IMPROVING HUMAN PAPILLOMAVIRUS IMMUNIZATION RATES IN KENTUCKY

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INTRODUCTION

According to the Centers for Disease Control and Prevention, "Human Papillomavirus (HPV) is the most common sexually transmitted infection in the United States" (1). Other means of transfer of the virus have been noted, including transmission from mother to fetus (2,3) and transmission through oral-genital routes (4). These varying means of infection and the prevalence of infection make HPV a significant concern in pediatric and adolescent medicine (4).

When infected, HPV may remain in quiescent stage and lead to asymptomatic expression or it may manifest with a self-limiting course with risk of differentiation to malignant state (5). Pathological presentation of cervical cancer, genital warts, ano-genital cancer, and oro-pharyngeal cancer are well described with HPV infection (6). The link between HPV and cervical cancer is well established and stronger than the link between smoking and lung cancer (6). Although there are ways to manage diseases related to HPV infection, there is no treatment for HPV infection itself. Thus, prevention via HPV vaccination is key to reducing HPV infections and associated diseases, especially cervical cancer, which is the third most common cancer in women in the United States (6). While cervical cancer only affects females, it is necessary to vaccinate males as well given that they can transmit HPV to females via sexual contact.

In Kentucky, there is a low inclination for uptake (47.6% of females and 19% of males in Kentucky versus 57.3% of females and 34.6% of males nationally) (7) and adherence (26.8% of females in Kentucky versus 37.6% of females and 13.9% of males nationally) to HPV vaccine, even when it is free (8,9). Further evidence of relatively limited HPV prevention in the state of Kentucky is in the state's cervical cancer rates. Kentucky exceeds the national average in cervical cancer rates (9.3 per 100,000 in Kentucky versus 7.4 per 100,000 nationally) and ranks 5th in the national in cervical cancer rates (8).

In the adolescent medicine clinic at the University of Kentucky, medical providers are working to address this national and local public health concern by encouraging all patients within the recommended age range (9-26) to start and finish the HPV vaccine series regardless of sex and sexual activity. The goal of this retrospective study is to determine if our vaccination rates exceed the local and national averages given our practices.

METHODS

We conducted a retrospective study in order to examine rates of vaccination in our clinic in an effort to evaluate our efforts in promoting HPV immunization. We included new adolescent patients between ages 9-26 seen in our facility from 10/2006-09/2015, with patients who had already begun the vaccine elsewhere excluded. Patients who had Medicaid and were 19 years of age or older were also excluded as Medicaid requires the vaccines to be administered at the Health Department. The total number of patients who met criteria was 1423, which included 1014 females and 409 males. In addition, we always inquire about sexual activity in all patients which is standard of care. In this study we also analyzed sexual activity data at first injection.

Our approach to vaccinations in our clinic is to review vaccine records for all patients during the first visit. We then council the patients and parents on importance of vaccines as disease prevention and public health issue, provide comprehensive verbal and written information on all vaccines and then all missing vaccines are offered. The message is: your child needs the following vaccines for reducing their chances of disease acquisition not just because of school requirement or lack thereof. We also use any patient visit, not just annual exams to address vaccine needs. Patients are given appointments for the next date to continue their vaccination and are reminded by phone 3 days prior to their appointment time. We do not single out HPV as an afterthought or in conjunction with sexual activity.

The population of our clinic is not different than that of any primary care clinic because we do provide primary care as well as specialized care but the demographics and health of our patients is similar to that attending family medicine, internal medicine or pediatric clinics.

RESULTS

The study included 1423 eligible patients (1014 females and 409 males), as described above. Of these patients, 1010 females (99.6%) and 401 males (98%) started the HPV series of three vaccines and 562 females (55.4%) and 149 males (38.9%) completed the series (Table 1). These rates exceed local and national rates as depicted below. The average age at first injection was 14. At first injection 63.5% of patients reported no sexual activity. Data are not available for how man males finish the vaccine series in Kentucky.

Table 1 Rates of uptake and adherence to the HPV vaccine series in the clinic, state, and nation

	Clinic % (n)		Kentucky		United States	
	Start	**Finish**	**Start**	**Finish**	**Start**	**Finish**
Female	99.6% (1010)	55.4% (562)	48%	27%	57%	38%
Male	98% (401)	38.9% (159)	19%	n/a	35%	14%

Source: State data obtained from "National, Regional, State, and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years — United States, 2013." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 25 July 2014.

DISCUSSION

As aforementioned, HPV associated cancer rates in Kentucky are amongst the highest compared to other states in the United States. Effective communication between medical providers, patients, and their parents are critical to improving vaccination uptake and adherence in Kentucky (9). In the adolescent medicine clinic at the University of Kentucky, our approach to HPV vaccination with patients and their parents has allowed us to begin vaccination with about 99% of eligible patients and complete vaccination with about 51% of eligible patients (as of data collection date, most are on track to complete their series)

Rates of vaccination in our clinic far exceed local and national rates, especially for males. Compared to local and national data, twice as many females and three times as many males began the vaccination series. Compared to Kentucky, twice as many females completed the vaccination series. Data are not available for males who completed HPV vaccination in Kentucky; however, twice as many males completed the vaccine series in our clinic versus in the Unites States.

Ideally, patients should receive the HPV vaccine prior to sexual activity given that HPV is transmitted primarily through sexual contact. For this reason, it is recommended that patients start vaccination by age 11 or 12 (9). The average age at first injection in our clinic was 14, leaving room for improvement. Moreover, about 46% of our patients report engaging in sexual activity prior to beginning vaccination.

Vaccination in patients who already are sexually active is still effective in preventing the virus types of the vaccine even if the patient has acquired one type, the vaccine can still prevent the other as indicated by the Food and Drug approval and the vaccine package insert. Our goal is to follow the steps outlined below in order to improve vaccination rates prior to sexual activity, further preventing the incidence of cervical and other cancers in our patient and local population.

CONCLUSION

With the higher rates of HPV vaccination observed in our clinic compared to that of the state and the United States, we feel that implementing the following methods to increase vaccination rates in local and national pediatric clinics works.

Step 1: Educate parents and patients on HPV and its potential effects and offer it as part of needed

vaccines not an afterthought.
Step 2: Encourage vaccination at each visit, highlighting the benefits and limited risks of acquiring the vaccine.
Step 3: Incorporation of patient-centered reminders, and commendation for beginning the series.
Step 4: Continue further reinforcement throughout the course and recapitulate the importance of completing the vaccination.

Although these will require consistency in health care provider efforts, the benefits we anticipate are invaluable to the population. We envision that our approach, if implemented within the state as a whole, will lead to increasing HPV vaccination and a corresponding decline in the prevalence of the HPV related pathology in Kentucky.

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