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Knowledge of pre-invasive cervical cancer and its prevention using HPV vaccine among first-year school of midwifery students, FMC Nguru, Yobe State, northeastern Nigeria

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Abstract

Background: Pre-invasive cervical cancer is a precursor of cervical carcinoma if left untreated it takes about ten to twenty years for the pre-invasive lesion to develop into cervical cancer. It starts from cervical intraepithelial neoplasia, which constitutes CIN 1 CIN 2, and CIN 3, with the latter covering the entire thickness of the epithelium. The prevalence of pre-invasive cervical lesions was 7.7% in Makurdi north-central Nigeria, 4.8% in Zaria Northwestern Nigeria, and 7.7% in Egypt. Progressive infection with high-risk HPV in over 95% are associated with CIN and cancer of the cervix, fortunately, these viruses can be prevented using HPV vaccines if given appropriately and to the right population.
Method: The study was a cross-sectional type aimed at exploring the knowledge of the participants on the pre-invasive cervical lesions and their prevention using the HPV vaccine using a semi-structured questionnaire in FMC Nguru.
Results: The total number of participants was 29 (n=29). The mean age of the respondents was 20.9 +/-2. 8SD. Among the participants, 19 (65.5%) are aware that pre-malignant cervical cancer can progress to cancer of the cervix, and 9(31%) are aware that pre-malignant cervical lesions, can be asymptomatic. Only 13(44.8%) are aware that Human Papillomavirus is a risk factor for CIN whereas 21(72,4%) are aware that HPV can be prevented using a vaccine.
Conclusion: There is good knowledge among the students on the pre-invasive cervical lesion of the cervix and its vaccine prevention, however, the majority are not aware that HPV is an important risk factor for CIN, hence more work needs to be done to enlighten the students on this to enhance the acceptability of the human papilloma vaccine.

Keywords: Pre-invasive cervical Cancer, HPV Vaccine, FMC Nguru.

Introduction

Pre-invasive cervical malignancy is a relatively common problem, particularly in women within the reproductive age group. In America, more than 1 million women are detected to have LSIL, and about 500,000 have HSIL.[1] The prevalence of pre-invasive cervical lesions was 7.7% in Makurdi, north-central Nigeria[2] and 4.8% in Zaria Northwestern Nigeria[3] and 7.7% in Egypt.[4] Pre-malignant cervical lesions and cervical cancer are linked to Progressive infection with high-risk humanpapilloma virus in over 95% of cases. The pre-malignant cervical lesion is a progressive

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pathology that starts as an abnormal lesion in the transformation zone of the cervix. Progression to cancer may take 1.5 to 2 decades.[5] However, progression may be faster in immuno compromised individuals, probably in 1 to 2 years. Papanicolaou started the pap smear test on the cervix. His landmark publication in collaboration with H. F. Traut "Diagnosis of Uterine Cancer by the vaginal smear" in 1943 paved the way to diagnose uterine cervical lesions with the help of a simple and effective method.[6] In 1951, Ayres first described and illustrated squamous epithelial cells with a perinuclear "halo" in smears of the uterine cervix.[7] Then 1966, Richard described; CIN I, 11 and 111. Based on the level of dysplasia, CIN 1 is mild, and CIN 2 and 3 are moderate and severe respectively. These grades can either regress, progress or persist.[8] With further research on cervical carcinogenesis, in 1988 the Bethesda System (TBS) was introduced, it has 2 categories, low-grade SIL (LSIL) equivalent with CIN 1 and high-grade SIL (HSIL) equivalent with CIN 2 and 3.[8] The majority of women with cervical cancer live in rural areas.[9] Ethiopia is number 14th, followed by Malawi from the East African Countries.[10]

The causes of many cancers remain unknown, however, use of tobacco, excess body weight, transmitted genetic aberrations, hormones, and immune conditions are some of the established causes.[11] In Nigeria, cancer of the cervix is ranked as the second most frequent cancer among women after breast cancer, and also the second most frequent cause of cancer deaths among women aged between 15 and 44 years. In 2020, the country recorded 12,000 new cases and 8,000 mortalities fromcancer of the cervix.[12]

Cervical cancer may have a variety of clinical presentations. It may be incidentally detected at PAP smear examination of the cervix or there may be abnormal vaginal bleeding, fowl smelling vaginal discharge, cervical or even vaginal mass which may bleed on contact, or symptoms of metastasis. The cancer can spread to the lymph nodes, bladder, rectum, kidneys, liver, chest, and even the brain. Endophytic cervical cancer is also a possibility where the lesion grows inward into the uterus and infiltrates the mucosal walls. The cervical squamous epithelium may be unaffected hence there may not be contact bleeding and there may not be any visible surface tumor.[13] Human papillomaviruses play a significant role in the cause of CIN and subsequent cervical cancer. Greater than 150 HPV types have been discovered out of which 15 are high-risk, and cause cervical cancer, types 16, 18, 45, 31, 33, 52, 58, and 35 accounts for over 95% of cervical squamous cell cancers.[14] The low-risk HPV are 6 and 11 and are linked with 90% of cases of the genital wart and recurrent respiratory papillomatosis, etc, these conditions are mostly benign. On the cervical epithelium, the high-risk HPV effect may be transient and cleared by the host immune system, or persist to precancer and then later cancer. The carcinogenesis is mediated by two viral proto-oncogenes; E6 and E7.[15]

The E6 attacks the p53 DNA repair gene, resulting in loss of apoptosis, while E7 attacks the pRb (its normal function is normally hypophosphorylated and decreases or inhibits the cells from entering the S phase), causing the cell to enter the S phase of the cell cycle prematurely, and through the E2F pathway, it leads to increase in expression of more E6 and E7.[16] Majority of cases of pre-invasive cervical lesion and cancer of the cervix, may be prevented through the use of human papillomavaccine. The vaccine protects against human papillomaviruses types 6, 11, 16, and 18 (Gardasil®, Merck), and the bivalent vaccine is protective against human papilloma types 16&18(Cervarix®, GlaxoSmithKlineBiologicals).[17] Two doses of 0.5mls/I MOF HPV vaccine should be given at 0 and 6 to 12 months, for girlsaged[9] years to 14 years,

If the second dose was administered less than five months after the first, the dose should be repeated a minimum of 12 weeks after the second dose and a minimum of five months after the first. Individuals initiating the vaccine series at 15 years of age or older, for this group, three doses of human papilloma vaccine are scheduled at 0, 1 to 2 (typically 2), and 6 months.

The minimum period from the first two doses is four weeks, from the 2nd and 3rd scheduled doses is 12 weeks, and from the 1st and 3rd doses is five months. Repeat a dose if one receives it at a shorter interval than expected.

For immunocompromised patients, three doses of the human papillomavirus vaccine are required at zero, one to two, and six months irrespective of age.

Human papilloma vaccine is not administered during pregnancy, because its safety has not been established but can be given during breastfeeding. If a pregnant is mistakenly given the vaccine, she should be reassured. Nevertheless, the remainder of the doses should not be given until later after pregnancy.[18]

Cancer of the cervix screening is still necessary after HPV vaccination. The vaccine is designed to prevent cancer of the cervix by stimulating the body's immunological mechanism to make antibodies that will prevent the virus from infecting the woman. The vaccine does not cover all the virulent HPV strains, hence the need for continuous PAP smears even after the vaccination.[19]

The human papilloma vaccine was first introduced in Nigeria in 2009, but more than ten years after, the vaccine uptake is still low. There is generally low awareness of human papillomavirus and its vaccine among parents, this may ultimately affect the acceptability of the vaccine by the parents and by extension their children.[16,17] In Nigeria now, human papillomavirus vaccines are mostly found in private health facilities, and are too costly, there is also a low positive commitment from the Nigerian government to making sure that the HPV vaccine reaches the affected population.[20]

Materials and Methods

The study was a cross-sectional type, conducted at FMC Nguru, Yobe State, North Eastern Nigeria. The health facility is a tertiary health Centre that covers the state and also receives referrals from neighbouring Jigawa State and even Niger Republic. The hospital renders preventive, promotive, and rehabilitation services. It is also running a school of nursing and midwifery program, from where the study population was obtained, they were first-year midwifery students who came into the gynaecology ward for their routine posting and consented to fill out the questionnaire. A designed proforma was used to obtain this information from the participants after obtaining verbal consent, covering their biodata, their basic knowledge of pre-invasive cervical cancer, its causes, symptoms, and prevention using the HPV vaccine, and its acceptability.

Data cleaning was done and was then analyzed using the SPSS version 21 statistical software package. The socio-demographic data was presented with descriptive statistics. Association between variables was done using Fisher's exact test. All levels of statistical significance were set at $P<0.05$.

Table 1: Sociodemographic characteristics of respondents

Variable	Freq	%	Mean/SD	p-value
Age				
17- 18	5	17.24		
19 – 20	10	34.48		
21 – 22	9	31.04	20.52 ± 2.1 SD	<0.05
23 -24	5	17.24		
Religion				
Islam	24	82.80		
Christianity	5	17.20		
Tribe				
Hausa	14	48.30		
Fulani	7	24.10		
Kanuri	4	13.80		
Others	4	13.80		
Marital Status				
Married	2	6.90		
Single	27	93.10		

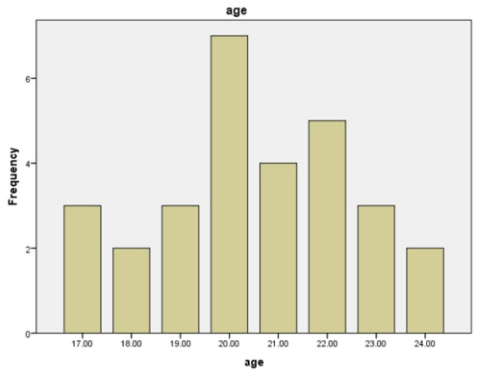

Fig 1: Above showed a bar chart showing the distribution of the participants by age, those between the ages of 20 and 22 had the highest number

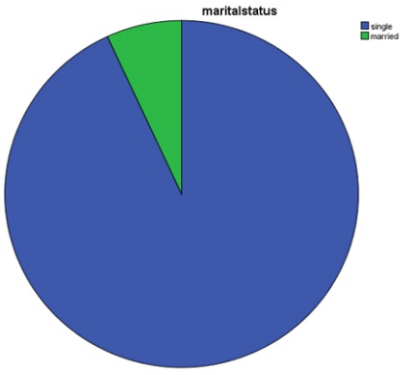

Fig 2: Above showed a pie chat depicting the marital status of the women, more than 93% of the women where unmarried, probably waiting to finish their educational pursuit

Results

The age range of the participants was 17-28, with the mean age being 20.9+/- 2.8 years. Twenty-four of participants were Muslims, 82.8%, whereas 5(17.2%) were Christians.

Concerning the knowledge of pre-invasive cervical cancer, 27(93.1%) which is quite a good number are aware of pre-invasive cervical lesions, but only 19(65.5%) are aware that pre-invasive cervical cancer can progress to frank or invasive cervical carcinoma. Pertaining factors associated with an increased risk of pre-invasive cervical carcinoma and cervical cancer, 20(69%) are aware that multiple sexual partners are associated with cervical cancer, and only 1(41.4%) are aware that having sex at a younger age is associated with cervical cancer. Most of the respondents are not aware that smoking is a risk factor for cervical cancer, 25(86.2%), whereas a good number of the participants, 22(75.9%) are aware that having a pregnancy at an early age can predispose one to having cervical cancer. Having many children is not known by most of the participants, 18 (62.1%), to be associated with an increased risk of cervical cancer. Participants generally have a fair knowledge of the presenting features of cervical cancer. Twenty-three of the respondents (79.3%) are aware that post-coital bleeding, fowl smelling vaginal discharge, and inter-menstrual or postmenopausal bleeding are features that may suggest cervical cancer, but the majority of the participants,20(69.0%) are not aware that pre-invasive cancer of the cervix can be asymptomatic. However, surprisingly, most of the respondents are aware that HPV can be detected even in asymptomatic women. Human papillomaviruses are associated with more than 99% of cases of cervical cancer, but unfortunately, this is only known by 13(44.8%) of the respondents. A good number of the participants are aware that HPV can cause other conditions like; oral, vulval, penile, and neck cancers, 17(58.6%) while 14(48.3%) are not aware that HPV may cause genital warts. The majority of the respondents 19(65.5%) are aware that pre-invasive cervical lesions can be detected, eleven of the participants (37.9%) indicated PAP smear as the detection method while 6(20.7%) indicated HPV DNA as the method, with VIA and VILI having the lowest score as methods known to the participants for pre-malignant cervical cancer detection. Twenty-two, 22 (75.9%) of the respondents have not had any of the screening tests mentioned above Most of the students 21(72.4%) are aware that human papillomaviruses can be prevented using vaccines, the predominant source of information being teachers from their school 9(31%), some had it through the social media 6(20.7%) and least through Televisions, Radio, and friends. Fifteen of the participants (51.7%) are aware that human papilloma vaccine can be obtained in Nigeria. Concerning the attitude of the respondents toward the HPV vaccine, 25(86.2%) of the respondents have not had any HPV vaccine and 27(93.1%) are willing to avail themselves of cervical screening so also 24(82.8%) are ready to have the HPV vaccines administered to them to prevent the pre-invasive cervical lesion whenever it is available and accessible freely in the country. Twenty-seven 27(93.1%) of the participants are also willing to advise their friends or relatives to have the vaccine. In case a pre-invasive malignant cervical lesion has occurred in a patient, 26(89.7%) of the respondents are aware that it can be treated early. There was no significant association between marital status and knowing that HPV is a risk factor for pre-invasive cervical lesions (Fisher's exact test,1.000, P value,0.722)

Discussion

This research aimed to investigate awareness of pre-invasive cervical neoplasia and its prevention using the HPV vaccine among the first-year school of midwifery students in FMC Nguru, North-western Nigeria. Midwives play pivotal roles in health promotion and the prevention of diseases. Consequently, their level of knowledge and acceptance of HPV vaccination may have a direct impact on their own and their clients' health promotion activities. Pre-invasive cervical cancer is a precursor of cervical carcinoma and if left untreated, it can take about ten to twenty years for the pre-invasive lesion to develop into cancer of the cervix. It starts from cervical intraepithelial neoplasia, which constitutes CIN1, 2, and 3. The prevalence of CIN, was 7.7% in Makurdi north-central Nigeria, 4.8% in Zaria Northwestern Nigeria, and 7.7% in Egypt. Progression of the disease to malignancy is seen in 95% of patients

with high-risk HPV, fortunately, these viruses can be prevented using HPV vaccines if given appropriately and to the right population. This is the first time in the history of medicine that a cancer can be prevented by vaccination. The development of the HPV vaccine represents a huge advancement in the fight against cervical cancer. The respondents had good knowledge of pre-invasive cervical cancer, 27(93.1%) and also 19(65.5%) are aware that pre-invasive cervical cancer can progress to frank or invasive cervical carcinoma, this is almost similar to the findings by Getaneh A. in Ethiopia (59.3%)[21] but much higher than the findings from Lagos by Amu EO (44.2%).[22] The reason for the high rate of this awareness among the participants was perhaps because they are health students and got the majority of their source of information from their teachers as seen from our findings. A very good number of the respondents are aware of the risk factors associated with pre-invasive cervical cancer and subsequent cervical cancer; this is similar to the findings by Elshami E. et al, in Palestine.[23] Similarly, most of the respondents have good knowledge concerning features with which cervical cancer may present, this is similar to the findings by Rancic NK, et al in Serbia, they found outthat the level of awareness of cervical cancer among medical students is high.[24] Human papillomaviruses are associated with more than 99% of cases of cervical cancer, but unfortunately, this is only known by 13(44.8%) of the respondents, this is almost similar to the findings among nurses in Spain by Borrull GJ.[25] The majority of the respondents 19(65.5%) are aware that pre-invasive cervical lesions can be detected, this is much higher than the findings by Maanongun MT, et al, in Makurdi (3.3%), this is probably because they conducted their study on the non-medically related undergraduate student. Most of the students 21(72.4%) are aware that human papillomaviruses can be prevented using vaccines, this is similar to the findings by Pellulo CP, who conducted his research in Italy among nursing students (76.8%).[27]

Conclusion

The respondents have good knowledge of pre-invasive cervical cancer and also know that the human papillomavirus vaccine can be used to prevent pre-malignant cervical lesions. However, a good number of them paradoxically do not know that the human papillomavirus is associated with cancer, hence continued health education is very important concerning premalignant cervical lesions and their prevention to this group of participants because of their significance in the health sector, and also to the larger population.

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