Iraqi Journal of Public Health
Nab'a Al-Hayat foundation for Medical Sciences and Health Care

ORIGINAL RESEARCH ARTICLE

Knowledge and awareness of human papilloma virus and vaccine among medical students in Erbil city

Hozan Yousif Hassan

Abstract

Objective: Human papilloma virus has strong correlation with cervical cancer, which is the second most common cancer worldwide among women. Since 2006 the World Health Organization reported effective vaccines, as preventing cancer with the help of a vaccine is a comparatively new concept, awareness and education about it will have important implication in the implementation of this strategy. The aim is to provide an understanding about awareness and knowledge of HPV and HPV vaccine among medical students in Erbil city.

Methods: This questionnaire survey was conducted at Hawler Medical University. About 20 convenient samples from each of the five colleges of the university were chosen. Data were analyzed using the statistical package for the social sciences (SPSS) version 23.

Results: The mean age of the participants was 22 years, 71% ($n = 66$) have heard of HPV, 64.5% ($n = 60$) knew that HPV cause genital warts and 51.6% ($n = 48$) noticed that it cause cervical cancer. Only 37.6% ($n = 35$) were aware that the HPV vaccine is available to prevent cervical cancer, in addition, the lowest score of awareness was 9.7% ($n = 9$) in which the vaccine can be given to women already having an infection. About 6.5% ($n = 6$) reported that they have been vaccinated.

Conclusion: There was a highly statistically significant association between level of awareness with age and the college of participants, while there was no statistically significant difference with gender. Generally, the students have moderate knowledge about the virus, but in contrast, they have limited information about the HPV vaccine.

Keywords: Awareness, HPV, HPV vaccine, Medical students, Erbil, Iraq

Introduction

"Human papillomaviruses (HPV) are small, non-enveloped, double-stranded DNA viruses of the papovavirus family. There are more than 100 types of HPV based on DNA homology," about 40 of them can be easily transmitted sexually. Certain types of HPV have a strong correlation with cancer; they are classified as high-risk HPV types which are types 16 and 18. The second most common cancer worldwide among women is cervical cancer; approximately 500,000 women are identified with cervical cancer, which causes nearly 270,000 deaths every year globally. Out of these numbers 230,000, about 85% of deaths is owned by developing countries. The low-risk HPV include for instance types 6 and 11, which are responsible for more than 90% of all genital warts.[1]

According to center for disease control, the virus is most commonly transmitted through sexual contact. Usually, infected individuals are asymptomatic and transmission can occur. Symptoms can develop years after infection. The causative virus can also lead to the development of anal, oropharyngeal, and rare cancers such as penile cancer. Studies stated that type 16 accounts for more than half of cervical cancer in the US and Europe.[2,3]

At the time, one of the high-risk HPV infects the epithelial cells; it initiates to produce both important proteins E6 and E7. These proteins are able to disturb the natural cell function to block excessive growth of cells. As a result, the virus enhances the cell to grow in an uncontrolled way and do not allow apoptosis of the infected cell, which can

*Correspondence: hozan_aspindara@yahoo.de
Department of Pharmacognosy, College of Pharmacy, Hawler Medical University, Erbil, Iraq

Submitted: 29 October 2017 | Revised version received: 18 November 2017 | Accepted: 27 December 2017
Published online: 22 March 2018

be followed by sequences of mutation in the cellular gene. One of the consequence is that it causes further atypical cell growth, it develops into precancerous cells and finally to cancerous tumor.

The various papillomavirus types can infect different types of epithelium cells, as the virus is extremely tropic for the cells of the skin and mucous membrane. It can result in progression of several kinds of warts, for instance, such as skin warts, plantar warts, anogenital warts, laryngeal papillomas, and various cancers inclusive of the cervix, vulva, anus, and penis. HPVs that cause the typical warts of the hands and plantar warts of the feet usually do not infect the genitalia. On the other hand, the HPVs that cause genital warts may infect the cervix, but they do not generally predispose to cancer.[4]

The World Health Organization explains that two highly effective vaccines are available for preventing viral infections caused by type 16 and type 18, which are together accountable for nearly 70% of cervical cancers worldwide. In many countries, the main target for vaccination is young adolescent girls between age 9 and 14 years. The time of receiving the vaccine depends on the age of the recipient. "Females less than 15 years at the time of first dose a 2-dose schedule (0 and 6 months) is recommended. If the interval between doses is shorter than 5 months, then a third dose should be given at least 6 months after the first dose. For females, equal or more than 15 years at the time of first dose a 3-dose schedule (0, 1–2, and 6 months) is recommended.[5] On the one hand, a research, which was conducted in India explained that the part taker were poorly aware about HPV infection and vaccination. Nearly, 77.2% of people did not know that there is a link between the virus and the cervical cancer.[6] On the other hand, another study in India stated that 89.2% had an idea that cervical cancer can be caused by a virus. Another study that has been done in United Kingdom showed that 70% of the participant did not heard of the papilloma virus.[7]Data is not yet available on the HPV burden in the general population of Iraq, but studies have been done to detect the frequency and genotyping of HPV in breast cancer patients,[8] while very few studies about knowledge of the HPV have been done. One of the results in a study in Diyala demonstrated that 53.5% were aware of the virus, while 36.2% understand that it may cause cancer.[3]

Molecular techniques confirmed the relation of HPV and cancer. The importance of this research is expanding the degree of knowledge and awareness about several aspects of HPV infections and vaccine. Iraq has a population of 10.74 million women ages 15 years and older who are at risk of developing cervical cancer, which ranks as the 12th most frequent cancer among women in Iraq. Therefore, studies assist and support in control and prevention of cervical cancer by providing data about their knowledge. The first reason why medical students have been included in the study is that the target population for vaccination are young adults. The second reason is that medical students will work in the healthcare system in hospitals and perform significant role in distribution of information among a widespread range of population, as they are the first line of information for patients.[1]

The fact that the national immunization program does not include the HPV vaccine, since the vaccine program for young females has been permitted since 2006. There have not been any HPV vaccine programs in Iraq. As preventing cancer with the help of a vaccine is a comparatively new concept, awareness and education about it will have important implication in the implementation of this strategy. Therefore, very few studies have been done about knowledge of vaccine and the causative agent in Iraq especially in Kurdistan. As a result, a research is essential and required in this field to fill the present information gap. The aim is to provide an understanding about awareness and knowledge of HPV and HPV vaccine among medical students. The objectives are to assess the degree of awareness and attitude in several aspects of HPV infection, such as symptoms, transmission, and vaccine and to find out if there is a significant association between the level of awareness and gender, age, and college.

Methodology

This questionnaire-based survey was conducted in May 2017 at Hawler Medical University, which consists of five colleges; medicine, dentistry, pharmacy, health sciences, and nursing. The sample population includes postgraduate and undergraduate students of Hawler Medical University between the age of 18 and 33 years, the students were asked to complete the questionnaire immediately; therefore, 100 questionnaires were distributed but only 93 were returned completely. A convenient samples of 20 students were chosen from each five colleges.

The questionnaire form includes, three socio-demographic information of the participants and the other 12 questions can be divided into 2 parts, the first six questions were about knowledge of HPV, and the other six questions were related to their knowledge about HPV vaccine. Data were analyzed using the statistical package for the social sciences (SPSS) version 23. Simple descriptive analysis and frequency calculation has been done for the variables. Chi-square and Fischer's exact test was used to assess the significance of the responses and a P-value < 0.05 was considered statistically significant.

Result

Questionnaire completion

A total of 100 questionnaires were distributed, but only 93 were completed and returned back. As a result, the response rate was 93%. Out of the seven discarded questionnaires, three were incomplete answered and four of them were not returned back.

Demographic characteristics of participants

A total number of 93 students participate in the study; the age of sample population was between 18 and 31 years while the mean age is 22 years. The sample population covers

all five colleges of Hawler Medical University as stratified sampling has been used, the response rate was the highest among students from the pharmacy college with 20.4% (n = 20) and the lowest from the college of nursing with 18.3% (n = 17) as described in Table 1.

Frequency of awareness

One part of the questions were related to awareness about the causative agent and the second part is about their knowledge about the vaccine. The highest knowledge was about the vaccine doses with an awareness frequency of 75.3% and the lowest was related to receiving vaccine in women already having an infection with 9.7%. The frequency of awareness of the participants toward several questions is summarized in Table 2. However, 6% of the participants reported that they have been vaccinated against HPV.

Table 1 Demographic characteristics of the participants

Demographic data	Frequency	(%)
Gender		
Female	61	(65.6)
Male	32	(34.4)
Age group		
18–24 years	74	(79.56)
25–33 years	19	(20.43)
College		
Medicine	19	(20.4)
Dentistry	19	(20.4)
Pharmacy	20	(21.5)
Nursing	18	(19.4)
Health Sciences	17	(18.3)
Total	**93**	**(100)**

Table 2 Frequency distribution table regarding awareness of HPV and HPV vaccine

Awareness regarding the questions	Frequency	(%)
Q1. Have you ever heard of HPV	66	(71)
Q2. How is HPV transmitted	50	(53.8) (54.8)
Q3. Who can become infected with HPV	51	(64.5) (51.6)
Q4. HPV can cause genital warts	60	(74.2) (37.6)
Q5. HPV can cause cervical cancer	48	(9.7) (59)
Q6. Symptoms of HPV	69	(75.3) (23.7)
Q7. Is a vaccine available to prevent cervical cancer	35	(6.5)
Q8. Can it be given to women already having an infection	9	
Q9. Which age group should the vaccine be given	55	
Q10. How many doses of vaccine	70	
Q11. Can the vaccine be given to boys	22	
Q12. Are you vaccinated for HPV	6	

Relation between gender and awareness

Generally, awareness in females was higher than in males, but this difference failed to reach statistical significance, the results are shown in Table 3.

Relation between awareness and college

According to the awareness of the different colleges, knowledge among the participants of health science college was the highest and among the nursing college, it was the lowest as shown in Table 4.

Relation between age and Level of awareness

Students between the age of 18 and 24 years had more information than the 25–33 years group in all questions, and this difference is highly statistically significant in most of the questions as shown in Table 5.

Discussion

The study showed that the level of knowledge about HPV was moderate, 71% of students have heard of HPV. A study conducted in the UK among women observed that 30% have heard from HPV,[9] this difference is related to the medical background of the students in the present study. While another study was done among healthcare workers and students in Iraq showed that only 53.5% have heard of the virus.[3]

A research in India, which was among senior medical students, 89.2% knew that HPV can be a cause of cervical cancer,[1] in contrast to medical students in this study, only 10.8% understand that HPV is carcinogenic this may be due to the reason that all the stages participate in the present study. The research also indicate that only 37.6% of the students knew that cervical cancer can be prevented through vaccine similar poor knowledge was found in a study in south Africa with 49% of participants.[10] This study showed that 64.5% knew that the virus causes genital warts while the study in Diyala stated that only 30% knew that it can cause genital warts. Regarding the transmission of HPV nearly 53.8% understand that it is transmitted sexually in contrast to another study among females in the UK, only 30% knew the mode of infection of the virus. Another statement that both women and men can be infected in the present study more than half of the participants were aware of it while in same study in the UK, only 19% have noticed that. Regarding the fact that HPV is sometimes symptomatic our students in Erbil, a good knowledge was realized with 74.2% while compared to the same study in the UK have very poor knowledge with 17%.

The awareness about the HPV vaccine was very poor among the students; this may be due to the fact that in Iraq no vaccine programs are available currently. The question if males can receive the vaccine, there was generally a poor knowledge 23.7% had information about it, similar poor awareness has been reported in a study in India in which only 25.2% knew it.[10] However, 6.5% of the

Table 3 Comparison of awareness of HPV and HPV vaccine according to gender

Questions	Male awareness		Female awareness		*P*-value
	Frequency	(%)	Frequency	(%)	
Q1. Have you ever heard of HPV	23	(24.7)	43	(46.2)	0.889
Q2. How is HPV transmitted	13	(14)	37	(39.8)	0.133
Q3. Who can become infected with HPV	21	(22.6)	30	(32.3)	0.163
Q4. HPV can cause genital warts	18	(19.4)	42	(45.2)	0.491
Q5. HPV can cause cervical cancer	13	(14)	35	(37.6)	0.113
Q6. Symptoms of HPV	23	(24.7)	46	(49.5)	0.936
Q7. Is a vaccine available to prevent cervical cancer	9	(9.7)	26	(28)	0.327
Q8. Can it be given to women already having an infection	2	(2.2)	7	(28)	0.327
Q9. Which age group should the vaccine be given	21	(22.6)	34	(49.5)	0.135
Q10. How many doses of vaccine	24	(25.8)	46	(49.5)	0.511
Q11. Can the vaccine be given to boys	8	(8.6)	14	(15.1)	0.657
Q12. Are you vaccinated for HPV	4	(4.3)	2	(2.2)	0.176

Table 4 Level of awareness of HPV and HPV vaccine according to college

Questions	Medicine %	Dentistry %	Pharmacy %	Health sciences %	Nursing %	*P*-value %
Q1. Have you ever heard of HPV	16.6	17.2	12.9	15	9.7	0.167
Q2. How is HPV transmitted	9.7	14	5.4	15	8.6	0.016
Q3. Who can become infected with HPV	16.9	16.3	8.7	13	6.5	0.003
Q4. HPV can cause genital warts	15.1	12.9	8.6	16.1	11.8	0.039
Q5. HPV can cause cervical cancer	10.8	9.7	6.5	15.1	9.7	0.143
Q6. Symptoms of HPV	15.1	12.9	18.3	17.2	10.8	0.02
Q7. Is a vaccine available to prevent cervical cancer	8.6	6.5	3.2	14	5.4	0.001
Q8. Can it be given to women already having an infection	1.1	5.4	1.1	1.1	1.1	0.046
Q9. Which age group should the vaccine be given	12.9	12.9	10.8	14	8.6	0.034
Q10. How many doses of vaccine	12.9	19.4	14	16.1	12.9	0.247
Q11. Can the vaccine be given to boys	7.5	5.4	0	6.5	4.3	0.003
Q12. Are you vaccinated for HPV	1.1	2.2	1.1	1.1	1.1	0.972

Table 5 Level of awareness of HPV and HPV vaccine according to age

Questions	18–24 years frequency	(%)	25–33 years frequency	(%)	*P*-value
Q1. Have you ever heard of HPV	49	(52.70)	17	(27.10)	0.02
Q2. How is HPV transmitted	40	(43.10)	10	(10.90)	0.008
Q3. Who can become infected with HPV	39	(42)	12	(13)	0.002
Q4. HPV can cause genital warts	52	(56)	8	(8.70)	0.001
Q5. HPV can cause cervical cancer	38	(41)	10	(10.90)	0.001
Q6. Symptoms of HPV	54	(58.30)	15	(16.20)	0.055
Q7. Is a vaccine available to prevent cervical cancer	34	(36.60)	1	(1.10)	0.001
Q8. Can it be given to women already having an infection	4	(4.40)	5	(5.50)	0.001
Q9. How many doses of vaccine	55	(59.30)	15	(16.50)	0.867
Q10. Can the vaccine be given to boys	19	(20.60)	3	(3.30)	0.005
Q11. Are you vaccinated for HPV	5	(5.50)	1	(1.10)	0.701

students reported that they have been vaccinated, although there are no vaccine programs for HPV in Iraq, maybe they have receive the vaccine in another country or they misunderstood it with the HBV vaccine. Similar results have been found in a study in India in which only 7% were vaccinated even though the vaccine programs are available in India.[11] According to the vaccine dose, a high knowledge was noticed with 75.3% in contrast in another study only 40% were aware of that.[1] Sufficient knowledge was also observed about the age group who can receive the vaccine with 59%, while the lowest score of awareness was observed in the question if women with HPV infection can receive the vaccine only 9.7% knew it. Highly statistical differences were observed between age and level of awareness; the age group between 18 and 20 years were more aware than the other age group in all questions. This may be due to the fact that the vaccine is introduced 2008 and therefore, they missed to study these information ($P = 0.001$) was observed in the questions that the virus cause genital warts , cervical cancer, that cervical cancer can be prevented through the HPV vaccine, that the vaccine can be given when an infection is present.

Statistically significant differences were noticed between the college and level of awareness. Students of health sciences college were generally high awareness regarding the transmission route of the virus ($P = 0.016$) that it cause genital warts ($P = 0.09$), that cervical cancer can be prevented, which was highly significant ($P = 0.001$) and the age group for vaccination ($P = 0.034$). This is due to the fact that the students study virology as a separate lecture. College of medicine and dentistry have moderate awareness while the students of nursing had poor knowledge.

On the one hand, females in this study were more aware than males, but it was not statistically significant as similar conclusion isfound in a study in Iran [12], this may be due to fact that more females (65.6%) were included in the present study. On the other hand, opposite results were observed in a study, girls had significantly more knowledge than boys.[11]

The present study is the first initiative to evaluate the degree of awareness and knowledge of HPV and HPV vaccine among medical students in Hawler Medical University. In addition, the responsiveness of the questionnaire form was high with 93%, and primary data has been used in the present research. Another strength of the paper is that students from all five colleges of Hawler Medical University participated, which provides a representative result. Although the study had some limitations, one of them is that choosing the 20 students from each college was based on convenience of sampling as the questionnaire distribution was just a couple of days before the start of holiday. Another point was that only twelve questions were included in the questionnaire form, in case of more questions a more satisfactory result could have been achieved. In addition, the small sample size is another limitation in the current study.

Creation of awareness on transmission routes of HPV and that cervical cancer can be prevented through vaccine to young adults through workshops, conferences, and continuing education programs. A study is required which includes a larger sample size to provide a more representative result and to spread more information about the virus.

Conclusion

Generally, the students have sufficient knowledge about the virus, but in contrast, they have poor information about the HPV vaccine. About 71% heard of HPV while 37.6% understood that cervical cancer can be prevented through the HPV vaccine, the lowest score of awareness with 9.7% was the information that the vaccine can be given to women already having the infection. There was a statistically significant difference among age and college with the degree of awareness.

Acknowledgment

I would like to thank all the students who participated in the study.

Conflict of Interest

None.

References

1. Pandey D, Vanya V, Bhagat S, Binu VS, Shetty J. Awareness and attitude towards human papillomavirus (HPV) vaccine among medical students in a premier medical school in India. PLoS One. 2012;7:e40619.
2. Nester EW, Roberts CE, Odell W, Pearsall NN, Anderson DG. Microbiology: A Human Perspective. WCB/McGraw-Hill; 1997. p. 200.
3. Hwaid AH. Knowledge and awareness of papillomavirus and cervical cancer among college students and health care workers women in diyala, Iraq. Am J Public Health Res Am J Public Health Res. 2013;1:221–225.
4. Brooks G, Carroll KC, Butel J, Morse S, Mietzner T. Jawetz, Melnick, & Adelberg's Medical Microbiology, Twenty-Fifth Edition. McGraw-Hill Companies, Incorporated; 2010. p. 832.
5. WHO | Human papillomavirus (HPV) [Internet]. WHO. [cited 2017 May 28]. Available from: http://www.who.int/immunization/diseases/hpv/en/
6. Ramavath KK, Olyai R. Knowledge and awareness of HPV infection and vaccination among urban adolescents in India: a cross-sectional study. J Obstet Gynecol India. 2013;63:399–404.
7. Pitts M, Clarke T. Human papillomavirus infections and risks of cervical cancer: what do women know? Health Educ Res. 2002;17:706–714.
8. Ali SHM, Al-Alwan NAS, Al-Alwany SHM. Detection and genotyping of human papillomavirus in breast cancer tissues from Iraqi patients/ Detection et genotypage du papillomavirus humain dans les tissus mammaires cancereux de patientes en Iraq. East Mediterr Health J. 2014;20:372.
9. Waller J, McCaffery K, Forrest S, Szarewski A, Cadman L, Wardle J. Awareness of human papillomavirus among women attending a well woman clinic. Sex Transm Infect. 2003;79:320–322.
10. Kalua EK. Knowledge about human papilloma virus, human papilloma virus vaccine and cervical cancer among female students at the University of Witwatersrand and their sexual practices [Internet]. 2013
11. Rashid S, Labani S, Das BC. Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India. PloS One. 2016;11:e0166713.
12. Fakor F, Mahfouzi L, Heirati D, Fatemeh S, Graili S, et al. Knowledge and attitudes of medical students about human papilloma virus (HPV) vaccination and associated factors. Holist Nurs Midwifery J. 2016;26:71–79.