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Cervical cancer and HPV vaccination: Knowledge and attitudes of adult women in Lusaka, Zambia

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Introduction

Of the estimated 525,000 new cases of cervical cancer and 275,000 deaths from cervical cancer in 2008, over 85% were in developing countries (1). Cervical cancer accounts for over 2.7 million years of life lost among women between the ages of 25 and 64 worldwide, 2.4 million of which occur in resource poor countries (2). Over 20% of the annual deaths from cervical cancer occur in countries in sub-Saharan Africa, such as Zambia, where it is the most common cause of cancer death among women (1). Of the women in developing countries who die of cervical cancer, fewer than 5% have ever had a screening exam for the disease (3).

Zambia has one of the highest age-standardized incidence rates of cervical cancer in Africa, estimated at 54 cases/100,000 women per year, and the associated mortality rate is 44 deaths/100,000 women per year (4). In 2006 the government implemented a cervical cancer screening program which utilizes the “see-and-treat” and visual inspection with acetic acid (VIA) model of evaluation. It has been successful, screening approximately 10,000 women per year since its inception (5). The program is expanding from the capital Lusaka into more rural provinces of Zambia. Neither of the two approved vaccines for human papillomavirus (HPV) is currently available in Zambia. Although a recent study explored common myths

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The authors declare that they have nothing to disclose.

about cervical cancer among Zambian women, no published studies have examined their attitudes regarding HPV vaccination (6).

The objectives of this study were to better understand knowledge regarding cancer and cervical cancer, to assess exposure to vaccines, and evaluate the acceptability of HPV vaccination among women in Zambia.

Methods

This cross-sectional investigation was conducted from August through September 2009 in Lusaka, Zambia. All women from the ages of 18 to 65 years of age presenting to two clinics providing general medical, antenatal, and gynecology services were eligible to participate. Every 10th woman who presented was approached by a trained research nurse to ask whether she was interested in completing a nurse-administered questionnaire. No personal identifiers were collected with the questionnaires to ensure confidentiality.

The questions were based on modified versions of questionnaires from several other studies on attitudes towards HPV vaccination (7-17). Prior to the start of the study, we conducted two focus groups with adult women presenting to both clinics to assess general knowledge about vaccines, cancer, and cervical cancer. The questionnaire was further modified and made culturally appropriate based on results from these focus groups and discussion with local healthcare providers (unpublished results).

The questionnaire collected demographic information and addressed knowledge of cancer and cervical cancer, as well as exposure to vaccines. Women were asked to answer questions regarding the vaccination of their children. If they did not have children, women answered in the hypothetical. If a participant was not aware of vaccines, subsequent questions regarding vaccination were skipped. If a participant was not aware of cancer as a diagnosis or condition, subsequent questions regarding cancer and cervical cancer were skipped. Before asking questions about attitudes toward and acceptability of HPV vaccination, all participants received a standard educational script on HPV and cervical cancer risk factors and prevention. Participants were also asked how much they would be willing to pay for HPV vaccination.

After obtaining written informed consent, research nurses administered the questionnaire. The questionnaire was created in English, translated into Nyanja, the vernacular Bantu language in Lusaka, and back-translated for accuracy. Both the questionnaire and informed consent documents were available in both English and Nyanja. Each participant received a small monetary reimbursement for her time and participation.

The study was approved by the institutional review boards at Beth Israel Deaconess Medical Center and the University of Zambia.

Results

A total of 319 women completed the survey. Nine of these women did not meet eligibility criteria for age and were excluded from the analysis. The mean age was 33.2±8.2 years and

86.7% were married. Most (86.7%) women had children, and the mean number of children was 2.9 ± 2.1 . The mean amount of education completed was 8.3 ± 3.6 years, and 3.9% received no education. Forty-nine percent reported they were unemployed. Demographic characteristics are shown in Table 1.

Almost all women reported knowledge of other vaccines and wanted their children to be vaccinated (Table 2). Of women who knew of vaccines, 98% wanted their children vaccinated. Of women who had their children vaccinated, 13.9% reported adverse vaccine reactions among their children.

Three hundred women (96.8%) had heard of cancer and of them, 224 women (74.7%) had heard of cervical cancer. Of women who knew of cervical cancer, 42.2% sited sexual activity or multiple partners as a cause, 73.3% believed it to be preventable, and 57.8% sited limiting sexual partners as a way to prevent cervical cancer (Figure 1). The majority of women (62.3%) aware of cervical cancer believe that there is a treatment for it. Seventy percent of women reported ever having a pelvic or speculum exam. Among women who had heard of cervical cancer, 33.3% believed that there was a relationship between cervical cancer and AIDS.

Following the standardized education component, 47.4% of women would pay something for the HPV vaccine. Almost all women (96.1%) would vaccinate themselves and 98.1% would allow their children to be vaccinated. Ninety-three percent of women believed that their families would allow their children to be vaccinated for a sexually transmitted infection (Table 3).

Discussion

Our data demonstrate widespread acceptance of HPV vaccination among adult women seen in medical clinics in Lusaka, Zambia, both for themselves and for their children. The potential impact of HPV vaccination on deaths from cervical cancer in Zambia is substantial given the high prevalence of disease.

Since its introduction in 2006, the HPV vaccine has been highly debated because it is the first vaccine aimed at the primary prevention of cancer, targeted at school-age children, and caused by a sexually transmitted infection. Numerous studies have explored the attitudes of men and women on HPV vaccination, both for themselves and their children (7-17). Interestingly, the majority of these studies were conducted in countries where cervical cancer rates have dwindled in the last few decades due to widespread screening measures. In countries where cervical cancer remains a leading cause of death for women, relatively few studies have been done. Furthermore, only a handful of studies have explored knowledge and attitudes in sub-Saharan Africa (18-22), where cervical cancer, in the setting of high HIV/AIDS prevalence, creates an even greater burden on women's health.

In our study, familiarity with vaccines and trust of vaccination was high, findings confirmed by recent data published by UNICEF reporting vaccination rates from 77-92% of childhood vaccines in Zambia (23). This undoubtedly contributes to the nearly universal acceptability of HPV vaccination in our study. Women sited health clinics most often as their source of

information regarding vaccination, making clinics a logical venue for cervical cancer education.

Our findings are similar to that of other studies in Africa (18, 20-22). In Ghana, 94% of 264 women surveyed were willing to vaccinate themselves or their daughters, and a study in Botswana showed that 88% of 376 women would allow their adolescent daughters to receive the HPV vaccine (21, 22). Similarly, a survey of 147 Kenyan women reported that 95% of them were willing to have their daughters vaccinated to prevent cervical cancer. Willingness decreased when women learned that 3 shots were required (18). Our study did not assess acceptability based on doses in vaccine regimen; however, this could be explored in a follow-up survey.

There are several limitations of this study. Participants were a self-selected group of care seekers as they were recruited at health clinics, thereby potentially limiting the generalizability of these findings to women who access health care. In addition, a nurse-administered questionnaire may lead to social desirability bias that may explain the positive response to vaccines among our study participants. While vaccination rates estimated by UNICEF are subject to measurement error, the high familiarity with vaccines can be explained by the high uptake of vaccines in Zambia. The cross-sectional nature of the study also limits the amount of causal inference that can be made and restricts associations to the time period studied.

The cost of the HPV vaccines has largely been prohibitive for low-resource countries. Mathematical models predict that the vaccine has the potential to prevent approximately 3 million deaths in the world's poorest countries if 70% of adolescent girls receive the vaccine over ten consecutive years (24). In addition to the cost, other characteristics of HPV vaccination (cold storage requirement, target age in adolescence) make its implementation difficult. Without external monetary assistance, developing countries are unlikely to sustain an HPV vaccine program; however, studies like this one that document high acceptance of the vaccine provide data to support initiating life-saving immunization against cervical cancer.

The Zambian Ministry of Health and Centre for Infectious Disease Research in Zambia have implemented a successful cervical cancer screening program (5). They have demonstrated efficacy and safety of a screening program adapted to a resource-poor setting (25). By training nurses to perform initial screening and treatment of abnormal cervical lesions, the program has screened over 57,000 women and over 6,000 women have been treated for pre-cancerous lesions since its inception. The program has trained over 70 healthcare professionals worldwide on their method and model of screening (26). Studies like this one help demonstrate that women are receptive to HPV vaccination. Our study also provides information that may be used to develop educational messages when HPV vaccination becomes available in Zambia.

In conclusion, this study provides one of the first questionnaire-based assessments of women in Zambia regarding their knowledge and attitudes on cervical cancer and HPV vaccination. Our findings confirm the acceptance of vaccination in Lusaka and suggest that awareness of

cervical cancer and both utilization and acceptability of vaccines are high among women in these two health clinics in Lusaka, Zambia. Zambia has one of the highest incidence and mortality rates due to cervical cancer in the world. The addition of HPV vaccination in the country will help create a comprehensive preventative strategy to help alleviate significant suffering and death from this malignancy.

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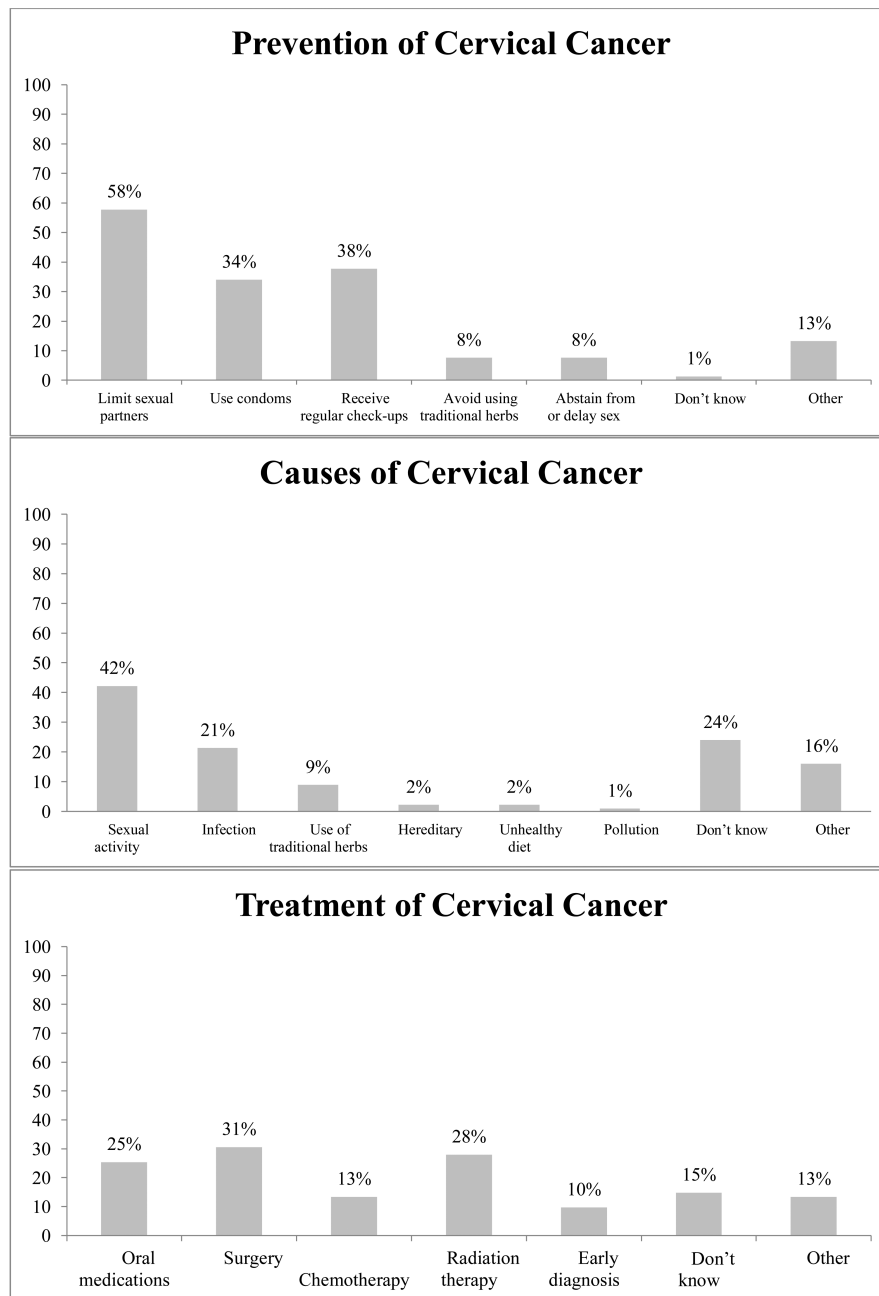
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^a Data is expressed as number (percentage) among respondents who knew of cervical cancer. Participants were not limited to one answer.

Figure 1. Cervical cancer prevention methods, causes, and treatment option sited by women in Lusaka, Zambia (n=227)^a

Table 1

Demographic characteristics of women surveyed in Lusaka, Zambia

<i>Characteristic</i>	n = 310
	Mean ± SD
Age in years	33.2 ± 8.2
Years of education	8.3 ± 3.6
Number of children	2.9 ± 2.1
Female children	1.5 ± 1.3
Male children	1.4 ± 1.3
	n (%)
Have children	269 (86.7)
Occupation	
Unemployed	144 (46.5)
Business woman	64 (20.6)
Manual laborer	35 (11.3)
Education	13 (4.2)
Healthcare	10 (3.3)
Public sector	7 (2.2)
Other	19 (6.1)
Marital status	
Married	264 (85.1)
Single	20 (6.5)
Widowed	18 (5.8)
Separated/divorced	8 (2.6)

Table 2

Knowledge and awareness of vaccines among women in Lusaka, Zambia

<i>Characteristic</i>	n = 310 (%)
Ever heard of vaccines	
Yes	306 (98.7)
No	4 (1.3)
Among women who had ever heard of vaccines (n = 306)	
Want children to receive vaccinations	300 (98.0)
Had children vaccinated	265 (86.6)
Among women who had their children vaccinated (n = 265)	
Child experienced reaction to vaccine	37 (13.9)

Table 3

Attitudes towards HPV vaccination among women in Lusaka, Zambia

<i>Attitude</i>	n=310 (%)
Would vaccinate self against HPV	
Yes	298 (96.1)
No	11 (3.6)
Don't know	1 (0.3)
Would allow children to be vaccinated against HPV	304 (98.1)
Family would approve of children being vaccinated against HPV	
Yes	291 (93.9)
No	12 (3.9)
Don't know	7 (2.3)
Amount willing to pay for HPV vaccine (Zambian kwacha)	
Nothing	163 (52.6)
5,000 – 10,000 (US\$ 1-2)	88 (28.4)
20,000 – 50,000 (US\$ 4-10)	31 (10.0)
50,000 – 100,000 (US\$ 10-20)	20 (6.5)
More than 100,000 (>US\$ 20)	8 (2.6)