

Original Research Article

HPV vaccine knowledge and coverage among female students in a medical college, Kerala

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Received: 06 October 2018

Revised: 20 November 2018

Accepted: 21 November 2018

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ABSTRACT

Background: Cervical cancer is the second most common cancer among women in developing countries including India. Human papilloma virus (HPV) infection of the cervix is the most common risk factor for cervical cancer. HPV infection is widespread and occurs soon after becoming sexually active. Lack of hygiene and multiple sexual partners increases the risk of chronic HPV infection. HPV vaccine offers protection against cervical cancer. However the knowledge about HPV and vaccine is very limited among the general public. Knowledge among doctors is essential to provide timely advice to the target population. This study aims to measure the awareness among female medical students in a medical college in Kerala.

Methods: 1st to 4th year female medical students of Amrita School of Medicine were administered an anonymous, validated self-administered pretested questionnaire. Only students who had volunteered and given consent were included in the study. 165 students participated in the study.

Results: The overall knowledge about cervical cancer its causation and prevention was good only in about 40%. However 83% had a positive attitude towards HPV vaccine and were willing to take the vaccine. Only 6% had been vaccinated against HPV.

Conclusions: There is a need to emphasize the aetiology and preventive measures of cervical cancer in the curriculum of MBBS students. In-depth knowledge among future doctors is essential for dissemination of knowledge to general public and timely preventive intervention.

Keywords: HPV vaccine, Cervical cancer, Medical students

INTRODUCTION

Cancer cervix is the second most common malignancy among women worldwide. In developing countries it is also the most common cause of cancer deaths in women. Cervical cancer occurs relatively early during the lifespan of woman. The incidence starts rising from 30–34 years of age and peak occurs in the decade between 55–65 years. The median age of cancer cervix in women is 38 years. Cancer cervix is the most common cancer among women in India. Approximately 132,000 new cases are

diagnosed and 74,000 die due to cancer cervix every year in India.¹

Invasive cervical cancer appears after 15–20 years of chronic infection by oncogenic serotypes of HPV. Out of the 100 serotypes of HPV discovered, 15–20 are oncogenic. HPV 16 contributes to about 50-60% and HPV 18 contributes to about 10% of all cancer cervix. HPV serotypes-6 and 11 contribute over 90% of genital warts, which are benign. The oncogenic HPV serotypes are also associated with anal, vulvar, vaginal, penile and oropharyngeal cancers. HPV transmission is associated with sexual activity and almost 75% of all sexually active

adults are likely to be infected with at least one HPV type. A vast majority of these infections resolve spontaneously and less than 1% progress to cancer.¹

In developing countries cancer cervix constitutes 88% of all cancer cases in women. Cancer cervix remains a major public health problem among women in India as it is the second most common cancer among women. About 1.25 lakh women develop the disease every year and about half of them die each year. The occurrence of cervical cancer in India peaks between 55 and 59 years of age. Aizawl, Mizoram has the highest age-adjusted rate of 24.3 per 100,000 women in India.² The incidence of cancer cervix has decreased considerably in the industrialised countries, by improvement in socio-economic status, personal hygiene and also screening programmes. Cancer cervix is unique in the sense it has a long precancerous stage of epithelial dysplasia during which period the disease can be detected by screening programmes and treated completely. However once the invasive stage is reached the treatment outcome is not very good.

Cervical screening programmes have contributed a lot to the decline of cancer cervix in developed countries. However lack of awareness, unavailability of services and cost factors has prevented widespread access and use of cancer cervix screening programmes in developing countries and also in India.²

The recognition that cervical cancer is a result of chronic infection by some mucosotropic types of HPV was a major breakthrough in cancer aetiology. By the turn of the millennium, significant and consistent epidemiological studies provided strong evidence for the association between HPV infections and cervical cancer. These included cross-sectional studies, case-control studies, follow-up studies, all of which provided evidence that chronic HPV infection of uterine cervix preceded several years of onset of cancer cervix. More than 90% of cases of cancer cervix specimens showed evidence of HPV DNA as compared to 20% of controls. The epidemiological conclusion from the evidence is that HPV infection is a necessary cause for cancer cervix. All other risk factors like cigarette smoking, multiple sexual partners, poor hygiene are considered as surrogate factors for HPV infection and or cofactors in those with HPV infection. Advances in viral detection methods have enabled us to correctly identify the subtypes strongly associated with cancer cervix from the numerous types of HPV.³

Almost 90% of all HPV infection gets cured spontaneously within a period of 2 years. However a small percentage persists and progress to cancer cervix. Even though genital warts have been commonly attributed to HPV, recent evidence show that cervical cancer is probably the more related to HPV. Almost all cases of cervical cancer can be to certain extent attributed to HPV infection.³ A persistent infection lasting 15-20

years with HPV is the minimum duration for malignant changes to occur in the uterine cervix. Multiple partners, tobacco use and immune suppression lead to higher risk of causing cancer cervix.

Human papilloma virus (HPV) was earlier thought to be an agent causing genital warts. However recent evidence shows that HPV infection is the one of the main risk factor for cancer cervix. HPV types 16 and 18 causes almost 70% of precancerous cervical lesions and cervical cancers.⁴ There are more than 100 serotypes of HPV and about 13 of them can cause cervical cancer. Cervical cancer is mainly caused by HPV types that are sexually acquired. Hence there is great scope for preventing cancer cervix by preventing infection with HPV, by improving personal hygiene and limiting sexual relations to one partner. Most sexually active women and men may be infected at some time in their lives and high risk behaviour may lead to repeated infection by HPV. The highest chance of acquiring infection is soon after becoming sexually active.

Three types of HPV vaccines are available globally—bivalent, quadrivalent and 9 valent. The first two are available in India. The dosage for children below 15 years is two intramuscular doses at an interval of six months. For those above 15 yr and for immune-compromised, the dosage recommended is three doses over a 6-month period. HPV vaccines claim about 99% seroconversion rates.⁵

With more than 270 million doses administered globally, HPV vaccine appears to have excellent safety record. There have been no serious adverse events reported from any part of the world. The adverse reactions reported are common to all injectable vaccines like vaccination site pain, tenderness, swelling, fever, headache, myalgia and gastrointestinal symptoms.⁵ Global experts have come to the conclusion that efficacy of HPV vaccine can be measured by using surrogate end point of preventing CIN2/3 dysplasias in population-based studies.⁶

In an Indian study 34,856 dose of the quadrivalent vaccine were administered to 10-18 year old children and were followed up for 4 years. No serious adverse events were reported at all. The study also showed in the short term single dose of HPV vaccine produced equivalent immunity to 2 or 3 doses schedule.⁷

Awareness about HPV vaccine is very low in India. A study by Joshi et al in Mumbai, among medical students, showed that the majority of the participants were lacking knowledge about HPV vaccine in all aspects. 96% of the participants were aware of the causative agent of cervical cancer. 69% of participants were aware regarding the availability of vaccine against cervical cancer.⁸

A study by Kavita of HPV infection and vaccination among adolescent girls of school and college of five metros of India showed that they had very poor

knowledge. 72% were not aware that virus causes cancer cervix.⁹

Unless the medical fraternity is aware about the cause of cancer cervix and its modes of prevention they will not advice the general public about the vaccine to prevent cancer cervix, which is a major public health problem. And the knowledge about the disease and its prevention should be imparted during the training period of doctors. The objective of this study is to find the level of awareness among female medical students in Amrita School of Medicine about cancer cervix its causes and prevention by HPV vaccine.

METHODS

Study design: Cross sectional study

Type of study: Survey

Study setting: Amrita School of Medicine, Kochi

Study population: Female medical students

Sample size: A study done in Chennai among medical and para-medical students of a tertiary care teaching hospital, showed 44.9% of the study participants had good knowledge regarding HPV vaccination. Based on this, the minimum sample size was calculated to be 130 using the formula $4pq/d^2$, where $p=44.9\%$, $q=100-p$ and $d=20\%$ of p .

Duration of study: July 2017 – August 2017

No. of subjects: 165 female medical students between the age group 17-23 from the 1st, 2nd, 3rd and 4th years of MBBS.

Inclusion criteria: Female medical students from 1st, 2nd, 3rd and 4th years of MBBS.

Exclusion criteria: Students those who did not give consent.

Data collection instrument: Self-administered pre-tested, validated semi-structured questionnaire.

Data collection method: A Self-Administered questionnaire was distributed to the students. The participants were assured of anonymity and confidentiality and were requested to complete the questionnaire regarding HPV infection, vaccination and cervical cancer after obtaining the consent.

The filled up questionnaires were collected back at the end of the allotted time. The students had the choice to participate or not in the survey.

Data analysis: Using SPSS.

Confidentiality: Anonymous questionnaire. No identification data was collected from the responders.

Ethical consideration: Ethical clearance was obtained from the Institutional Ethics Committee. A written consent has been obtained as per the recommendations of the committee.

RESULTS

Knowledge

The knowledge about various aspects of cancer cervix, HPV and HPV vaccination were given scores and combined to calculate the overall knowledge about the Cancer cervix and its prevention among the respondents. The survey showed that the overall knowledge was not very high among the respondents. Only about 40% showed good knowledge (Table 1). 75% were aware of the availability of vaccine and 68% have a good awareness regarding the target population of vaccination.

Table 1: Overall knowledge about cancer cervix and HPV vaccination.

| | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| Good | 67 | 40.6 |
| Poor | 98 | 59.4 |
| Total | 165 | 100 |

Table 2: Knowledge about the mode of transmission of HPV.

| | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Airborne | 1 | 0.6 |
| Waterborne | 3 | 1.8 |
| Sexual mode | 151 | 91.5 |
| Blood borne | 7 | 4.2 |
| Others | 3 | 1.8 |
| Total | 165 | 100 |

Table 3: Knowledge about the oncogenic strains of HPV.

| HPV strain | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| No response | 32 | 19.4 |
| 11,16 | 8 | 4.8 |
| 11,18 | 2 | 1.2 |
| 16,18 | 109 | 65.5 |
| 6,11 | 12 | 7.3 |
| 6,18 | 2 | 1.2 |
| Total | 165 | 100 |

Most of the students knew that HPV infection can be transmitted sexually (Table 2). More than hundred (65%) students have answered that the most important oncogenic strains of HPV are 16 and 18. However 20%

of respondents did not respond to the question at all (Table 3).

One critical aspect of cancer cervix prevention is the need to continue screening even after taking HPV vaccine. The vast majority of respondents had correct knowledge about the need to undergo some mode of screening after vaccination (Table 4).

Table 4: Knowledge about need for screening after HPV vaccination.

| | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| Yes | 150 | 90.9 |
| No | 15 | 9.1 |
| Total | 165 | 100 |

Only 17% of respondents gave the correct response for the combination of other risk factors for cervical cancer (cigarette smoking, multiple sexual partners, early onset of sexual activity). Majority answered that multiple sexual partners and early onset of sexual activity are the risk factors. 3 of them said that cigarette smoking alone is the risk factor. Nobody knew that poor hygiene leading to HPV infection was a risk factor for cancer cervix.

Most of the students (90%) were aware about Pap smear as the screening test for HPV. 12 students suggested Pap smear and colposcopy and 2 suggested pap smear and HPV test.

Regarding knowledge about the number of doses of vaccine, most (81%) knew that there is a need for more than 1 dose. 43% answered that 3 doses are required for full protection with HPV vaccine. The questionnaire did not specifically ask for the correct number, since the actual number of doses depends on the type of vaccine and age of administration.

31% of respondents knew that HPV vaccine can also prevent penile cancer and anal cancer, which are also associated with HPV infection. However a very high proportion (47.9%) responded that HPV causes cervical cancer only.

Attitude

Most of the respondents showed a highly positive attitude towards immunization, with a vast majority willing to take HPV vaccine (Table 5). The choice of place of vaccination was the hospital of the medical college in which the study was done (Table 6).

Table 5: Willingness to take HPV vaccine.

| | Frequency | Percentage (%) |
|--------------|-----------|----------------|
| Yes | 137 | 83 |
| No | 28 | 17 |
| Total | 165 | 100 |

Table 6: Choice of place for HPV vaccination.

| | Frequency | Percentage (%) |
|-------------------------------|-----------|----------------|
| Amrita hospital | 150 | 90.9 |
| Public hospital | 8 | 4.8 |
| General practitioner | 4 | 2.4 |
| Other private hospital | 3 | 1.8 |
| Total | 165 | 100 |

Vaccination coverage

The proportion of respondents who had taken the vaccine was only 6% (Table 7). The main reasons cited for not taking vaccination are lack of awareness, high cost of vaccine and fear of side effects.

Table 7: Immunisation coverage against HPV among respondents.

| | Frequency | Percentage (%) |
|---------------------|-----------|----------------|
| Vaccinated | 10 | 6.1 |
| Unvaccinated | 155 | 93.9 |
| Total | 165 | 100 |

DISCUSSION

In this study questions on knowledge were given scores to calculate the overall knowledge on cervical cancer and its prevention. The overall knowledge was below 50% mark and shows the need for improvement. In the studies done on medical students in Manipal and Delhi the overall knowledge score was not calculated. Calculating an overall score summarises the total knowledge on the topic and we feel that this is important.^{10,11}

The knowledge about the availability of vaccine (75%) among the study group and target population of vaccination (68%) was similar to the finding (75.6%) and (68.9%) respectively in the study done by Pandey et al at Manipal.¹⁰

91.5% of participants in our study were aware that HPV is transmitted sexually. This knowledge is very important from the point of view of prevention as having multiple sexual partners increases the risk of infection with HPV. In the study done by Mehta and others among medical students in Delhi only 38% knew about the sexual route of transmission.¹¹

In our study 65% knew about the common oncogenic strains of HPV. In the study by Chawla et al among healthcare providers 70% knew about the oncogenic strains.¹² The studies done on medical students did not have a question on the oncogenic strains.

In our study 91% respondents knew that screening for cancer cervix has to be continued even after vaccination.

The other studies did not have the question regarding continuation of screening after vaccination. It is important to emphasise the need for screening even after vaccination in all health education programmes lest this important aspect for prevention is overlooked.¹³ Our study showed that 90% of participants were aware that Pap smear was a screening test for cancer cervix.

Our study showed a small (17%) percentage of participants knew about other risk factors for causation of cancer cervix. Like most diseases cancers also have multi-factorial causation and a single factor is unlikely to cause disease. Other studies have largely restricted to knowledge about HPV as the main etiological factor for cancer cervix.²

81% of participants in our study knew that more than one dose is required for complete vaccination. In the study by Pandey et al, 40% of participants had correct knowledge about vaccination schedule.¹⁰

In our study only 31% knew that HPV vaccine can prevent penile and anal cancers as well. In the study by Swarnapriya et al among medical students only 8.8% knew that HPV vaccine can prevent penile cancer. The awareness that HPV vaccine can prevent penile cancer needs emphasis in health education in order to increase the acceptance of HPV vaccine among males.¹⁴

Regarding attitude towards vaccination 83% of participants in our study were willing to take HPV vaccine to prevent cancer cervix. 88% of respondents of the study by Sumita et al were willing to take the vaccine.¹¹ However a minority in that study (9%) felt that it can lead to promiscuity and 50% felt it can lead to a false sense of security.

Study by Rashid et al among college students showed a high knowledge about cancer cervix among girls compared to boys. Unlike medical students their knowledge about HPV and vaccines were only 44%.¹⁵

A study by Kavita et al among adolescents of 5 metro cities in India showed that 72 % of them did not know about cervical cancer or HPV. 77.2 % were not aware of the virus that causes cancer cervix. However after the health talks there was an overall significant positive improvement in both knowledge and awareness.¹⁶

6% of our study participants had taken HPV vaccine, which appears to be high in the Indian context. All other studies about HPV vaccines only reported willingness to take the vaccine and not actual coverage. No data is available on the coverage of HPV vaccine among any population in India. The high cost is one of the main reason for not taking the vaccine and hence only a very small proportion of the population in India has access to HPV vaccine.^{17,18}

This study showed that knowledge about cancer cervix and HPV vaccination is good among medical students. However there are certain important aspects of the disease and prevention that even they are unaware of. There is a need to include those aspects in the curriculum of medical students so that they can be effective in spreading the information and motivate eligible persons to take HPV vaccine.

ACKNOWLEDGEMENTS

Authors wish to thank all the female MBBS students of Amrita School of Medicine who participated in the study.

Funding: This study was supported by ICMR under the Short Term Studentship research Ref. ID. 2017-06148

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Niveditha Das E, Francis PT. HPV vaccine knowledge and coverage among female students in a medical college, Kerala. *Int J Community Med Public Health* 2018;5:5133-8.