolescents for HPV is the lack of provider recommendation [31]. This suggests that awareness on the part of the primary health care provider regarding the benefits of the HPV vaccine needs to be increased. This, coupled with the lack of information on the part of the parent and the adolescent that precludes them requesting the vaccine, appears to be a barrier compliance with vaccination compliance [32]. Increasing awareness within the community regarding the benefits of vaccination will better inform the health consumers and enable them to be more proactive in requesting the HPV vaccines.

Recommendations for Healthcare Providers

The political environment and health care infrastructure within a country, gender disparities, ethical issues, dictates of religion, and individual preferences have led to public debates of the policies surrounding the administration of the HPV vaccines. When the population being served includes impoverished women who have experienced partner violence, there is an added dimension of social and cultural stigma and obstacles. Pap testing is universally accepted as important in the earlier detection and treatment of cervical cancer and should be recommended for women at risk for STIs and sexual abuse. The latest recommendations include concurrent or separate testing for HPV. Fairly new on the market are HPV DNA self-testing kits which offer a feasible alternative to Pap testing [33]. These kits have the potential to improve screening for cervical cancer in women who have decreased access to health care services or those who may be avoiding Pap testing due to anxiety related to prior abuse. Adding the HPV vaccine to the national immunization schedule and a reduction of cost in the cost of the vaccine could significantly increase vaccination frequency and compliance [34].

Initiating a patient/provider dialogue on the topic of sexual health at an early age, prior to puberty and the first sexual encounter, is an important component of care and may be overlooked or avoided. Adolescent sexual behavior is generally unpredictable. Therefore, education that increases awareness of HPV as an STI, specifies behaviors associated with STI prevention, and highlights the benefits of vaccination is recommended [35].

Conclusion

It is currently well-documented that HPV is associated with cervical and other cancers which are major causes of women's mortality and morbidity globally. This evidence has resulted in a paradigmatic shift in cervical cancer prevention from educating adult women about high risk behaviors to immunizing pre-pubescent children. We have the pharmacologic means to prevent this deadly infection and its associated suffering through administration of currently existing vaccines. Universal access to the HPV vaccines might appear to be costly, but the long-term expense incurred by a rising HPV-related cancer incidence is even higher [36]. In the US alone, the yearly cost of cervical cancer care and other HPV-associated health outcomes are estimated to total eight billion US dollars [37].

It is essential that all policy makers, health care providers, and the general public receive accurate, unbiased, and detailed information regarding HPV, its health consequences, and the newest vaccines available to maximize the health of our global society. Special attention should be given to women with children who have disclosed violence in the home. Higher rates of HPV vaccination in this population may be effective in eliminating one potentially lethal condition faced by families affected by physical and sexual abuse.

Acknowledgement

We appreciate the unflagging assistance and support of the administrators and staff of the five shelters in Harris County and the Chief and staff of The Harris County District Attorney's Office, Family Criminal Law Division. The 300 women and children who allowed us to record their pain and recovery took emotional risks each time we met. As one woman said, "I want to talk but it hurts to remember." We thank each woman who chose to remember and dedicate the findings of this research to her courage and determination. In addition, we acknowledge funding by The Houston Endowment.

References

1. Cesario SK, McFarlane J, Nava A, Gilroy H, Maddoux J (2014) Linking cancer and intimate partner violence: the importance of screening women in the oncology setting. Clin J Oncol Nurs 18: 65-73.
2. Fredland N, McFarlane J, Gilroy H, Nava A, Paulson R, et al. (2015) Connecting partner violence to poor functioning for women and children: modeling intergenerational outcomes. J Fam Violence 30: 555-566.
3. CDC (2015) *Human papillomavirus (HPV): HPV Vaccines*.
4. Blair F, McFarlane J, Nava A, Gilroy H, Maddoux J (2015) Child Witness to Domestic Abuse: Baseline Data Analysis for a Seven-Year Prospective Study. Pediatr Nurs 41: 23-29.
5. Bruni L, Barrionuevo-Rosas L, Albero G, Aldea M, Serrano B, et al. (2014) *Human Papillomavirus and Related Diseases in the World*. Summary Report.
6. de Martel C, Ferlay J, Franceschi S, Vignat J, Bray F, et al. (2012) Global burden of cancers attributable to infections in 2008: a review and synthetic analysis. Lancet Oncol 13: 607-615.
7. International Collaboration of Epidemiological Studies of Cervical Cancer (2007) Comparison of risk factors for invasive squamous cell carcinoma and adenocarcinoma of the cervix: collaborative reanalysis of individual data on 8,097 women with squamous cell carcinoma and 1,374 women with adenocarcinoma from 12 epidemiological studies. Int J Cancer 120: 885-891.
8. Rosales R, Rosales C (2014) Immune therapy for human papillomaviruses-related cancers. World J Clin Oncol 5: 1002-1019.

9. Clifford G, Franceschi S, Diaz M, Muñoz N, Villa LL (2006) Chapter 3: HPV type-distribution in women with and without cervical neoplastic diseases. *Vaccine* 24: S26-34.
10. Yoshihama M, Horrocks J, Bybee D (2010) Intimate partner violence and initiation of smoking and drinking: A population-based study of women in Yokohama, Japan. *Soc Sci Med* 71: 1199-1207.
11. Ackerson K (2012) A history of interpersonal trauma and the gynecological exam. *Qual Health Res* 22: 679-688.
12. Jemal A, Simard E, Dorell C, Noone A, Markowitz L (2013) Annual report to the Nation on the Status of cancer, 1975–2009, Featuring the Burden and trends in Human Papillomavirus (HPV)–Associated cancers and HPV Vaccination coverage levels. *J Natl Cancer Inst* 105: 749-750.
13. Coker AL, Follingstad D, Garcia LS, Williams CM, Crawford TN, et al. (2012) Association of intimate partner violence and childhood sexual abuse with cancer-related well-being in women. *J Womens Health (Larchmt)* 21: 1180-1188.
14. Thananowan N, Vongsirimas N (2014) Factors Mediating the Relationship Between Intimate Partner Violence and Cervical Cancer Among Thai Women. *J Interpers Violence* 4: 15-30.
15. CDC (2015b) Cancer prevention and control: Vaccination.
16. Lehtinen M, Apter D, Baussano I, Eriksson T, Natunen K, et al. (2015) Characteristics of a cluster-randomized phase IV *human papillomavirus* vaccination effectiveness trial. *Vaccine* 33: 1284-1290.
17. FDA (2014) FDA News Release: FDA approves Gardasil 9 for prevention of certain cancers caused by five additional types of HPV, December 10, 2014.
18. Fernández ME, Le YL, Fernández-Espada N, Calo WA, Savas LS, et al. (2014) Knowledge, attitudes, and beliefs about *Human Papillomavirus* (HPV) vaccination among Puerto Rican Mothers and daughters, 2010: a qualitative study. *Prev Chronic Dis* 11: 140171.
19. Staras SA, Vadaparampil ST, Patel RP, Shenkman EA (2014) Parent perceptions important for HPV vaccine initiation among low income adolescent girls. *Vaccine* 32: 6163-6169.
20. Kim HW (2013) Gender differences in knowledge and health beliefs related to behavioral intentions to prevent human papillomavirus infection. *Asia Pac J Public Health* 25: 248-259.
21. US Department of Health and Human Services (2015) Healthy people 2020. Washington, USA.
22. McKeever AE, Bloch JR, Marrell M (2015) Human papillomavirus vaccination uptake and completion as a preventive health measure among female adolescents. *Nurs Outlook* 63: 341-348.
23. Alexander AB, Best C, Stupiansky N, Zimet GD (2015) A model of health care provider decision making about HPV vaccination in adolescent males. *Vaccine* 33: 4081-4086.
24. Curtis CR, Dorell C, Yankey D, Jeyarajah J, Chesson H, et al. (2014) National Human Papillomavirus Vaccination Coverage Among Adolescents Aged 13-17 Years, National Immunization Survey - Teen, United States, 2011 MMWR Morb Mortal Wkly Rep 63: 61-70.
25. National Center for Immunization and Respiratory Diseases (2014) Teen vaccination coverage: HPV Vaccine National Center for Immunization and Respiratory Diseases (2011) General recommendations on immunization --- recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 60: 1-64.
26. Sadler L, Roberts SA, Hampal G, McManus D, Mandal D, et al. (2015) Comparing risk behaviours of *human papillomavirus*-vaccinated and non-vaccinated women. *J Fam Plann Reprod Health Care* 41: 255-258.
27. Moss JL, Reiter PL, Brewer NT (2015) Correlates of *human papillomavirus* vaccine coverage: a state-level analysis. *Sex Transm Dis* 42: 71-75.
28. Graham JE, Mishra A (2011) Global challenges of implementing *human papillomavirus* vaccines. *Int J Equity Health* 10: 27.
29. Abiola SE, Colgrove J, Mello MM (2013) The politics of HPV vaccination policy formation in the United States. *J Health Polit Policy Law* 38: 645-681.
30. Ramírez M, Jessop AB, Leader A, Crespo CJ (2014) Acceptability of the human papillomavirus vaccine among diverse Hispanic mothers and grandmothers. *Hisp Health Care Int* 12: 24-33.
31. Donahue KL, Stupiansky NW, Alexander AB, Zimet GD (2014) Acceptability of the human papillomavirus vaccine and reasons for non-vaccination among parents of adolescent sons. *Vaccine* 32: 3883-3885.
32. Firenze A, Marsala MG, Bonanno V, Maranto M, Ferrara C, et al. (2015) Facilitators and barriers HPV unvaccinated girls after 5 years of program implementation. *Hum Vaccin Immunother* 11: 240-244.
33. Nilyanimit P (2014) Comparison of Detection Sensitivity for *Human Papillomavirus* between Self-collected Vaginal Swabs and Physician-collected Cervical Swabs by Electrochemical DNA Chip. *Asian Pac J Cancer Prev* 15: 10809-10012.
34. Tolunay O, Celik U, Karaman S, Celik T, Resitoglu S (2014) Awareness and attitude relating to the *human papilloma virus* and its vaccines among pediatrics, obstetrics and gynecology specialists in Turkey. *Asian Pac J Cancer Prev* 15: 10723-1078.
35. Niccolai L, Hansen C, Credle M, Ryan S, Shapiro E (2014) Parents' views on human papillomavirus vaccination for sexually transmissible infection prevention: a qualitative study. *Sex Health* 11: 274-279.
36. Fonseca AJ, de Lima Ferreira LC (2014) Systematic review of the cost-effectiveness of the vaccination against HPV in Brazil. *Hum Vaccin Immunother* 10: 3484-3490.
37. Chesson HW, Ekwueme DU, Saraiya M, Watson M, Lowy DR, et al. (2012) Estimates of the annual direct medical costs of the prevention and treatment of disease associated with *human papillomavirus* in the United States. *Vaccine* 30: 6016-6019.