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In this volume, sixteen (16) papers scale through the eye of the needle of the Editor-in Chief. The title of the papers in this edition are: Knowledge and utilization of oral rehydration therapy in the treatment of diarrhoea among under-five mothers in Lagos, Nigeria; **Prevalence and risk factors of neonatal jaundice in special care baby unit of Ahmadu Bello University Teaching Hospital Zaria, Nigeria**; Factors influencing teamwork performance among health workers in University College Hospital, Ibadan; Perceived effects of Aphrodisiac on women of Kaura ward, in Zaria city of Kaduna State, Nigeria; Umbilical cord care practices and management outcome among mothers in selected primary health centres in Mushin Local Government Area, Lagos State, Nigeria; Assessment of knowledge of sickle cell anaemia among primary health care workers in Zaria city, Kaduna State, Nigeria; Utilisation of postnatal care services among women of childbearing age in Primary Health Care Centres in Niger State, Nigeria; School Health: an analysis of boarding school clinic facilities in Kano State, Nigeria; **Perception of women towards teaching of sexuality education in secondary schools in Ibadan, Oyo State, Nigeria**; Effect of two assessment strategies on physiotherapist students competence in Cardiff University United Kingdom; Family Health a “Sine Qua Non” to effective maternal and child health care; Application of trans-theoretical model of health promotion and approaches to health promotion in tackling alcohol abuse; Cervical cancer screening among women: a tool for prevention of Cancer; Effect of training programme for school health nurses on adolescents decision-making on reproductive health in Ijebu Ode Local Government Area of Ogun State, Nigeria and Knowledge of nursing process and attitude of undergraduate nursing students towards its utilization in a Tertiary Health Institution, Edo-State, Nigeria. Knowledge of Psychological Distress and Post Partum Bues among Pregnant Women in Wesley Guild Hospital, Ilesa Osun State, Nigeria.

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# CERVICAL CANCER SCREENING AMONG WOMEN: A TOOL FOR PREVENTION OF CANCER

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## ABSTRACT

*Cervical cancer is a type of cancer arising from the cervix due to the abnormal growth of cells that have the ability to invade other parts of the body. It is one of the greatest threats to women's lives worldwide. It has been described as the second most prevalent cancer affecting women after breast cancer. An ideal screening test is one that is minimally invasive, easy to perform, acceptable to the women, cost-effective and efficacious in diagnosing the disease process in its pre-invasive state when the disease process is more easily treatable and curable. A variety of screening tests have therefore been developed in an attempt to overcome the innate limitations of conventional cytology. Currently, cervical cytology is widely regarded as the gold standard for cervical cancer screening in all developed countries. It is however not feasible to implement a systematic cytology based screening programme in a country like Nigeria. This is mainly due to severe restrictions on the availability of infrastructure, resources and funding. There is a need to develop low cost screening strategies for cervical cancer. Visual inspection with acetic acid (VIA) or Lugol's iodine (VILI) which is comparatively cost-effective while retaining adequate sensitivity and specificity is advocated. Many studies conducted across Nigeria have revealed low utilization of cervical cancer screening services among various categories of women in spite of the reported high level of awareness. Well planned and organized screening programs with high coverage of the "at risk" group could significantly reduce the number of new cases with cervical cancer and the mortality rate associated with it. The burden of this disease*

*can only be reduced and controlled by the implementation of evidence based preventive measures, early detection and proper case management.*

**Keywords:** Cervical cancer; Screening; Women; Prevention.

## INTRODUCTION

Cervical cancer is one of the greatest threats to women's lives. The primary cause of cervical cancer is infection with one or more types of high risk human papilloma virus (HPV) which is transmitted by sexual contact. Globally, cervical cancer has been described as the second most prevalent cancer affecting women worldwide after breast cancer, with an estimated 529,409 new cases and 274,883 deaths in 2011 (International Agency for Research on Cancer (IARC), (GLOBOCAN, 2015). Out of the new cases, 86 percent occurred in developing countries representing 13 % of female cancers (IARC, GLOBOCAN, 2015). The greatest burden occurs in the developing countries where the mortality rate ranges from 10 to 35 per 100,000 compared with two to four deaths per 100,000 in developed nations (Arbyn, Herbert, and Schenck, 2015). In Nigeria alone, an estimated 25,000 newly diagnosed cases of cervical cancer exist. About 75 percent of cancer cases report late to hospital and are thus diagnosed in the late stages when cure becomes elusive nations (Arbyn, Herbert, and Schenck, 2015).

Utoo and Utoo (2011) state that the burden of the disease can only be reduced and controlled by implementation of evidence based preventive measures, early detection and proper case management. The fact remains that all women of reproductive age particularly the

sexually active are at risk of development of cervical cancer. Studies by Kim, Edmunds and Goddred, (2015); Spayne, Ackerman, Milosevic and Seinfeld (2014) have shown that cervical cancer is almost completely preventable if detected and treated early. Many studies conducted across Nigeria have revealed low utilization of cervical cancer screening services among various categories of women in spite of reported high level of awareness among women (Ayinde and Omigbodun 2014; Aboyeji, Ijaiya and Buhari, 2014; Ogunbode and Ayinde, 2014). The use of the papanicolaou (pap) test in the early detection of cervical cancer has been proven to be very effective in the reduction of the disease rate. This is because women who develop cervical cancer are most often women who have not been appropriately screened and promptly treated (Gakidou, 2015; Murphy, Kennedy, Dunn, Fung, Gzik, McLachlin, Shier and Paszat, 2011). Experience from developed countries has shown that well planned and organized screening programs with high coverage of the "at risk" group could significantly reduce the number of new cases with cervical cancer and the mortality rate associated with it (Arbynet *al*, 2015). It has been observed that countries with regular screening programme have led to reduced incidence in some countries (Kim *et al.*, 2015). Screening through the use of pap - smear has resulted in reduction in cervical cancer mortality in developed countries (Feyi-Waboso, Kamunu, and Aluka, 2014). Therefore, the programme must reach and screen the target group in order to be successful.

## OBJECTIVES

Objectives are to:

- a) explain the concept of cervical cancer
- b) discuss factors affecting the effective utilization of cervical cancer screening
- c) discuss the essential tools to successful cancer screening.

- d) describe how cervical cancer screening is a tool for preventing cancer.
- e). discuss Nurses role towards cervical cancer screening

## CONCEPT OF CERVICAL CANCER

**Cervical cancer** can be defined as a type of cancer arising from the cervix due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body (Oche, Kaoje, Gana and Ango, 2013). Cervical cancer is a preventable cancer of the female genital tract. It is still a leading cause of cancer caused death among women in areas where organized screening is not available. The disease is caused by infection with persistent oncogenic human papilloma virus (HPV), which makes timely vaccination with HPV vaccine an effective primary prevention method. However, the cost of the vaccine makes it inaccessible in developing countries, thereby leaving secondary prevention through cervical cytology as the best alternative method of cervical cancer prevention (Denny, 2008). Most cervical cancers arise at the squamo-columnar junction and transformation zone between the columnar epithelium of the endocervix and squamous epithelium of the ectocervix where there is continuous metaplastic change (Krishnakumaret *al.*, 2011).

Several risk factors increase the chance of developing cervical cancer. Women without any risk factor rarely develop cervical cancer. Although these risk factors increase the odds of developing cervical cancer, many women with these risks do not develop this disease (American Cancer Society, 2019). The high burden of cervical cancer in developing countries, like Nigeria, is due both to a high prevalence of HPV infection and the lack of effective cervical cancer screening programmes (Ndikomand and Ofi, 2012). An important strategy towards the reduction of the

incidence and mortality associated with cervical cancer is by increasing the screening rate of women that have not been screened or those that screen infrequently (Dim, 2012).

### CAUSES OF CERVICAL CANCER

The invasive cervical carcinoma is known to develop after appearance of precursor lesions which is well-defined at the premalignant phase. This makes cervical cancer amenable to screening and early treatment. The early detection and treatment of the precursor lesion brings about a complete cure for cervical cancer. The exact cause of cancer of the cervix is not clearly defined, but certain risk factors are believed to have an effect. Medical history and lifestyle especially sexual habits play a role in the woman's chances of developing cervical cancer. Infection with distinct types of human papilloma virus (HPV) is the primary etiological factor in cervical carcinogenesis. Human papilloma virus may not be the only agent involved in causation of cervical cancer. Of the other agents examined, most attention has been focused on herpes simplex virus type 2 (HSV-2) and chlamydia which has been shown to increase the risk (Smith, Herrero, Rosett, Bosch, Eluf-Neto Caste Usagye, Meljer, 2014). Human Immune Virus (HIV) infection is another viral infection which has been found to increase the risk of high grade lesions of the cervix and thus increasing risk of cancer of the cervix. The effect is much higher among patients with both HIV and HPV (Possible interaction). This may explain why the younger women are reporting with advanced cancer of the cervix.

The progression from HPV infection to cervical cancer occurs over a series of four (4) steps: human papilloma virus (HPV) transmission, acute HPV infection, persistent HPV infection leading to precancerous changes, and intraepithelial cervical cancer

(ICC) (Schiffman, Wacholder, Castle, Jeronimo and Rodriguez, 2011). More than 40 HPV types can infect the cervix, human papilloma virus types 16 and 18 are responsible for approximately 70% of cervical cancer cases. The tremendous importance of HPV in cervical carcinogenesis has opened up possibilities for cancer prevention. Over the last decade, astonishing progress has been made in understanding the pathogenesis of cervical cancer. An overwhelming body of evidence shows that infection with distinct types of the human papilloma virus (HPV) is the primary risk or factor for the development of cervical cancer and its precursor lesions (Woodman, Collins, and Young, 2017).

### PREDISPOSING FACTORS

**Nutritional factors:** Airede, Nwobodo, Malawi and Tuana (2015) and Walraven (2016) found poor nutrition such as low intake of vitamins A, C, E, carotenoids and folate to be associated with cervical cancer development.

**Poverty:** A study conducted in Illorin, Nigeria by Aboyeji *et al.* (2014), show that of the 236 gynaecological malignancies recorded from 1990-1999, 149 are invasive cervical cancer cases, and 88.6% of the patients are of low socio-economic status.

**Circumcision:** Some researchers observe that women with partners who have been circumcised are less likely to get cancer. This may be because circumcised men are less likely to have HPV infection, (Cancer Research U.K, 2016).

**Multiple sexual partners or partner of an individual with multiple partners:** This is associated with repeated infection with the causative organism - human papilloma virus, the key factor in the development of cervical cancer. The use of condoms has also been associated with a reduction in cervical cancer development, (Cancer Research U.K., 2016).

**Alcohol consumption/ Smoking:** Consumption of alcohol has been associated with the development of cervical cancer, (Walraven, 2016). Researchers have found cancer causing chemicals (e.g. benzyrene) from cigarette smoke in the cervical mucus of women who smoke. They think these chemicals damage the cervix. There are cells in the lining of the cervix called Langerhans cells that specifically help to fight against disease. These cells do not work so well in smokers. If an individual has a 'high- risk' HPV infection and smokes, she is twice as likely to have pre-cancerous cells in her cervical screening test or to get cervical cancer, (Cancer Research, U. K, 2016).

**Women's Hygiene:** Researchers have found that risk of cervical cancer is almost half in women who had a bath shower six or more times a week when compared to women who bathed or showered 1-5 times a week. It has also been found that cervical cancer risk is probably higher in women with poorer hygiene because they are more likely to get a lasting HPV infection if they are exposed to the virus, (Cancer Research, U. K. 2016).

**Age at first coitus and marriage:** Studies conducted by Ajenifuja and Adepiti, (2011);Audu, Elnafaty and Pindiga (2017) on effect of age on utilization of cancer screening in various settings all show that teenage pregnancy was very high, with first pregnancy occurring before age 15 years. Airedeet *al.*(2015), report that most of their respondents have sexual intercourse and or married before age of 20 years (usually between 14-16 years). This has been found to be associated with the development of cervical cancer. The lowest age at marriage is 6 years, the patient involved presented with cervical cancer at 21 years of age in Sokoto, Nigeria (Airede *et al.*,2015).

**Prolonged use of oral contraceptives:** Walraven, (2016), in his study found that taking contraceptive pill could increase a woman's risk of developing cervical cancer. It is thought that 'the pill' was statistically linked

to cervical cancer because women on the pill are more likely to be sexually active and so more at risk of picking up HPV. Also they do not necessarily use condom or cap which could prevent them from picking up the HPV.

**Multi-parity:** Women in developing countries are at high risk of developing cervical cancer because they often have large families. Women who have had seven or more children have double the risk of developing cervical cancer compared to women with only one or two children. Having the first baby early before the age of 17 years also doubles the risk compared to having the first baby at 25 or older. Research has also shown a doubling of risk of squamous cervical carcinoma in women who have 3 or more children compared to women with no children.

**Genetics/ethnic groups and family links:** Epidemiologic studies suggest that some predisposing factors such as genetic heritability accounts for about 27 percent of the total variation in liability to cervical tumour development, (Rader, 2016). Studies have shown that black women with HPV are more likely to develop cervical cancer.

## **PATHOPHYSIOLOGY OF CERVICAL CANCER**

Cervical cancer refers to the malignant condition of the cervix. It is an abnormal proliferation of cells in the body. Cervical cancer may present with vaginal bleeding but symptoms may be absent until the cancer is in its advanced stage.

**Transformation Zone:** Cancer of the cervix typically originates from a dysplastic or premalignant lesion previously present at the active squamocolumnar junction. The transformation from mild dysplastic to invasive carcinoma generally occurs slowly within several years, although the rate of this process varies widely. According to Neilson and Jones, (2015) multiple local growth pattern

of invasive cancer have been described, with combination growth pattern being common.

**Dysplasia:** The process of metaplasia can be disrupted by external influences and can lead to disordered squamous epithelium called dysplastic epithelium. Human papilloma virus is now implicated in this process, also smoking and immune suppression appear to be additional factors which may act as co-agents. Dysplastic epithelium lacks the normal maturation of cells as they move from the basal layer to the superficial layer. The nuclei tend to be larger, more variable in size and shape and more actively dividing than in healthy squamous epithelium. Dysplasia are now usually referred to as cervical intraepithelial neoplasia (CIN) (American Cancer Society 2016). They are graded as mild, moderate or severe, depending on the degree of cytological atypia and also the thickness of epithelium involved derived from the 2001 Bethesda System. CIN I affects only the deepest third of the epithelium from the basal layer upwards, with maturation seen more superficial to that. CIN II affects two-thirds of the thickness of the epithelium, while CIN III shows no maturation throughout the full thickness (Schiffman, Castle, Jeronimo, Rodriguez and Wacholder, 2017).

## **METHODS OF CERVICAL CANCER SCREENING.**

**Cervical cancer screening** is the process of detecting and removing abnormal tissue or cells in the cervix before cervical cancer develops. By aiming to detect and treat cervical neoplasia early on, cervical screening aims at secondary prevention of cervical cancer. In developed countries with well-established screening programs, the incidences of cervical cancer have been reduced by 70-90%. Sporadic screening is being carried out in Nigeria using opportunist method for those who visit certain clinics. Also, there is no standard policy or

protocol for cervical cancer screening in Nigeria (Ndikomand and Ofi, 2012). Several screening methods for cervical cancer are the Pap test (also known as Pap smear or conventional cytology), liquid-based cytology, the HPV DNA testing, the visual inspection with acetic acid and colposcopy. Colposcopy is not used as a primary screening test but it is combined with other tests (Ifemelumma *et al.*, 2019). Pap test and liquid-based cytology have been effective in diminishing incidence and mortality rates of cervical cancer in developed countries but not in developing countries. Prospective screening methods that can be used in low-resource areas in the developing countries are the HPV DNA testing and the visual inspection. There are also a number of different types of screening method available (Arbyn, Anttila, Jordan, Ronco, Schenck, Segnan, Wiener, Herbert, von-Karsa, 2010).

### **Many methods currently exist to detect cervical cancer. The various methods include:**

1. Visual inspection tests:  
(a.) Speculoscopy (b.) Cervicography
2. Cytology tests: (a) Papanicolaou (Pap) test (b) human papilloma virus (HPV) DNA-based screening test.
3. Liquid-Based Cytology (LBC)
4. Colposcopy
5. Pelvic Examination
6. Cryotherapy
7. Automated Screening Technology

#### **1. Visual Inspection (VIA/VILI) Tests**

The most recommended and accessible method of screening in low resource settings is called Visual Inspection with Acetic Acid (VIA) or Visual Inspection with Lugol's Iodine (VILI). Comparatively cost-effective methods, these tests involve swabbing the cervix with vinegar (acetic acid) or Lugol's iodine which will

highlight differences in cell structure and absorption rates, turning the pre-cancerous cells white (aceto-white cells). If iodine is applied to the cervix, precancerous and cancerous lesions appear well-defined, thick and mustard or saffron-yellow. Health care providers can use this method without magnification, using a light source and their eyes to identify a need for further investigation, (WHO, 2013).

Studies have demonstrated that these are very effective methods of identifying precursors or existence of cervical cancer, with different studies indicating that VIA/LIVI are able to detect between 65 and 95% of cases requiring further examination. While not as in-depth as pap smear test and less effective on post-menopausal women due to physiological changes, the accessibility of VIA/LIVI make them a great solution for low resource settings, (Walraven, 2016). With adequate training this test can be performed by nurses and midwives in various locations, better ensuring that women are screened. In some cases, VIA/LIVI has added low power magnification to the procedure, indicating even more accurate results. Requiring comparatively minimal infrastructure, this low-tech approach provides a great opportunity for low resource countries and countries in transition to detect cervical cancer - one step towards stopping it from needlessly taking women's lives (Walraven, 2016).

**Speculoscopy:** Speculoscopy involves inspection of the cervix following the application of 5% acetic acid with chemiluminiscent light and a low power magnification.

**Cervicography:** Cervicography involves taking photographs of the cervix using a special camera following the application of 5% acetic acid during a routine pelvic examination and Pap smear collection. The photographs are then developed and the slide is projected on a 2x2 meter screen and read by an expert in colposcopy.

The use of these tests as alternatives to the more expensive and complex cytology tests have been advocated by (Chirenje, Blumenthal, Gaffikin and McGrath, 2015) cited in (Adefuye, 2016). According to them VIA had a sensitivity of 76.6% and a specificity of 64.1% compared to 44.3% and 90% for cytology respectively as observed in their study in Nigeria compared to findings specified by WHO, (2013) with specificity of 74-94% and sensitivity of 77%. They are currently may be the most ideal method for Nigeria. Most women may not be able to afford the other screening methods and this will afford women the privilege of knowing their cervical status to prompt early initiation of action to reduce morbidity and mortality.

Despite the availability of screening methods mentioned, many women in low income countries e.g Nigeria do not have access to these services (WHO 2014). In such countries, visual inspection with acetic acid (VIA) which is a low cost method that does not require specialized know how is being advocated (PMGNCCP 2014).

## 2. Cytology tests

Cervical cytology is considered to be a very specific high-grade test for pre-cancerous lesions or cancer. Women found to have low-grade lesions are asked to return for a follow-up smear every six months so that progression or regression of the abnormality can be monitored. There are two main types, (WHO, 2013).

**a. Papanicolaou (Pap) test:** This is the conventional test where a sample of cells is taken from the transformation zone of the cervix using an extended-tip wooden spatula or brush (using a cotton swab is no longer recommended). The entire transformation zone should be sampled since this is where almost all high-grade lesions develop. The sample is smeared onto a glass slide and fixed with a

preservative solution. The slide is sent to the cytology laboratory where it is examined to rule out the presence of any cancer cells. It is used for both healthy women and those who may present with cervical bleeding or other symptoms of cervical cancer. The Pap smear test is not carried out if the woman is actively menstruating, has a clinically evident acute inflammation, or is pregnant, (WHO, 2013). It is normally recommended that cervical cancer screening should begin three years after vaginal intercourse is initiated and no later than the age of 21. For most women, the test is recommended every one to three years, depending upon the woman's age and history of abnormal results. For women who have a past history of an abnormal screening test or who have risk factors for cervical cancer, testing is

recommended once per year (Ian *et al.*, 2011). The Papanicolaou (Pap) smear is the most common screening method used to detect precancerous changes for squamous cervical cancer. However, other methods, i.e liquid based cytology and HPV testing are now the most advocated tests (Krishnakumaret *al.*, 2011). The use of Pap smear has been the main stay of cervical screening and has contributed greatly in developed countries in the reduction of the incidence of cervical cancer in these countries. Incidence of cervical cancer in many developed countries has fallen by more than 75% since the introduction of Pap smear more than 40 years ago, (Basu Sarkar, Mukherjee, Goshal, Mittal, Biswas, Mandal and Sankaranayanan, 2016). The following chart shows the frequency of pap test.

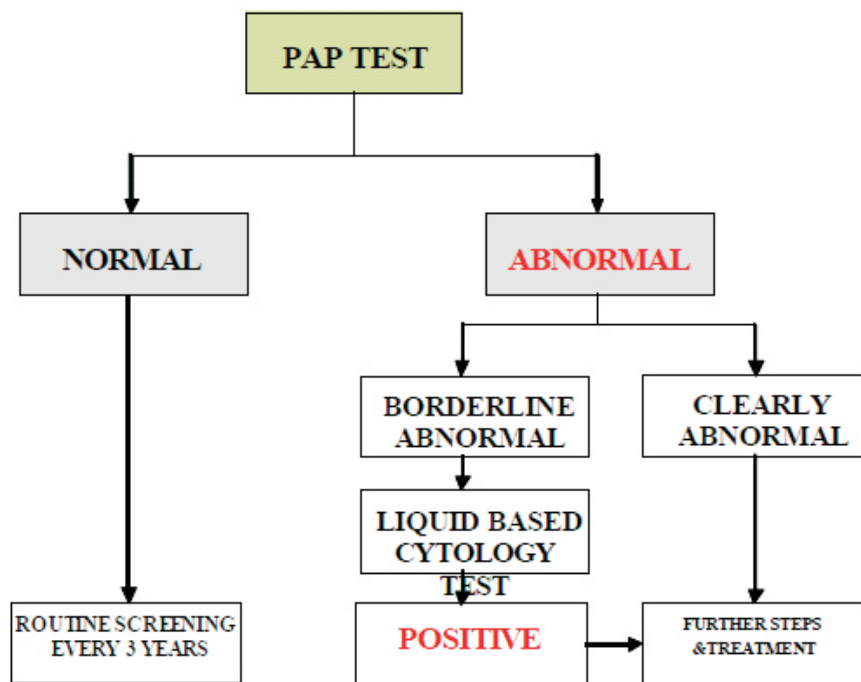


Figure 1: Frequency of PAP test

**b. Human Papilloma Virus (HPV) DNA-Based Screening Test:** This approach is used to detect high-risk HPV DNA in the vaginal or cervical smears. A sample of cells is collected from the cervix or vagina using a swab or small brush and placed in a small container with preservative solution. The specimen can be collected by a health care provider or by the woman herself. Studies comparing the two ways of collection have shown self-collection is less sensitive than the provider-collection, (WHO, 2013).

These tests require sophisticated and expensive laboratory equipment. Detection of high-risk HPV does not necessarily mean that pre-cancer or cancer is present. It simply indicates that there is an HPV infection, which is common in women under 35 years and most of this resolves spontaneously. In women aged 35 years or older, HPV DNA tests perform better because in these women a positive test is more likely to be due to a persistent infection than in younger women. HPV is not generally used as primary screening test. It is mainly used in combination with cytology to improve the sensitivity of the screening or as a triage tool to assess which women with border-line Pap smear results need to be referred for colposcopy. The main indication is Pap smear result with atypical cells of undetermined significance. They are only recommended for use in pilot projects or closely monitored settings or where sufficient resources exist.

### **The benefits of HPV tests**

Several large studies have compared HPV tests with Pap tests to see what advantages they have in cervical screening. The studies looked into whether HPV tests are better at detecting high-grade dysplasia (abnormal cells that have changed a lot) and preventing cervical cancer. A total of more than 235,000 women participated in the six studies.

HPV tests were used in very different ways in these studies. For example, sometimes they are used instead of Pap tests, and sometimes they are used in addition to Pap tests. In the studies, both of the tests were carried out every 3 to 5 years. This is different compared to the situation in Germany where Pap tests are offered once a year.

The results of these studies show that HPV tests are more effective than Pap tests at discovering high-grade dysplasia (abnormal cells that are likely to turn into cancer). Individual Pap tests fail to detect half of all cases of dysplasia. HPV tests help to detect a lot more cases. If Pap tests and HPV tests are carried out regularly over a long time period, both detect most areas of abnormal cells. But HPV tests are slightly more effective overall: Fewer women who have HPV tests developed cervical cancer. The studies lasted about five years. This is what was found during that time:

- About 4 out of 10,000 women developed if they only have Pap tests.
- And about 1 out of 10,000 women who have HPV tests (in addition to, or instead of Pap tests) developed cervical cancer.

But the studies did not allow any conclusions to be drawn about whether women who have an HPV tests are less likely to die of cervical cancer. HPV tests can also have disadvantages. Many abnormal cells do not develop into cervical cancer. This means that compared to Pap tests, HPV tests might also be more likely to detect abnormal cell changes that would have returned to normal on their own and never developed into cancer.

The fact that cervical cancer rarely presents any symptoms in its early stages highlights the importance of regular screening for the disease. Cytology every two to three years for women between the ages of 21 and 65 reduce the risk of dying from cervical cancer. Of 1,000 women who do not get screened, 10 could die from cervical cancer. Of 1,000 women who do

get screened, 2 could die from cervical cancer. Therefore, there are 8 less cervical-cancer-related deaths in the 1,000 women who get screened. This is due to the fact that cervical cancer screening helps in early detection of abnormal cells in the cervix, which can develop into cancer. A doctor can remove the parts of the cervix that contain these cells before a cancer develops. In this way, screening reduces the risk of getting cervical cancer. Since the 1970s, the incidences of cervical cancer and cancer-specific mortality have decreased considerably in Northern and Central Europe, as well as in North America. This decrease correlated with the introduction of screening for asymptomatic women. The U.S. Preventive Services Task Force has calculated that introduction of screening reduced the incidence of cervical cancer by at least 60% and cancer-specific mortality by 20-60%.

### 3. Liquid-Based Cytology (LBC)

All currently available cytology technologies rely on the visual analysis of exfoliated cells from the uterine cervix. Improvement of conventional cytological screening has been proposed by the introduction of molecular-based markers applied to liquid based cytology (LBC). It was developed to address the limitation of Pap smear and represents the first major change in preparation method for cervical screening samples. Instead of cells being smeared onto a glass slide, they are washed into a vial of liquid and filtered and a random sample is presented in a thin layer on a glass slide. DNA methylation changes occur very early in carcinogenesis and identification of appropriate DNA methylation markers in such samples should be able to distinguish high-grade squamous intraepithelial lesions (HSIL) from nonspecific cytology changes and the normal cervix (Hutchinson *et al.*, 2009).

The liquid based cytology (LBC) corresponds to a sampling where cells are put

in suspension in a conversation liquid. For the clinician, the sample is made the same manner as that of the conventional smear by using a plastic brush, which can take the squamo-columnar junction and the endocervix, or by combining the use of a spatula and an endocervical brush. The taken material is then immediately rinsed in the bottle, which contains a fixative allowing transport to the laboratory. A part of the sizable brush can be left in the bottle. The clinician does not have to deal with any spreading, which is done at the laboratory. Currently, two technical methods, which use automats, were validated by Food and Drug Administration (FDA) and are used frequently (Schiffman and Solomon, 2009).

One is proceeding by filtration and collecting cells vacuum-packed on a membrane with transferring cells on a glass (ThinPrep, Cytoc). The other is proceeding by centrifugation and sedimentation through a gradient of density (Surepath, Tripath Imaging). Cytoscreen System (SEROA), Turbitec (Labonord), CellSlide (Menarini) and Papsin (Shandon) are centrifugation and sedimentation manual techniques, which do not use automate and do not require a FDA agreement (Lee *et al.*, 2007).

**4. Colposcopy:** Colposcopy is magnified visual examination of the ectocervix, SCJ and endocervical canal using a special instrument called a colposcope. It may be accompanied by a biopsy of any abnormal-looking tissue is very similar to a Pap smear. A woman will lie on her back while a doctor inserts a speculum into her vagina. He will also apply a local anesthetic to her cervix as well as a special solution that will stain any abnormal cells white. The doctor can then view the cells using the high-powered microscope to detect any abnormal cancerous cells (Wright *et al.*, 2012).

**5. Pelvic Examination:** A pelvic examination is also an important method of detecting cervical cancer. The exam is very similar to the Pap smear. A woman lies on her back while a doctor inserts a speculum into her vagina. A doctor will then examine a woman's vagina and surrounding organs both visually and manually. He will insert gloved fingers and gently feel the cervix and surrounding organs with his fingers, while his other hand presses gently on the patient's stomach (Dzuba *et al.*, 2012).

**6. Cryotherapy:** Cryotherapy or freezing cervical tissue that is likely to develop into cancer can be used to treat precancer among women who have been screened using Pap, VIA or HPV DNA testing. The procedure does not require electricity, and is both cheaper and technically simpler than other treatment options. Cryotherapy has been proven effective and safe in multiple studies and can be done either in a single-visit approach or at a convenient referral site. A systematic literature review, including 32 studies of cryotherapy effectiveness, found an overall cure rate of 89.5% for all grades of cervical intraepithelial neoplasia (CIN) after one cryotherapy treatment at 12 months' post-treatment (Castro, 2013).

#### **7. Automated Screening Technology**

The effectiveness of any cervical cancer screening program that relies on cervical cytology is the quality control of the cytological review of Pap smears. This is essential for reducing the false positives and false negatives that invariably result from inter- and intra-observer variation (Brown and Garber, 2009). Automated screening techniques have recently been developed that can not only perform this quality control rescreening but also can be used

for primary screening of cervical smears. The Autopap300 (TriPath Imaging, Burlington NC) and PAPNET (Neuromedical systems) are the two automated screening techniques that rely largely on neural network technology and are based on the computerized imaging and identification of abnormal cervical cells. Among this only the Autopap300 is approved by the USFDA for primary and secondary cervical screening while the PAPNET is only approved for secondary screening (Clyde and Schechter, 2006).

#### **FACTORS AFFECTING THE EFFECTIVE UTILIZATION OF CERVICAL CANCER SCREENING**

The factors affecting the effective utilization of cervical cancer screening in Nigeria includes: lack of awareness, lack of knowledge, negative attitude, economic factors, lack of referral, and perception about non-susceptibility to cancer, poor institutional resources and ignorance

**Lack of awareness:** Studies conducted in African countries like Uganda, Botswana and Nigeria and also in Thailand and India showed that women have limited knowledge and a negative attitude towards cervical cancer and pap smear screening which contributed to their non-participation in screening programmes and for some, even though they were screened, they do not represent themselves for follow-up for further management once abnormality is detected in their smear results (Basu, Sarkar, Mukherjee, Goshal, Mittal, Biswas, Mandal, Sankaranarayan, 2013; Gharoro and Ikeanyi 2016).

**Lack of knowledge:** The major findings in a study in Nigeria about female health workers showed that their pap smear utilization was very low and there was a wide gap between their knowledge and uptake of pap test (Gharoro and Ikeanyi 2016). Cervical cancer is preventable through early diagnosis and prompt treatment, yet millions of women die

from it annually. The study by Kene, Saleh, and Nandul, (2013) showed that lack of knowledge about cervical cancer, cervical cancer screening and its benefits and accessibility to screening and vaccination services were the major reasons given for poor utilization of screening services.

**Negative attitude:** The health beliefs of individuals are strong determinants in their choice of action or non-action to reduce the incidence and death from cervical cancer. In the middle and low resource communities, people tend to seek care only when problems arise; in the case of cervical cancer this usually proves devastating for the woman as at this point the cancer has frequently reached an advanced stage. If not already too late, treatment will require invasive surgery or radiation therapy which even without taking into account the significant impacts on the woman and her family may not be available in these countries. If the cancer is treatable it will result in a painful agonizing death (Walraven, 2016).

**Economic factors:** Families, communities and countries all suffer when the woman dies. Women are usually the primary care givers in low resource countries managing their homes and doing their best to provide for their children. The death of a woman has many impacts from the macro to the micro situations. Those who suffer the most being the most vulnerable are the youngest children. For women struggling to make ends meet, spending money on preventable check-ups is hardly a priority. The screening tests and how to get one is mainly unheard of, not to mention un-affordability.

**Lack of referral:** Non-utilization has also been attributed to non-physician referral even by those who have seen a gynaecologist for other health reasons in the last five years (2013-2015) (Egwuonwu, 2016).

**Perception about non-susceptibility to cancer:** Perceptions about non-susceptibility

to cancer of the cervix and lack of awareness of screening venue are also given as reasons for non-utilization of Pap smear services.

**Poor institutional resources:** According to World Health Organization (2013), screening is the front line in the battle against cervical cancer but the resources involved are enormous.

**Ignorance:** It has been reported that individual *ignorance traditional beliefs* and other socio-cultural *factors* influence the participation of some women in the utilization of cervical cancer screening services. Some men may not permit their wives to be screened by male nurses in the northern part of the country as a result of sociocultural influences.

**Community-related factors:** Sexuality is identified as a taboo topic for parents who want to protect family reputation and encourage modesty, particularly among daughters. This results in young women not having the necessary sexual health education (Markovic *et al.*, 2005). In a study conducted by Markovic (2005) in central Serbia that explores women's cervical cancer-screening behaviors, participants viewed a lack of informal sexual education to be a barrier to cervical cancer screening. Participants also mention that there is stigma attached to discussing reproductive health issues in their communities, which contributes to the women having little knowledge about cervical cancer and its prevention. Among black and minority ethnic communities in the study conducted by Thomas *et al.*, (2015), it is also revealed that African communities do not talk about some cancers, especially cancer of the cervix as it is regarded to be a taboo. Gender role, the overall subordinate position in the family and the society, are the suspected factors influencing women's poor ability to access cervical cancer screening (Markovic *et al.*, 2005). In a study conducted in Mexico which aims at attempting to analyze the role of several social and cultural

factors in relation to the early detection of cervical cancer, it was reported that women feared abandonment by their partners when faced with confirmation of diagnosis of cervical cancer. The study mainly focuses on the influence of partner and the social networks regarding utilization of the Pap test. Such fear would make women not to go for cervical cancer screening. (Pelcastre -Villafuerte *et al.*, 2007).

#### **THE ESSENTIAL ELEMENTS FOR SUCCESSFUL CERVICAL SCREENING.**

They include the following:-

##### **Initiation of cervical screening in the context of a National Cancer Control Programme:**

Cervical screening should be planned within the context of national planning, and a decision made after a determination of the relative priority of cervical cancer in the country (WHO, 2012). In many developing countries cervical screening exists in some form or other, often associated with maternal or child health services, and/or as a component of private health care for affluent women. As already indicated, such programmes tend to be ineffective, as adequate coverage does not extend to the majority of women with the high risk of the disease. Moreover, they are decentralized and only partially funded. Experience in the United Kingdom confirms that a radical reorganization of the programme is required, with appropriate incentives to ensure that relevant health care providers participate (Patnick, 2010). In some developing countries with liberal health care systems, screening is often performed on an opportunistic basis, with under-screening of the high-risk group women and heterogeneous quality of screening. It is often impossible to document effectiveness of screening because of lack of adequate monitoring (Van Ballegooijen, 2010).

##### **Political will to proceed, with support and funding from the Ministry of Health:**

Although programmes can initially be based on support from external donors, they will never become self-sustaining without a political decision to support the programme and maintain it with governmental funding after the external support ends. Further, without political support, it may be extremely difficult to cope with various internal, or sometimes external, pressures to change decisions taken with regard to the programme.

**An adequate health care infrastructure:** It is important to ensure that the introduction of screening does not adversely affect other important health services. Therefore, implementation of cervical screening should be planned so that it is consistent with the developing health care infrastructure of the country. Developing a cervical screening programme can facilitate the improved functioning of a health care system. It should, therefore, be undertaken in a manner that is integrated with existing services so as to improve health system functioning. The most profound need is support for the management functions to enable screening to be undertaken.

**Definition of the target population:** The epidemiology of the disease in the country will guide the decision-making process (Miller, 2002). It is important that decisions on age are taken on the basis of age-related incidence rates of invasive cervical cancer and not on the percentage distribution by age of clinically detected cases of cancer in the country.

**Education of the target population:** It has been well documented that professional and public education, combined with the availability of treatment for early stages of invasive cancer of the cervix, has significant effect in reducing the morbidity and mortality from the disease, long before screening programmes are introduced (Ponten, 2005). Education is thus a basic measure that will

contribute to early diagnosis of the disease, and upon which screening must be based. It is important that the educational programmes be designed for the culture of the country, and that they observe the myths that tend to be prevalent about cancer.

**Identification of the target population:** The ideal means is a population register, but this will often be unavailable, or inaccessible to the screening programme, even if present. Other means are often found to exist and be accessible, however, providing data protection legislation permits such access. These include a locally performed census, voting registers, and existing medical records.

**A means to invite the target population for screening:** These can include letters of invitation in literate communities, mass media invitations to attend, special efforts for recruitment with health care workers or volunteers working in the community, or utilizing contacts women make with the healthcare system for other purposes. It will be necessary to ensure that the woman's personal health concerns are taken care of to ensure her collaboration with screening.

**Training of relevant health care professionals:** There are many types of health care professionals that will require training. For administration of the screening test these tend to be specific to the test that will be used. However, for all tests, adequately trained professionals will be required for the diagnosis and treatment of the detected abnormalities. Initiating programmes by screening current health staff as the first step may increase empathy in service providers. From a managerial point of view, a method of ongoing monitoring that tracks issues such as privacy, respectful interactions, informed consent, etc. would be important in reinforcing their centrality to service provision and to sustaining respectful caring service provision. Methods of engaging service users in monitoring the

quality of care are an option that has proved useful in other programmes and should also be investigated (Salas, 2012).

**A defined referral system for women with an abnormality and a mechanism to ensure women with an abnormality attend for diagnosis and treatment:**

It is essential to ensure that women with a defined abnormality receive appropriate diagnostic tests, and if confirmed to have a lesion that requires treatment, receive the relevant therapy. There should be no financial barrier to such referral and attendance. Health care practitioners working at the primary level should understand the process. Several studies have identified poor communication and feedback systems between clinic and laboratory staff and between screening centres and treatment facilities. Secondary and tertiary levels of care do not see themselves as part of a system. They see little value in reporting patient outcome and primary care sites may have difficulty making appointments for patient follow-up. This is a barrier that patients are often left to negotiate on their own. Frequently, patients refer to secondary level care sites who have abnormal results are subjected to a repeat Pap smear and are asked to return again once that result is available.

**Management guidelines:** It is important that protocols are developed for primary care staff on how to interpret and act on screening test results. Their absence can lead to inadequate action and the risk those patients who require either repeat tests or investigation and definitive treatment will be overlooked. Cryotherapy, loop electrosurgical excision procedure (LEEP), laser ablation and cold knife conization of the cervix are different standard therapeutic options for the treatment of precancerous lesions and most of these can be provided as outpatient procedures. It has now been established that all of the standard outpatient treatments for dysplasia under

colposcopic guidance are highly effective and are associated with low rates of complications.

**Follow-up of screened women:** Systems to routinely follow-up **screened women** must be in place. Such systems maybe absent because of the poor introduction of the screening programmes, in part because funding for health services is decreasing and patient follow-up for any disease is not seen as a priority. Supervisors must be encouraged to see this as part of a system to improve quality of care.

**Identification of failed programme:** If the programme is set within an area with an existing population-based cancer registry, invasive cancers will be identified by linking the screening file with the cancer registry. If a registry does not exist, a means should be found to set up a registry of all cases of invasive cervical cancer. It is important to recognize that even when a screening programme is well organized, there will continue to be adequately screened women with true negative slides on review who develop cervical cancer. One reason could be that the lesion did not exfoliate another that the particular malignancy progressed too rapidly for detection by screening.

**Defined evaluation plan:** Strategies for evaluation have been proposed (Coleman, 2003). Eventually, the success of the programme will be determined by reduction in the incidence of invasive cancer. If excellent coverage with screening is achieved, incidence will fall within 10 years of starting the programme. Several intermediate endpoints can be proposed to monitor the programme.

### **CERVICAL CANCER SCREENING AS A TOOL FOR PREVENTING CANCER**

Cancer is a disease condition that has good prognosis when detected early especially where the cells are localized. Cervical cancer screening prevents cancer in the following ways:

- a. **Detection of precancerous changes:** Cervical cancer screening for females is expected to commence from 21 years and should be done every three years between 21-29 years, every five years from 30-65 years (Cooper and Jones, 2013). Those at risk should do the test more often because it is a way of detecting precancerous changes which can be treated before they become invasive. Through Papanicolaou and Human Papilloma virus (HPV) tests, precancerous cervical changes are detected. Visual inspection of the cervix with acetic acid is affordable and assessable in most tertiary health institutions. Also, pap smear which is the collection of cervical cells to check for abnormality through a microscope helps in early detection of females that are at risk of cervical cancer.
- b. **Detection of cervical or vaginal infection:** HPV test discloses the presence of HPV infection which may lead to precancerous changes. Routine screening cannot be overemphasized because no vaccine provides complete protection against cervical cancer (Adam, Kaufman, Adler-Storthz et al, 2016).
- c. **Early detection of cancer cells:** When there is routine cervical cancer screening, cancer cells will be detected early and removed. By such intervention there is a high chance of preventing invasive cancer.
- d. **Regular Pap test:** When the guideline for cervical cancer screening for is followed, it will ensure that no cancer cells will be detected at the early stage. The right time for Pap test is between 10-20 days after the start of the last menstrual period and there should be no douching and application of drugs vaginally 2 days before the test. Futhermore, there should be no sexual intercourse for 1-2 days before the test to avoid fluids that may prevent or alter the result of the test.

## **NURSES ROLE TOWARDS CERVICAL CANCER SCREENING**

**Advocacy for a boost of cervical cancer screening:** Nurses in comprehensive health centres should meet people in authority (local government council) to discuss the need to facilitate cervical cancer screening for the high-risk group in such communities.

**Reaching high risk group through health talk:** They can be reached in tertiary institutions, during mothers August meeting, Open-air campaign and in clinics e.g- antenatal care, gynecology and medical clinics.

**Making appointments for women in the high risk group:** Being proactive in contacting and making appointments for women in the high risk group is likely to increase screening of women at higher risk of poor cervical cancer outcomes. The general practice should be to implement a systematic approach to find and contact women who have not received a smear within the last three years. The following method may be used:

- Search patient records to identify the women aged 20 – 69 years in the practice population who have never had a smear or who have not had one within the last three years.
- If the woman is not up to date, place an alert on her medical record so that a smear can be offered the next time they attend the general practice
- All women who are overdue for a smear should be contacted by text message, letter or telephone and encouraged to make an appointment for a smear
- If the woman cannot be contacted, verify if a smear has been performed by another provider, such as family planning unit.
- Those women who decline to have a smear as a general practice should be offered referral to another provider based on their reason for declining, e.g. to a regional

provider if they feel uncomfortable being screened by someone they know. Women who wish to withdraw from the national register should have their details removed from the register. In addition, they should be regularly asked whether they wish to begin screening again, and any barriers to testing discussed.

## **CONCLUSION:**

Cervical cancer should be a public health priority in Nigeria. It affects many women and no region of the country is excluded. It affects women in their prime when they are very vital to their families, communities and the nation. Cervical Cancer is cheaper to prevent than cure and there are cost-effective prevention strategies that can be adapted to the Nigerian situation. Controlling cervical cancer will contribute to achieving some Millennium Development Goals in Nigeria. There is the need to draw a national policy to guide cervical cancer screening and management in Nigeria. Appropriate and feasible technologies like visual inspection with acetic acid are available and should be used in the proposed national program pending when resources improve. Control of cancer in Nigeria is not only a public health issue but it is a human right and ethical issue.

## **RECOMMENDATIONS**

- More studies are needed on the capacity of the health system to organize a national cervical cancer control program.
- The government should show greater commitment for cervical cancer control by expediting policy making process and increasing funding for cervical cancer control.
- There should be sensitization on need for policy for National cervical cancer screening program.

- Level of awareness about cervical cancer and its prevention should be increased using community based peer educators and Community Health Workers (CHWs). These should mobilize targeted women for screening.

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