

Awareness and attitude about carcinoma cervix and human papillomavirus vaccine: A cross-sectional study among undergraduate female medical students

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ABSTRACT

Background: Cancer cervix is the leading type of cancer in India. One woman die of cervical cancer in every 8 min in India. The primary cause of developing cervical cancer is chronic infection with high-risk human papillomaviruses (HPVs). Vaccination against HPV is the primary mode of prevention from cancer cervix. **Objective:** The objective of the study was to assess the awareness and attitude of young medical students about cancer cervix, its cause and HPV vaccine. **Materials and Methods:** An observational cross-sectional study was done among 2nd year to final year female medical students of M.K.C.G Medical College and Hospital for a period of 2 months. Data were collected using a self-administered, semi-structured, and pre-tested questionnaire. The study explored knowledge on HPV infection and cervical cancer, as well as awareness regarding the vaccine and their willingness to take the vaccine. **Results:** In the present study student's awareness about etiology of cancer cervix was 100%. About 98.6% of students knew about the high-risk strains of HPVs causing cancer. The awareness about preventable nature of cancer cervix among study participants was 93.8% and 92.5% students knew that the vaccine is available in India. About 87% of students wanted to be immunized with HPV vaccine. **Conclusion:** There is not enough knowledge about cancer cervix and HPV vaccine among medical students. Information regarding cancer cervix and HPV vaccine should be included early in the medical education curriculum. Group discussions and forums should be conducted to fill the knowledge gap.


KEY WORDS: Cervical Cancer; Human Papilloma Virus; Knowledge

INTRODUCTION

Worldwide, cervical cancer is the fourth most frequent cancer in women with an estimated 530,000 new cases in 2012.^[1] A large majority (around 85%) of the global burden occurs in the less developed regions, where it accounts for almost 12% of all female cancers.^[2] In 2012, approximately 270,000 women died from cervical cancer, it represents 7.5% of all female cancer

deaths.^[1] According to data of 2017, in India every year 122844 women are diagnosed with cervical cancer and 67477 die from the disease. Cervical cancer ranks the 2nd most frequent cancer among women in India and the 2nd most frequent cancer among women between 15 and 44 years of age. About 5.0% of women in the general population are estimated to harbor cervical human papillomavirus (HPV) - 16/18 infection at a given time.^[3]

The principal causative agent for the development of cervical cancer is the infection of specific high-risk types of HPVs. Although more than 140 types of HPVs have been identified only about 40 types are sexually transmitted. Of these, two high-risk HPV types 16 and HPV 18 are responsible for more than 80% of cervical cancer in India, and the low-risk types are HPV-6 and HPV-11, which cause genital warts, the

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virus commonly spreads through sexual intercourse.^[4] There has been definitive evidence to show that 70-80% cases of cervical cancers are due to persistent infection by the sexually transmitted HPV types 16 and 18.^[5,6]

Cervical cancer remains largely uncontrolled in high-risk developing countries due to ineffective or no screening.^[7] Since cervical screening only detects precancerous and cancerous changes after they have occurred, HPV vaccination is the primary mode of prevention.^[8] The infection is asymptomatic most of the times, so the individual may not be aware that she is infected. Thus, vaccination is an important way of protecting against HPV. Vaccination against HPV is also an important mode of primary prevention against cervical cancer as it is one of those risk factors that can be prevented.^[9]

Two vaccines licensed globally are available in India; a quadrivalent vaccine and a bivalent vaccine.^[10] The quadrivalent vaccine has been developed that protects against the two high-risk HPV types (types 16 and 18), which cause 70% of cervical cancers in women and 90% of all HPV-related cancers in men. It also protects against two low-risk HPV types (types 6 and 11), which cause 90% of genital warts. The bivalent vaccine protects against the same two high-risk HPV types (types 16 and 18).^[11] The HPV vaccine is licensed for use among women and girls in the age group of 9–26 years. Vaccine schedule requires three doses to be administered over a period of 6 months (quadrivalent: 0, 2, and 6 months and bivalent: 0, 1, and 6 months). The dose of the quadrivalent vaccine is 0.5 ml to be administered intramuscularly in the deltoid muscle. The vaccine should be shaken well before use, stored at 2°C–8°C and should not be frozen.^[12]

Knowledge and awareness about HPV and its vaccine is very important for the prevention of health hazards caused by HPVs. Today's medical students are the future physicians and they will serve the community, it is crucial that they should be aware of cancer cervix and its prevention through vaccine, as they play an important role in spreading awareness among general population. Therefore, the present study was conducted to know the knowledge and awareness of medical students regarding the etiology of cervical cancer, availability of vaccine, target population, dosage, route, site of vaccination and their attitude toward vaccination.

MATERIALS AND METHODS

The present study was conducted in M.K.C.G Medical College, Odisha, for a period of 2 months (January 2017 to February 2017). After the approval from the Institution Ethical Committee, the study was undertaken among undergraduate female medical students regarding the level of awareness on various aspects of HPV infection, cervical cancer, HPV vaccine, and their attitude toward receiving the vaccine.

All the female undergraduate medical students from 2nd year to final year who were present on the day of data collection

and who gave consent for the study were administered the questionnaire. Total 146 students participated in the study.

A self-administered, semi-structured, and pre-tested questionnaire designed for the study was given to the students. Students were educated on the purpose of the study and contents and completion of questionnaire. They were told that the data would be kept confidential and for research purpose only. Verbal consent was taken from the participants. The returned questionnaires were checked for completeness and consistency.

The study mainly focused on two parts, the first part explored knowledge on HPV infection and cervical cancer, while the second part explored as to how well these students knew about the vaccine and their willingness to take the vaccine.

RESULTS

The mean age \pm standard deviation (SD) of the students who participated in the study was 22.73 ± 2.13 years. Out of total 146 students, 97.3% were Hindus, and rest were Christians. All the students were boarders, and none of them were married. Parents of 18.5% of study participants were health professionals, and there was no family history of carcinoma cervix in any of the study participants [Table 1].

Knowledge Regarding HPV Infection

It was observed that all the students were aware that a virus, i.e., HPV was the cause of cervical cancer. About 98.6% of students had knowledge regarding the high-risk strains of HPV, i.e., 16 and 18 as the cause of cervical cancer. Regarding modes of transmission of HPV, 91.8% of students opined that it was by sexual route and 4.8% of students said it was by injections. About 94.5% participants were aware that HPV affected both male and female [Table 2].

Knowledge Regarding HPV Vaccine

Out of 146 study participants, 93.8% were aware that cervical cancer could be prevented by a vaccine and 92.5% had

Table 1: Background information of study population ($n=146$)

Variables	Results	Frequency (%)
Age	Mean age (SD): 22.73 \pm 2.13 years	
Religion	Hindu	142 (97.3)
	Christian	4 (2.7)
Residence	Hostel	146 (100)
Marital status	Unmarried	146 (100)
Occupation of parent	Health professional	27 (18.5)
	Non-health professional	119 (81.5)
Family history of carcinoma cervix	No	146 (100)

SD: Standard deviation

knowledge that the vaccine was available in India. About 76% students replied that HPV vaccine was not a part of national program, 75.35% students told that women did not have to be tested before HPV vaccination and 82.9% students knew that HPV could be given to sexually active women. About 71.9% participants had correct knowledge that HPV did not protect those already infected and 79.5% students were aware that HPV protects against other disease forms. Regarding vaccination of males against HPV, only 50% students knew that HPV is licensed for males and 43.8% students opined that the vaccine was not licensed for males. About 81.5% participants told that routine screening through PAP smear was required after HPV vaccination [Table 3].

Among study participants, 86.3% were aware that, both bivalent and quadrivalent vaccines were available in India and 10.3% participants did not know about the types of the vaccines. About dosage schedule of HPV vaccine, 67.6% students correctly answered about the schedule of quadrivalent vaccine, while 11.1% did not know about the schedule. Majority of students could not tell the correct schedule of bivalent vaccine. Regarding vaccine dose, about 85.6% students knew about correct dose of the vaccine and 14.4% did not know about it. Among the study participants, maximum students did not have any knowledge regarding the correct site of vaccination, about 64.4% participants told that the site of the vaccination was gluteal region, 26.7% participants said that it was deltoid region. About 91.1% students were aware about the route of administration of vaccines as intramuscular [Table 4].

Attitude of the Students toward HPV Vaccination

About 87% of the students showed their willingness to receive HPV vaccine. Lack of knowledge (44.52%) was found to be

Table 2: Knowledge of study population regarding carcinoma cervix ($n=146$)

Questions	Responses	Frequency (%)
Cause of cervical cancer	Virus	146 (100)
Common strains of HPV causing ca cervix	9 and 11	0
	6 and 17	0
	9 and 16	2 (1.4)
	16 and 18	144 (98.6)
Transmission of HPV is by	Blood transfusion	3 (2.1)
	Sexual route	134 (91.8)
	Injection	7 (4.8)
	Don't know	2 (1.3)
HPV infects only females	Yes	6 (4.1)
	No	138 (94.5)
	Don't know	2 (1.4)

HPV: Human papillomavirus

the most important obstacle for receiving HPV vaccination followed by doubt about effectiveness (34.24%) and high cost (18.4%). The most common source of information for the study population was teachers and textbooks (45.9%). Other sources of information included internet 23.3% and friends 8.9%. 20.5% participants mentioned multiple sources of information. About 81.5% of the study participants had been questioned by friends and relatives regarding HPV vaccination [Table 5].

DISCUSSION

The mean age \pm SD of the students who participated in the study was 22.73 ± 2.13 years. In the present study student's awareness about etiology of cancer cervix was 100%. About 98.6% of students knew about the high-risk strains of HPVs causing cancer. The awareness about preventable nature of cancer cervix among study participants was 93.8% and 92.5% students knew that the vaccine is available in India. About 87% of students wanted to be immunized with HPV vaccine. Lack of knowledge (44.52%) was found to be the most important obstacle for receiving HPV vaccination followed by doubt about effectiveness (34.24%) and high cost (18.4%).

Most of the participants in this study were well aware of the viral etiology of cervical cancer. Similar findings were observed in a study conducted among final year undergraduate students by Challa *et al.*^[13], study by Mehta *et al.*^[14] Similar findings were also observed in other studies conducted at different places.^[15,16] Majority of students in

Table 3: Knowledge of study population regarding HPV vaccine ($n=146$)

Questions	n (%)		
	Yes	No	Don't know
Can cervical cancer be prevented by a vaccine?	137 (93.8)	6 (4.1)	3 (2.1)
Is the HPV vaccine available in India?	135 (92.5)	11 (7.5)	0
Is HPV vaccine part of a national program?	32 (21.9)	111 (76)	3 (2.1)
Do women have to be tested before HPV vaccination?	35 (24)	110 (75.3)	1 (0.7)
Can HPV vaccine be given to sexually active women?	121 (82.9)	25 (17.1)	0
Does HPV protect against those already infected?	41 (28.1)	105 (71.9)	0
Does HPV protect against other disease forms?	116 (79.5)	27 (18.5)	3 (2.1)
Is HPV vaccine is licensed for males	73 (50)	64 (43.8)	9 (6.2)
If routine screening through PAP smear is required after HPV vaccination?	119 (81.5)	27 (18.5)	0

HPV: Human papillomavirus

Table 4: Knowledge of study population regarding HPV vaccine (n=146)

Questions	Responses	Frequency (%)
Types of HPV vaccine available	Bivalent	4 (2.7)
	Quadrivalent	1 (0.7)
	Both	126 (86.3)
	Don't know	15 (10.3)
Dosage schedule of HPV quadrivalent vaccine (months)	0, 1, 6	3 (2.1)
	0, 2, 6	99 (67.6)
	1, 2, 6	28 (9.2)
	Don't know	16 (11.1)
Dosage schedule of HPV bivalent vaccine (months)	0, 1, 6	2 (1.4)
	0, 2, 6	60 (41.1)
	1, 2, 6	68 (46.4)
	Don't know	16 (11.1)
Dose of vaccine	0.1 ml	0
	0.5 ml	125 (85.6)
	1 ml	0
	Don't know	21 (14.4)
Site of vaccination	Deltoid	39 (26.7)
	Gluteal	94 (64.4)
	Anteriolateral aspect of thigh	0
	Don't know	13 (8.9)
Route of administration	IM	133 (91.1)
	ID	2 (1.4)
	SC	3 (2.1)
	IV	2 (1.4)

HPV: Human papillomavirus

this study had knowledge that cervical cancer is preventable through a vaccine. This finding was consistent with the study conducted at premier medical school by Pandey *et al.*,^[17] Tripathy *et al.*,^[18] and others.^[13,19] However, in the study conducted by Seshaiyengar *et al.*^[20] at Bangalore, knowledge was found to be less than our study. Nearly 1/3rd of the study population were not aware of the presence of a vaccine for HPV in a study by Snigdha and Devi.^[21] In this study almost all students were aware about the common strains of HPVs causing cancer, and majority of students knew that sexual transmission was the common mode of transmission of the virus. The findings were similar to the findings of the study by Challa *et al.*^[13] and Seshaiyengar *et al.*^[20] The correct mode of transmission of HPV was known by 79.3%, and only 40.2% knew the carcinogenic strains in a study by Snigdha and Devi^[21] which is quite similar to our study findings. However, in the study conducted by Tripathy *et al.*^[18] and Mehta *et al.*^[14] correct response to the mode of transmission was only 25% and 38%, respectively, which was very less in comparison

Table 5: Attitude of study population towards HPV vaccination (n=146)

Questions	Responses	Frequency (%)
Would you like to receive HPV vaccine?	Yes	127 (87)
	No	6 (4.1)
	Don't know	13 (8.9)
What is the reason preventing you to receive or advice HPV vaccination?*	High cost	27 (18.4)
	Side effect	35 (23.97)
	Doubt about effectiveness	50 (34.24)
	Lack of knowledge	65 (44.52)
Source of information for you on HPV vaccine**	Teachers and textbooks	76 (52.05)
	Internet	54 (36.98)
	News paper and TV	12 (8.21)
	Friends	23 (15.7)
Any of your friends or relatives asked you about HPV vaccination till now?	Yes	119 (81.5)
	No	27 (18.5)

**Multiple responses. HPV: Human papilloma virus

to our study. Most of our study participants replied that women did not have to be tested before vaccination, but this finding was contrary to the study conducted by Kumar *et al.*^[19] Where 60% students replied that screening for cervical cancer was necessary before vaccination. About 79.5% of students in this study were aware that HPV can cause other diseases also. This finding was consistent with the study conducted by Snigdha and Devi^[21] where responses were 66%. In the study conducted by Mehta *et al.*^[14] 44% of the students answered that HPV causes vulval, penile, oral, and vaginal cancers which were lower than our study. Around 81.5% of our study participants replied that routine screening through PAP smear was necessary after HPV vaccination. This finding was similar to the studies conducted by Kumar *et al.*^[19] and Challa *et al.*^[13] where response were 80% and 74.8%, respectively. In this study, most of the students (86.3%) were aware that two types of vaccines are available. This finding was similar to the study by Challa *et al.*^[13] About 85.6% students correctly knew the dose of the vaccine. There was poor knowledge of our study participants about the site of HPV vaccination, but 91.1% participants could correctly tell the route of administration of the vaccine. In the study by Kumar *et al.*,^[19] approximately 50% of the students were not aware of the type of vaccine, number of vaccine subtypes, route, number of doses, and booster requirements. The route, site, and dose of HPV were not known correctly by a major proportion of medical students by Mehta *et al.*^[14] For our study population, the most common source of information

was textbooks and teachers followed by internet, friends. Around 87% of the students were willing to get vaccinated. The major obstacles to prevent them from vaccination against HPV were lack of knowledge, followed by doubt about effectiveness, and high cost. These findings were nearly similar to the studies conducted by Pandey *et al.*^[17] and others.^[13,21] However, in the study by Seshaiyengar *et al.*^[20] the main source of information of HPV vaccine was health education events (23.7%), followed by mass media (19%). This finding was also not supported by Tripathy *et al.*^[18] as in their study only 36.1% of students were ready to give consent for vaccination as compared to 63.9% of students who were not willing for vaccination. In the developing country like India, where cancer cervix is a prevalent disease, awareness regarding the disease, its screening facilities, and availability of its vaccine, is very much important to reduce the burden of the disease in the community. Medical students being future doctors can definitely play a major role to increase awareness about the disease among people and also they can advise vaccines to them.

Limitations of the study were that the sampling method was convenient sampling. Medical students from only one government medical college were included in the study. It may not reflect the overall awareness and knowledge of medical students in India. We have included only female medical students in our study sample; this may have biased the result of the study.

CONCLUSION

There is still a lack of knowledge about HPV vaccine and its acceptance even among medical students. There may be more ignorance among general public. Overcoming this gap is necessary if we want to decrease the burden of cervical cancer in India. The information regarding HPV vaccine must be included early in the medical education curriculum. Health education programs, group discussions and forums should be organized, where aspects of HPV infection, its association with cervical cancer and the HPV vaccine is clearly highlighted and doubts clarified.

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