

Overview and Prevention of Cervical Cancer

Type of Article: Review

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ABSTRACT

BACKGROUND

Cervical cancer though a preventable disease, still has an estimated mortality of 80% from invasive cervical cancer in developing countries. The aim of this paper is to present an overview of cervical cancer and the various modalities available for screening and prevention of cervical cancer.

METHODOLOGY: *Google search and review of the literature of published works on overview of cervical cancer and its various modalities for screening and prevention were utilised.*

RESULTS

The incidence, aetiology, risk factors, clinical features, management and prevention of cervical cancer in Nigeria and as compared worldwide is presented. The reduction in incidence and mortality of cervical cancer in developed countries is related to the fact that cervical cancer screening is well institutionalized.

CONCLUSION

Cervical cancer is the commonest genital tract malignancy in Nigeria. It is a sexually transmitted infection caused by the HPV. It is preventable! Vaccination against HPV is available worldwide and in Nigeria. It is thus imperative that the general public and medical personnel in particular appreciate the clinical importance of cervical cancer; and effectively outline the modalities for preventing cervical cancer; and thus

advocate for institutionalizing cervical cancer screening activities in the Nigerian setting.

KEYWORDS

Cervical cancer; Pap smear; HPV; Nigeria.

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INTRODUCTION

Cervical cancer is the second most common cancer in the world, with about 2.3 million prevalent cases and 530 000 incident cases each year¹. Annually, about 288 000 women die of cervical cancer; with 80% of these deaths occurring in low- resource countries² where it is the most common cause of cancer death³. This is particularly disturbing trend because cervical cancer is a preventable disease and screening modalities abound. Cervical cancer is the commonest gynaecological malignancy in Nigeria; accounting for 62.3% of all genital tract malignancies seen in University of Port Harcourt Teaching Hospital⁴, 70.5% in Maiduguri⁵, 60.1% in Sokoto⁶ and 63.1% in Illorin⁷. Cancer of the cervix is a leading cause of death and nearly two thirds of healthy years lost by women in developing countries are lost because of cervical cancer⁸.

Cervical cancer is cancer arising from the cervix. The cervix is part of a woman's reproductive system located in the pelvis. The cervix is the lower, narrow part of the uterus (womb) that acts as a passageway connecting the uterus to the vagina^{9,10,11}. During a menstrual period, blood flows from the uterus

through the cervix into the vagina^{9,11}. The vagina leads to the outside of the body.

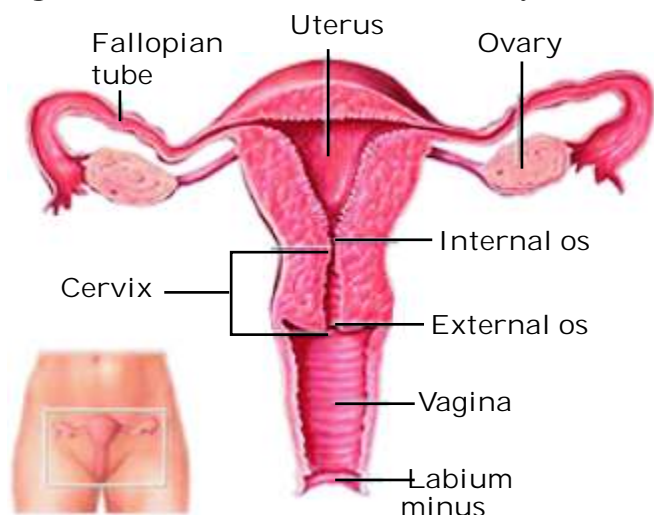


Figure 1: Diagram of the cervix with its surrounding structures. Courtesy Medscape

The cervix secretes mucus, which during sexual intercourse, helps sperm move from the vagina through the cervix into the uterus^{11,12}. During pregnancy, the cervix is tightly closed to help keep the baby inside the uterus. During labour / childbirth, the cervix dilates / opens to allow the baby to pass from the womb to the outside world through the vagina¹¹. Most cervical cancers begin in the cells lining the cervix. These cells do not suddenly change into cancer. Instead, the normal cells of the cervix gradually develop pre-cancerous changes that turn into cancer¹¹. These pre-cancerous changes include cervical intraepithelial neoplasia (CIN), squamous intraepithelial lesion (SIL), and dysplasia^{13,14}. These precancerous changes, which can be prevented by vaccination against the causative human papilloma virus, can also be modified by safe sex practices such as mutual fidelity and avoidance of multiple sexual partners. These precancerous changes can be detected by the Papanicolaou test and treated to prevent cancer from developing^{1,11,13}. If detected early, pre-invasive cervical cancer is one of the most successfully treatable cancers^{1,9,11}. Thus it is so important for women to get regular Papanicolaou (Pap) smears. Most women who are diagnosed with cervical cancer today have not had regular Pap smears or they have not followed up on abnormal Pap smear results¹.

Undetected precancerous changes develop into cervical cancer and can spread to the bladder, intestines, lungs, and liver^{1, 9,11,14}. It can take years for precancerous changes to turn into cervical cancer. Patients with cervical cancer do not usually have problems/symptoms until the cancer is advanced and has spread^{1,9,11,13,15}.

Available evidence supports the conclusion that cervical screening offers protective benefits and is associated with improved well being and a reduction in the incidence of invasive cervical cancer and cervical cancer mortality^{1,16,17,18,19}. Screening is especially important for cervical cancer, because even limited superficial invasion (3.0 mm of invasion or more) has metastatic potential.²⁰

It is thus imperative that the general public and medical personnel in particular appreciate the clinical importance of cervical cancer and effectively describe the modalities for preventing cervical cancer. All medical personnel should endeavor to appropriately refer or offer females papsmear testing & Human Papilloma Virus (HPV) vaccination; as the early recognition and referral of the patient presenting with cervical cancer is an important step in its prevention.

The reduction in incidence and mortality of cervical cancer in developed countries is related to the fact that the cervix is accessible to direct visualization and sampling^{21,22}.

Therefore, the diagnosis of cervical dysplasia is easily achieved through cervical cancer screening.

In the United States, the cervical cancer death rate declined by almost 70% between 1955 and 1992, in large part due to the effectiveness of Pap smear screening²¹; Nigeria can achieve this feat if all health personnel and the general populace can understand the clinical importance of cervical cancer and the modalities for prevention and screening. If this is achieved the negative statistics of cervical cancer in Nigeria may then become similar to

what obtains in the United States and other developed countries where screening for cervical cancer is the norm and death from invasive cervical cancer is a rare phenomenon. The aetiology, risk factors, clinical features, management and prevention of cervical cancer in Nigeria and as compared worldwide is presented below.

Aetiology

Almost all cervical cancers are caused by HPV (human papilloma virus)^{1,11,13}. HPV is a common virus that is spread through sexual intercourse and has various serotypes. The oncogenic or high-risk HPV types like 16 and 18 result in cellular changes (dysplasia) that, if untreated, result in cervical cancer¹³, while the low-risk HPV types like 6 and 11 cause genital warts.

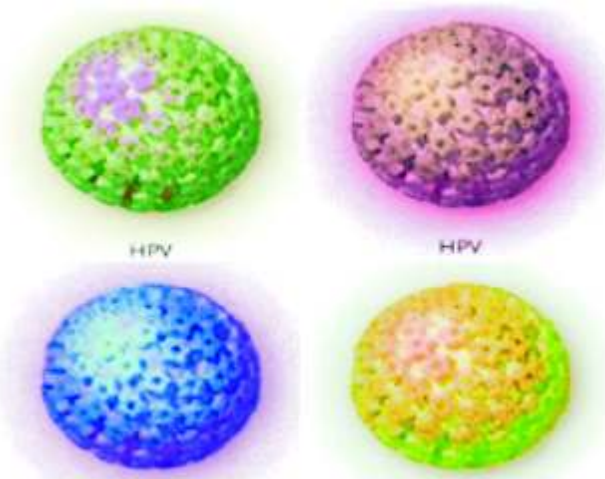


Figure 2: HPV Serotypes. Courtesy Medscape

Risk Factors for Cancer of the Cervix

The risk factors for cancer of the cervix includes having sex at an early age as well as, or having multiple sexual partners, a sexual partner who has multiple partners, or who participate in high-risk sexual activities^{1,11}. High-risk sexual activities increase the possibility of being infected with the HPV^{1,11}. Long-term use of oral contraceptives increases the risk of developing cervical cancer but the benefits of taking oral contraceptives far outweigh the risks for the majority of women^{1,21}. Multiparity is another risk factor for cervical cancer; women with a late first pregnancy have a lower risk of developing cervical cancer than those with an early first

pregnancy^{1,9,11,21}. The risk increases with the number of pregnancies and is thought to be related to the changes the cervix normally undergoes during pregnancy.

Immune-compromised status: Women who are immunosuppressed (for example, women who are HIV positive, or those who are taking immunosuppressive drugs as occurs after an organ transplant,) are thought to be at increased risk of developing cervical cancer^{1,3}.

Smoking/tobacco use, alcohol use, unhealthy diet and physical inactivity are the main cancer risk factors worldwide^{1,22}.

Women who smoke are about twice as likely to develop cervical cancer as non-smokers^{3,22}. This is not only attributed to the association between smoking and high-risk health behaviours but also to the ability of smoking in suppression of the immune system allowing the persistence of high risk HPV infection. Consequently smoking cessation appears to help the clinical abnormalities to return to normal.

Exposure to the HPV can be minimized through vaccination of young women. Vaccination is most effective if given to young women before they become sexually active (primary prevention)^{22,23}. Precancerous cellular changes can be identified through screening, assessment of test-positive cases, and treatment (secondary prevention). The goal of secondary screening is to prevent cancer, but it may also identify cervical cancer at an earlier stage, which will increase the likelihood that treatment will be successful.

Clinical Features

Cervical cancer is usually asymptomatic until the cancer is advanced. Abnormal vaginal bleeding (between periods, after intercourse, contact or after menopause) may be the first symptom noticed. The menstrual periods may become heavier and last longer than usual and bleeding could occur between regular menstrual periods. Post coital or post contact bleeding i.e. after sexual intercourse, douching

or a pelvic examination, is suspicious of advanced cervical cancer²¹. Vaginal bleeding after going through menopause is also suspicious for cervical cancer. Watery vaginal discharge, which may be clear, pink, brown, bloody or foul, may be another symptom. Pelvic pain, pain during sex, back pain, bone fractures, fatigue, leaking of urine or feces from the vagina, loss of appetite, Single swollen leg, weight loss, etc. are all possible clinical features of cervical cancer.

Diagnosis

The diagnosis of cervical cancer is confirmed by histology^{11,13}. A well-taken history and examination is however the first step to making a diagnosis while investigations including examination under anaesthesia: staging & biopsy for histology clinches the diagnosis. Staging is imperative because the management modalities for cervical cancer are not similar across the various stages.

Staging

This is basically evaluating the extent (stage) of the disease to help choose the best treatment. Staging is a careful attempt to find out whether the tumor has invaded nearby tissues, whether the cancer has spread and, if so, to what parts of the body¹³. Cervical cancer spreads most often to nearby tissues in the pelvis, lymph nodes, or the lungs. It may also spread to the liver or bones. Staging for cervical cancer is based on clinical examination, rather than surgical findings. The following are necessarily used in determining the stage: inspection, palpation, colposcopy, endocervical curettage, hysteroscopy, cystoscopy, proctoscopy, intravenous urography, X-ray examination of the lungs and skeleton, and cervical conization^{11,13}.

The FIGO (International Federation of Gynaecology & Obstetrics) Staging¹³ system is simplified as shown below:

Stage 1 – Cancer limited to the cervix

- IA – microscopic
- IB – visible or macro > 5mm by 7mm

Stage II - Cancer invades beyond the cervix

- IIA – upper 2/3 of the vagina (no parametrial involvement)
 - IIB – Parametrium is involved
- Stage III – Cancer invades to pelvic sidewall or lower vagina
- A – lower 1/3 of the vagina
 - B – pelvic sidewall/hydronephrosis/non functioning kidney
- Stage IV – Cancer invades beyond the vagina
- A – bladder/rectal mucosa
 - B – distant metastasis

Treatment

The choice of treatment depends mainly on the stage of the cancer. The treatments for women with cervical cancer are surgery, radiotherapy, chemotherapy, or a combination of these¹³. For Stages 1 and 1A; surgery, radiotherapy or combined surgery with radiotherapy suffices while for Stages 1B to 1V, Radiotherapy and chemotherapy are the mainstay of treatment^{11,13}.

The treatment options may also depend on whether fertility preservation is required. A gynecologic oncologist; a surgeon who specializes in treating female cancers is the best specialist to refer the patient to. Other specialists who treat cervical cancer include gynecologists, medical oncologists, and radiation oncologists. The health care team may also include an oncology nurse and a registered dietitian.

Surgery is an option for women with Stage I or IIA cervical cancer. In radical trachelectomy: the cervix, part of the vagina, and the lymph nodes in the pelvis are removed^{11,13}. This option is for a small number of women with small tumors who want to try to get pregnant later on. In total hysterectomy: the cervix and uterus are removed while in radical hysterectomy: the cervix, some tissue around the cervix, the uterus, and part of the vagina are removed¹³. With either total or radical hysterectomy, both fallopian tubes and ovaries are removed (salpingo-oophorectomy). The surgeon may remove the lymph nodes near the tumor to see if they contain cancer. If cancer cells have reached the lymph nodes, it means

the disease may have spread to other parts of the body.

Radiotherapy is given as external beam radiotherapy to the pelvis and brachytherapy (internal radiation). Radiotherapy can be used to treat all stages of cervical cancer^{11,13}.

Chemotherapy is used for advanced disease and cisplatin-based chemotherapy is the drug of choice for cancer of the cervix^{11,13}.

Follow-up care

Cervical cancer patients will need regular checkups after treatment^{11,13,21}. Checkups help ensure that any changes in health are noted and treated if needed. It will also look out for the return of the cancer. Even when the cancer seems to have been completely removed or destroyed, the disease sometimes returns because undetected cancer cells remained somewhere in the body after treatment. Checkups include a physical examinations, Pap smears, chest x-rays and other ancillary investigations^{11,13,21}.

Prevention

The reduction in incidence and mortality of cervical cancer in developed countries is related to the fact that the cervix is accessible to direct visualization and sampling¹. Therefore, the diagnosis of cervical dysplasia is increased. Cervical cancer is a preventable disease^{1,9,15,21}. Vaccination exists against the causative HPV while pap smears detects dysplasia and early disease.

Vaccination And HPV Testing

Efficacy of vaccination is best when the vaccine is given prior to the onset of sexual activity and prior to exposure to HPV. All girls 9 years old or over should have access to the cervical cancer vaccine before they become sexually active^{22,23}. This is based on high quality of evidence assessment and a level 1-A classification of recommendation. A large randomized trial¹⁶ has shown that a single lifetime screening using HPV testing followed by intervention for test-positive cases can prevent cervical cancer. Unfortunately, HPV

testing is not widely available in Nigeria¹⁵.

Pap Smear.

A Pap smear (also called Pap test or Cervical smear) is a simple test used to look at cervical cells. Pap smears detect abnormal cells that can lead to cervical cancer^{11,13,21}. Finding and treating abnormal cells can prevent cervical cancer. Also, the Pap smear can help find cancer early, when treatment is more likely to be effective. Doing the Pap smear is not painful. It's an office or clinic procedure performed during a pelvic examination. A sample of cells is scraped from the cervix and smeared onto a glass slide. A pathologist checks the cells under a microscope for cytological changes^{11,13,21}. Most often, abnormal cells found by a Pap smear are not cancerous. The same sample of cells may be tested for HPV infection. In spite of the ease of performing a pap smear, the rate of pap smear in Nigeria has been found to be low. In contrast to this the uptake of Pap smear screening has been found to be higher in the absence of user fees²⁴.

Pap smear; cells are scraped from the cervix and examined under a microscope to check for cancer or other problems

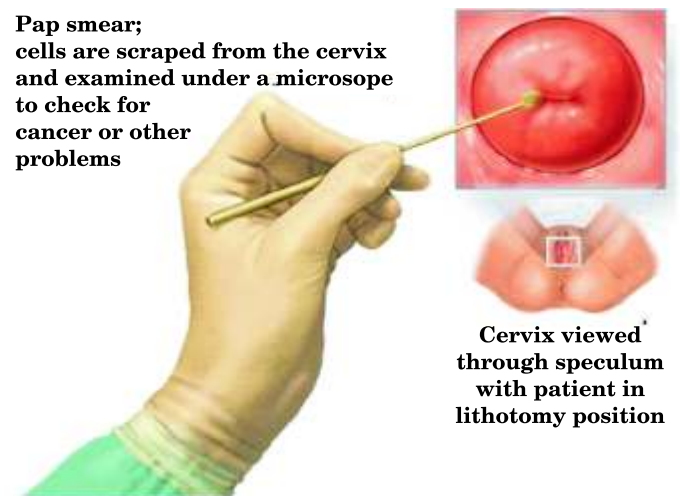


Figure 3: Pap smear

All cytological findings of the pap smear should be reported using the standard terminology set forth by the Bethesda system in 1998 with revisions in 2001¹⁴. Terminology included in this system¹⁴ describes the adequacy of the specimen, a general categorization of whether the specimen is within normal limits or not, and a description of cytological dysplasia. Epithelial cell abnormalities are reported as atypical

squamous cells of undetermined significance (ASCUS), atypical squamous cells—cannot rule out high grade squamous intraepithelial lesion (ASC-H), low grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL), or squamous cellcarcinoma. Glandular lesions are reported as atypicalglandular cells (AGC), with the origin noted if possible (endocervix, endometrial, or not otherwise specified), AGC favor neoplastic, adenocarcinoma in situ (AIS), or frank adenocarcinoma¹⁴. It is important to have knowledge of this system so that reports of Pap smears can be critically appraised for acceptability.

Abnormal Pap/HPV test results require further analysis^{11,13}. Colposcopy is further used to look at the cervix. The colposcope combines a bright light with a magnifying lens to make the tissue easier to see. It is also an office/clinic procedure. A biopsy can also be taken and sent for histology whereby a pathologist views the tissue under a microscope for abnormal cells. A biopsy can also be done using a punch (punch biopsy), an electrical loop (loop electrical excision procedure LEEP), and endocervical curettage^{11,13}. A cone biopsy can also be done in theatre.

Visual Inspection

Visual inspection of the cervix either aided, unaided or with acetic acid is another cheap option for use in low resource settings.

Awareness

Early detection saves lives! Awareness / Sensitization Health Campaigns¹⁵ during Town hall meetings or any other gathering can be used effectively to sensitize the populace, to create awareness about cervical cancer and to encourage the populace to go for screening.

CONCLUSION

Cervical cancer is the commonest genital tract malignancy in Nigeria. It is a sexually transmitted infection caused by the HPV. It is preventable! Vaccination against HPV is available worldwide and in Nigeria. Pre-invasive stages are 100% treatable! Routine

Pap smear/HPV testing detects early disease. It is recommended that medical personnel and the lay public do more on a collective and individual basis create more awareness on cervical cancer with emphasis on it being preventable, the ease of screening and the application of preventive measures like HPV vaccination. Medical personnel should be encouraged to screen for cancer of the cervix or refer clients for vaccination/screening, to achieve early detection and early and appropriate referral which are key to prevention and cure.

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