

# Cervical Cytology: A Review of 597 Cases in a Tertiary Health Centre in Nigeria

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## Abstract

**Background:** Cervical cancer is the most common gynaecological cancer among women in the developing countries. It is preventable by early detection and treatment of the precursor lesions. Cervical cytology became the standard screening test for cervical cancer and premalignant lesions with the introduction of the Papanicolaou (Pap) smear. **Aim:** to determine the uptake, indications and results of cervical cytology in a tertiary health center in Nigeria. **Materials and Methods:** a 5-year descriptive study of the results of cervical cytology among women who attended the gynaecological outpatient clinic of the Hospital. **Results:** a total of 597 cases of cervical Pap smears were received at the histopathology department during the study period out of which 20 (3.4%) were inadequate for cytological evaluation. The patients age ranged from 15 to 80 (mean 38.8 SD = 11.4) years. The average annual uptake of the Cervical smear was 9.3% of the total number of patients seen in the gynaecological clinic during the study period and the main indications were routine medical check-up, 256 (42.9%) and cervicitis 76 (12.7%). About 398 (66.7%) were normal smears while 152 (26.3%) were abnormal. Non-specific inflammatory changes were present in 113 (74.3%) cases. Cytology was positive for intraepithelial lesions in 6.8% (39/577) cases. Eighteen percent (7/39) of them were high-grade lesions while squamous cell carcinoma was detected in 12.8% (5/39) cases. **Conclusion:** the uptake of cervical cytology of 8.7% is low and the main indication was routine check up. Premalignant lesions were detected in 6.8% of cases.

## Keywords

Cervical Cytology, Cervical Cancer, Nigeria

## 1. Introduction

Cervical cancer is the main cancer among women in sub-Saharan Africa, India,

and other parts of the developing world [1]. India accounts for a quarter of world's burden of the disease [1]. The country accounted for 23.2% (123,000) of new global cervical cancer cases and 25.1% (67,000) of cervical cancer related deaths [2]. Cervical cancer is a leading cause of cancer related death in women in most developing countries of the world and has over 500,000 new cases and more than 300,000 deaths globally each year [3]. It is the second leading cause of cancer-related deaths among women in Jamaica [4]. In Nigeria, cervical cancer accounted for 67.8% and 77% of genital tract malignancies in Sokoto and Zaria respectively [5] [6]. Most of the patients present with advanced stages of the disease when treatment for cure is not feasible. This ugly scenario is due to ignorance, poor health seeking behaviour, presence of risk factors such as sexual promiscuity, polygamy, early sexual debut and large number of pregnancies [3] [5]. Similarly, there is no organized screening practice to detect the early forms of the disease. According to the World Health Organization (WHO), the highest burden of cervical cancer occurs in developing nations where there is a lack of effective screening programs and low uptake of Pap smear or pelvic examination [7].

Cervical cancer is preceded by a pre-invasive lesion, which can be detected by exfoliative cytology like a Papanicolau (Pap) smear examination [7]. Therefore, it is considered preventable, as the premalignant stages can be detected cytologically and effective treatment can be offered. The disease is of public health importance, it is common and serious. The natural history of the disease has been known for a long time and it therefore meets the criteria for screening for prevention. Cervical cancer is caused by persistent infection with the oncogenic strains of human papilloma virus (HPV) particularly HPV 16 and 18 [5] [8]. The risk of developing squamous cell carcinoma of the cervix is about 400 times higher following infection with HPV16 and about 250 times higher following infection with HPV18 compared to the risk in uninfected women [9]. The infection is sexually transmitted and is therefore related to lifestyle. Up to 80% of women acquire the infection in their lifetime [10]. Most of the infection by the virus is cleared by the body defence mechanism, but in about 5% - 10% of cases it becomes internalized. It is this persistent infection that results in cervical dysplasia and ultimately cervical cancer. Screening with the conventional Pap smear has been seen to be accompanied by a dramatic reduction in the incidence of cervical cancer in different countries of the world [11]. Cervical cytology became the standard screening test for cervical cancer and premalignant lesions with the introduction of the Papanicolau (Pap smear) in 1941 [12]. The goal of cytological screening is to sample the transformation zone, the area where the physiological transformation from columnar endocervical epithelium to squamous (ectocervical) epithelium takes place and where dysplasia and cancer arise. Well-organized cervical cancer screening programmes have reduced the mortality from cervical cancer by up to 50% in the developed world [8]. However; in most low-resource countries of the world screening facilities are either absent or rudimentary. Most screening programs are opportunistic, isolated and not pop-

ulation based. Similarly, the uptake for the Pap test is low even when it is available [13]. Despite these limitations; the conventional Pap smear is still the most widely available screening method for cervical cancer especially in low resource settings. The liquid-based cytology (LBC) aims to minimize errors of omission and commission inherent in the conventional Pap smear. It is now the standard test used by the National Health System (NHS) of the United Kingdom for cervical screening program [11]. However it is yet to take root in many low resource settings. Recently, HPV DNA testing has been recommended by the WHO as a standard screening method for cervical cancer. This is based on the fact that HPV DNA is found in over 95% of cervical cancers and precursor lesions worldwide [8]. This non-cytological method of screening is not readily available in most centres in Nigeria. Despite the high prevalence of cervical cancer in Nigeria, there is no organized national HPV vaccine immunization programme to provide for primary prevention of the disease. We present the result of a 5-year screening programme for cervical cancer by the conventional Pap smear in tertiary health institution in Nigeria.

## 2. Aims and Objectives

The study aimed to determine the indications, uptake and the results of cervical cytology in a tertiary health institution in Nigeria

## 3. Subjects and Methods

This is a review of all cases of cervical smears that were assessed at the Histopathology department of the hospital over a 5-year period (1st of January 2011 to 31st of December 2015). The smears were from women attending the gynaecological outpatient department and in whom pap was advised by the treating gynaecologist for clinical indications. The hospital is a tertiary health institution located in the region of Nigeria. It has 886 bed spaces and provides tertiary and secondary health care services to neighbouring states. It also runs residency training program for doctors in the various sub-specialists including Surgery, Obstetrics & Gynaecology, Internal Medicine, Paediatrics, Histopathology among others.

The hospital cases are those referred from health institutions in the metropolis and also from neighbouring states. It also receives referrals from Niger Republic, a country located in the northern frontiers of Nigeria. The study was commenced on the 27<sup>th</sup> of July 2016 and was completed on the 23<sup>rd</sup> of October 2016; a period of three months. The Hospital's Research and Ethical Committee (HREC) approved the study (HREC/2016/No.532). The case notes of patients who had Pap smear during the period of study were retrieved from the medical records department. The records were traced to the Histopathology department where the cytology results were extracted and analyzed. Data obtained included the socio-demographics of the patients such as age, parity, place of residence, occupation, indications for cytology, previous cytology, specimen adequacy and results of cytology were recorded in a proforma. Statistical analysis of the col-

lected data was performed using the SPSS IBM version 20 (IBM version 20.0. Armouk, NY: IBM Corp.). The results were expressed in frequencies, means, percentages, tables, figures and charts. The Bethesda system TBS (2004) with standardized terminologies for reporting cervical cytology was adopted in this study.

## 4. Results

A total of 597 cases of cervical smears were received in the histopathology laboratory during the period of study. About 3.4% (20/597) were inadequate or unsatisfactory for cytological evaluation according to the Bethesda criteria and were thus discarded. The rest 577 smears were analyzed and thus constituted the study population. The age of the patients ranged from 15 to 80 years with a mean of 38.82 [SD = 11.42] years. The annual uptake of the Pap smear shows an increasing trend as shown in **Table 1**. The modal year was in 2013. The average annual uptake of the conventional Pap smear was 9.28% as shown in **Table 1**. Cytology was performed mostly for routine indications in 42.9% (256/597), cervicitis 12.7% (76/597), abnormal uterine bleeding (AUB) in 12.1% (72/597), suspected cervical cancer 7.7% (46/597) while the least indications were post menopausal bleeding (PMB) 3.2% and utero-vaginal prolapse 2.8% (17/597) respectively as shown in **Table 2**. Thus in about 57.1% (341/597) of cases, the

**Table 1.** Annual uptake of cervical cytology in relation to overall patient load.

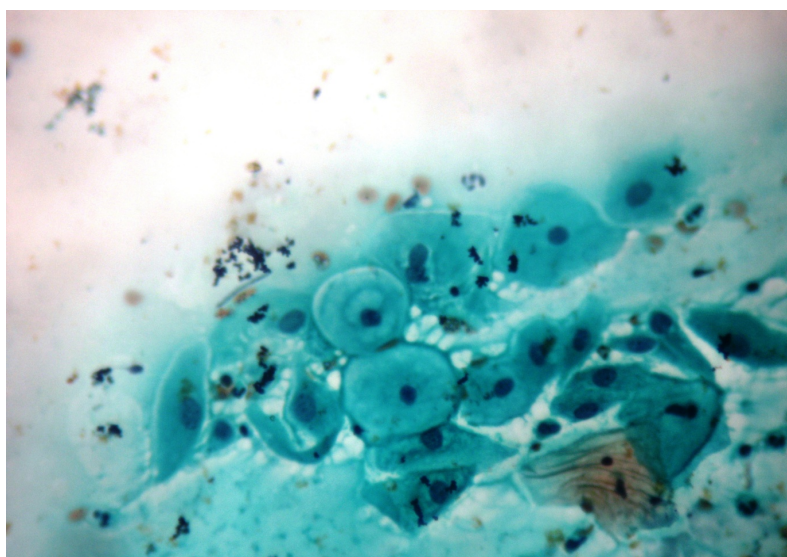
Year	Total no. patients registered in Gynaecological clinic	Number of cervical smears	Annual %
2011	1771	18	1.0
2012	1439	124	8.6
2013	1364	190	13.9
2014	1140	115	10.1
2015	1172	150	12.8
<b>Total</b>	<b>6886</b>	<b>597</b>	<b>9.3</b>

**Table 2.** Indications for cervical smear.

Indications for Pap smear	Frequency	Percentage
Routine	256	42.9
Cervicitis	76	12.7
AUB	72	12.1
PCB	47	7.9
Suspected cervical cancer	46	7.7
Inflammatory	33	5.5
Uterine polyps	31	5.2
PMB	19	3.2
UV prolapse	17	2.8
<b>Total</b>	<b>597</b>	<b>100.0</b>

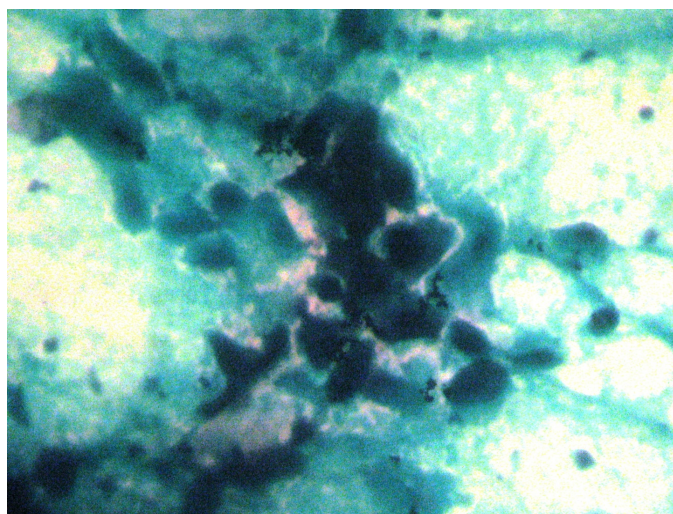
indication for cytology was due to gynaecological problems.

About 66.7% (398) of the smears revealed normal findings (NILM) while 26.3% (152/577) were abnormal cytology (including epithelial anomalies, reactive cellular changes of inflammation and infections). Out of the 152 abnormal cases, 113 (74.3%) were reported to have non-specific inflammatory changes, 16 (10.5%) showed low grade squamous intraepithelial lesions (LSIL) as in **Figure 1**, 7 (4.6%) HSIL (moderate or severe dysplasia) as in **Figure 2**, while 5 (3.3%) revealed squamous cell carcinoma (SCC). There were 11 cases of atypical squamous cells out of which 8 (5.3%) were ASC-US and 3 (2%) were ASC-H as shown in **Table 3**. The LSIL showed cells with koilocytic changes suggestive of HPV infection and mild dysplasia. Thus cervical intraepithelial cell lesions were observed in 39/577 (6.8%) of the Pap smears.



**Figure 1.** Photomicrograph of low-grade squamous intraepithelial lesion (LSIL).

HSIL2



**Figure 2.** Photomicrograph of high-grade squamous intraepithelial lesion (HSIL).

**Table 3.** Cytological diagnosis of pap smears.

Cytological diagnosis	Frequency	Percentage
NILM	398	66.7
Inflammatory	113	18.9
Atrophic	27	4.5
Inadequate	20	3.4
LSIL	16	2.7
ASC-US	8	1.3
HSIL	7	1.2
SCC	5	0.8
ASC-H	3	0.5
Total	597	100.0

NILM = negative for intraepithelial lesion or malignancy, SCC = squamous cell carcinoma, HSIL = high-grade squamous intra-epithelial lesion, LSIL = low-grade squamous intraepithelial lesion, ASC-US = atypical squamous cell of undetermined significance, ASC-H = atypical squamous cell where high grade lesions could not be excluded.

The maximum number of patients screened in this study *i.e.* 62.1% (371/597) belonged to the age group of 26 - 45 years followed by 139 (23.4%) patients within the 46 - 65 age range and was least with those in the 7th and 8th decades of life. Many of the cervical smears 28.8% (172/597) were performed for routine indications in women within the active reproductive age group of 16 - 45 years. This age group is characterized by intense sexual activity, high prevalence of sexually transmitted infections (STIs) including HPV infection, abnormal uterine bleeding (AUB), non-specific inflammation processes and cervicitis as shown in **Table 4**.

**Table 5** showed indications for cytology in relation to cytological diagnosis. Abnormal epithelial changes were observed in 11 (4.6%) cases of routine cervical smears and 2 out of the 5 cases of invasive carcinoma observed in this study were seen among those who came for routine screening. **Table 6** showed that 3 out of the 5 cases of SCC observed in this study were present within the 46 - 55 year age group. Cervical cancer is common within the age range of 40 - 59 years with a mean of 55.5 years. Similarly, most of the high grade cytological lesions (6 out of 7) were prevalent within the same age bracket but were absent in patients below the age of 25 years.

## 5. Discussion

The aim of screening for cervical cancer is mainly to detect and treat pre-malignant or pre-invasive lesions before they progress to malignant lesions. In this study, the prevalence of squamous intraepithelial lesion was 6.8%. This is low compared to the 19.8% observed from previous studies from Sokoto, 12.2% in Enugu and 9.7% from Ibadan [13] [14] [15]. Studies carried out on epithelial cell abnormalities in cervical cytology have shown 4.3% in Kuwait, 7.9% in Saudi



**Table 4.** Indications for pap smear in relation to age.

Age	Indications								
	Routine	AUB	Vaginal discharge	Suspected cervical cancer	Uterine polyps	Cervicitis	PMB	PCB	UV prolapse
≤15	3	2	0	0	0	3	0	1	0
16 - 25	24	5	5	4	0	7	0	8	0
26 - 35	74	21	9	13	6	31	2	16	3
36 - 45	91	26	15	15	17	20	1	14	7
46 - 55	44	15	3	13	7	13	7	8	4
56 - 65	18	1	1	1	1	1	6	0	3
66 - 75	1	1	0	0	0	1	3	0	0
76+	0	1	0	0	0	0	0	0	0

**Table 5.** Cytological diagnosis in relation to indication.

Indication	Cytological diagnosis							
	Normal	Inflammatory	LSIL	HSIL	SCC	ASCH	ASCUS	Atrophic
Routine	194	33	5	2	2	1	1	9
AUB	56	6	3	2	1	0	0	3
Vaginal discharge	17	13	1	0	0	0	1	1
Suspected cervical cancer	26	12	2	1	2	1	0	2
Uterine polyps	24	3	0	0	0	0	0	1
Cervicitis	33	31	2	1	0	0	3	3
PMB	7	0	2	1	0	1	0	7
PCB	30	12	1	0	0	0	2	1
UV Prolapse	11	3	0	0	0	0	1	0

**Table 6.** Cytological diagnosis in relation to age.

Age	Cytological diagnosis							
	Normal	Inflammatory	LSIL	HSIL	SCC	ASCH	ASCUS	Atrophy
≤15	6	3	0	0	0	0	0	0
16 - 25	42	7	2	0	0	0	0	0
26 - 35	125	32	4	1	0	0	4	2
36 - 45	141	43	4	4	1	2	3	2
46 - 55	65	21	5	2	3	1	1	13
56 - 65	14	7	0	0	1	0	0	8
66 - 75	4	0	1	0	0	0	0	1
76+	0	0	0	0	0	0	0	1

Arabia, and 6.8% in New Delhi India respectively [16] [17] [18]. The worldwide range of positive cytology from the conventional Pap smear is 10% [19]. The relatively low rate of positive cytology observed in this study could be attributed to the large number of clients 256/597 (42.9%) that had cytology performed for routine indications and not based on gynaecological symptoms. In the previous study from this centre, most of the indications for cytology were symptom-based (79.4%), while in Ibadan it was 53.8% [13] [15]. We also observed from the previous study from this institution that the Pap smear was taken for routine indications in only about 21.5% of cases, while in this review cytology for routine medical check-up was performed in 42.9% of patients [13]. Thus, even though the awareness has appreciated, screening for cervical cancer is still opportunistic and not the organized population based.

The annual uptake of the Pap smear showed a rising trend from 1.3% in the previous study to 9.3% in this review [13]. This recent increase in the uptake of the conventional Pap smear in our institution could be attributed to the awareness campaign, health education and workshops which were carried out within the hospital complex, places of worship and through the print and electronic media during the periods of 2012 to 2013. Thus, from this study, awareness of the value of cervical cancer screening may have translated to utilization and increase uptake of the Pap smear. This underscores the need for a well-organized population-based national screening programme for cervical cancer.

Chronic cervicitis is a very common condition in adult females and preferentially affects the squamo-columnar junction and the endocervix [18]. It is often accompanied by metaplasia in the epithelium. In this study, we observed that cervicitis was an indication for cervical cytology in 12.7% (76/597) of cases and inflammatory lesions were detected in 20% (113/577) of cervical cytology. Thus cervical smear examination is a valuable tool in the diagnosis of cervical infections which are very common in women of reproductive age group [18].

Atypical squamous cells of undetermined significance (ASC-US) were observed in 8 (1.4%) of cases in this study. Previous studies have reported the association of ASCUS in a significant proportion of women with *Trichomonas vaginalis* infection [16] [17]. However this study did not identify any causative organism. A previous review from this centre identified *Trichomonas vaginalis* in 4% of the smears [13].

Overall, epithelial cell abnormality of 6.8% was observed in this study, LSIL was present in 2.8%, ASCUS 1.4%, HSIL 1.2%, squamous cell carcinoma 0.9% and ASC-H in 0.5% of cases respectively. In a study of 6173 Pap smears taken for routine screening in Alexandria Egypt, abnormal smears were found in 101 (1.63%) out of which 0.98% was diagnosed as ASCUS, ASC-H 0.11%, LSIL 0.10%, while HSIL was present in 0.016% of cases [20]. The low incidence of cervical intraepithelial lesions and cervical cancer in Egypt was attributed to sexual behaviour, male circumcision, and religious culture [20]. It thus lends credence to the fact that cervical cancer is more prevalent in Africa south of the



Sahara desert. However, it was also noted that most of the patients with gynaecological symptoms were excluded from participating in the Egyptian study [20].

The major controversy in cervical cancer screening involves the age at which to begin screening (with the Papanicolaou smear). In this review, we observed that epithelial cell anomalies were rare in patients below the age of 25 years but became more prevalent thereafter. This is comparable with studies from Egypt [20]. It is thus reasonable to begin screening after the age of 25 years. However, cervical cancer has been detected in women as young as 21 years of age [5]. According to the American Society for Colposcopy and Cervical Pathology (ASCCP), cervical cancer screening should begin at age 21 years [21]. They stated that women under the age of 21 should not be screened regardless of the age of sexual debut or other risk factors. This is because cervical cancer is rare in adolescents and young women and may not be prevented by cytology screening [21]. Cytological abnormalities are common in this age group and can lead to labelling, anxiety, extended surveillance, and invasive procedures such as colposcopy [21].

## 6. Conclusion

In conclusion, this study has observed that the annual uptake of the conventional Pap smear in our institution showed a rising trend, but most of the indications remain symptom based. The presence of epithelial cell abnormalities on cervical cytology is consistent with literature. Awareness of the value of cervical cancer screening could result in increased utilization and uptake of the Pap smear.

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