# Cytomorphological and Prevalence of abnormal Cervical Smears in Sokoto State Metropolis


## Abstract

**Introduction:** Cervical cancer is an important global health problem and, it is the fourth leading cause of cancer death among women worldwide. The distribution of cervical cancer differs across the world, with more than 85% of deaths occurring in developing regions. The incidence of cervical cancer in developing countries is approximately four to six times that of developed countries. Over 90% of the highest incidence rates of cervical cancer occur in sub-Saharan Africa. This high incidence is also related to the limited screening techniques and strategies used.
**Aim:** The aim of this research was to investigate how the diagnostic accuracy of cervical smear screening among women in Sokoto metropolis could be improved by utilizing a combination of cytological and molecular techniques.
**Methodology:** The study was a descriptive cross-sectional one was utilized and a convenience sampling technique was employed to enlist female participants aged between 15 and 98 years old. , The total sample size was determined to be162 samples. The state was home to a variety of ethnic groups, including Hausa/Fulani, Gobirawa, Zabarmawa, Kabawa, Arawa, Nupe, Yoruba, IBO's, and others
**Results:** The standard liquid-based Pap method of preparation was used to process 162 cervical smear samples. Of these, 128 (79.0%) were found to be normal, 24 (14.8%) were abnormal, 7 (4.3%) were inadequate, and 3 (1.9%) were classified as acellular cervical smears.

**Conclusion:** The prevalence of abnormal cervical smears was found to be 14.8%. The study revealed that the level of awareness of cervical cancer in Sokoto metropolis was 77.8%. Finally, the formulation showed potential as an alternative to the standard liquid-based pap preparation.



**Keywords:** Prevalence, Awareness, Abnormal Cervical Smears and Sokoto State Metropolis


## 1.0 INTRODUCTION

Cervical cancer is an important global health problem [1] and, it is the fourth leading cause of cancer death among women worldwide [2, 3]. The distribution of cervical cancer differs across the world, with more than 85% of deaths occurring in developing regions [4]. The incidence of cervical cancer in developing countries is approximately four to six times that of developed countries [5]. Over 90% of the highest incidence rates of cervical cancer occur in sub-Saharan Africa [5]. This high incidence is also related to the limited screening techniques and strategies used [6]. Over the past decade, wide implementation of cervical cancer screening in the developed countries has contributed to a remarkable reduction in the mortality rate [7]. HPV infection is a risk factor for malignancy of the uterine cervix as it has a pivotal role in carcinogenesis via the activation of its genomic products [8]. The role of persistent infections with certain oncogenictypes human papillomaviruses (HPV) in the pathogenesis of cervical cancer has led to the development of diagnostic applications for HPV testing as an adjunct to cytology. Presently, commonly used screening methods for cervical cancer screening includes cervical cytology tests, human papillomavirus (HPV) detection and immunocytochemical expression of biomarkers. The sensitivity of these methods is considerably low resulting in misdiagnosis [9]. Due to ambiguity of the regular cytological screening method (pap smear) and

visual inspection (VIA) [10], it becomes necessary to combine methods in order to enhance screening accuracy thereby reducing the number of false screen-positives and also reduce false cytology negatives. The potential of an oncogenic human papillomavirus (HPV) to enhance the genetic instability cells thereby rendering such cells susceptible to malignant transformation and eventual progression to cervical cancer is a major cause for concern. Due to the low sensitivity of the conventional pap staining technique as a result of the presence of obscuring materials in pap cytology test, a liquid-based cytology has recently become an alternative to conventional pap in detection of cervical cancer [11]. However, despite improvement in the sensitivity of pap smear cytology, its application in most hospitals in developing countries has been poor due to the its high cost. However, attempts have been made in several developing countries to develop an alternative liquid-based cytology from the local source that is cheaper and affordable. The present study is aimed at formulating a liquid-based cytology screening of cervical smears that can be combined with cytological (pap) and molecular (HPV) genotypes in order to develop a set of protocols to enhance screening accuracy of cervical smear samples among the women in Sokoto metropolis.

## 2.0 MATERIALS AND METHODS

### 2.1 STUDY AREA

The study was conducted at healthcare facilities in Sokoto metropolis, situated in the North-Western region of Nigeria, specifically at the General out Patient Department (GOPD) and Obstetrics & Gynecology (O&G) Department of Sokoto state specialist hospital, Maryam Abacha women and children hospital, and women and children welfare center. These hospitals provide healthcare services to Sokoto, Kebbi, and Zamfara states.

### 3.2 STUDY DESIGN

The study was a descriptive cross-sectional one, where a convenience sampling technique was employed to enlist female participants aged between 15 and 98 years old. The total sample size was determined to be162 samples. The state was home to a variety of ethnic groups, including Hausa/Fulani, Gobirawa, Zabarmawa, Kabawa, Adarawa, Arawa, Nupe, Yoruba, IBO's, and others. A structured questionnaire was then administered to those who had given their consent to collect the necessary data for the study.

### 3.5 SAMPLE SIZE DETERMINATION

The prevalence rate used by Nnadi *et al*, [12] was employed to calculate the sample size using the sample size formula. The formula used was $N=Z^2$ pq $/d^2$, where "p" represents the prevalence of abnormal cervical lesions (12%), Z=1.96, q=0.88, and d=0.05. Consequently, the total sample size was determined to be162samples.

### 3.6 SAMPLE COLLECTION

The samples for this research involved collecting samples from patients who consented to participate and attended the Obstetrics and Gynecology and General Out Patients Department of selected hospitals in Sokoto metropolis. Three types of pap smear sample preparations were used, namely conventional, commercially available liquid-based, and formulated liquid-based. A total of 486 samples were collected from 162 patients, with 162 samples processed using each of the three techniques.

### 3.7 ETHICAL CONSIDERATION

The study sorted ethical approval from the ethical and research committee of Sokoto State ministry of health. All participants who agreed to take part were informed about the research

objectives and the significance of cervical smear screening in preventing and controlling cervical cancer. Prior to participating, informed consent was obtained from each participant.

**RESULTS**

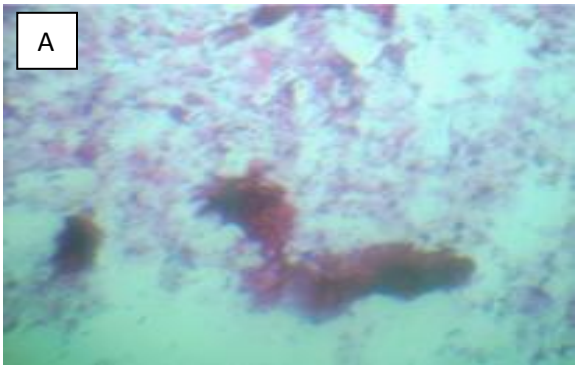
The standard liquid-based Pap method of preparation was used to process 162 cervical smear samples. Of these, 128 (79.0%) were found to be normal, 24 (14.8%) were abnormal, 7 (4.3%) were inadequate, and 3 (1.9%) were classified as acellular cervical smears.

**Table 1: Frequency and Percentage Distribution of Normal and Abnormal Smears**

| S/N | Type of Smear | Frequency (N) | Percentage (%) |
|---|---|---|---|
| 1 | Normal smears | 128 | 79.0 |
| 2 | Abnormal smears | 24 | 14.8 |
| 3 | Inadequate smears | 7 | 4.3 |
| 4 | Acellular smears | 3 | 1.9 |
| **Total** | | **162** | **100** |

**Table 2: Frequency and Percentage of Cervical Awareness in Sokoto Metropolis.**

| Cervical Cancer Awareness | Frequency (N) | Percentage (%) |
|---|---|---|
| **Have you heard about cervical cancer:** | | |
| Yes | 126 | 77.8 |
| No | 36 | 22.2 |
| **Total** | **162** | **100** |
| **How did you hear about cervical cancer:** | 49 | |
| Radio | 17 | 38.9 |
| Television | 32 | 13.5 |
| Friend | 28 | 25.4 |
| Other | | 22.2 |
| **Total** | **126** | 100 |



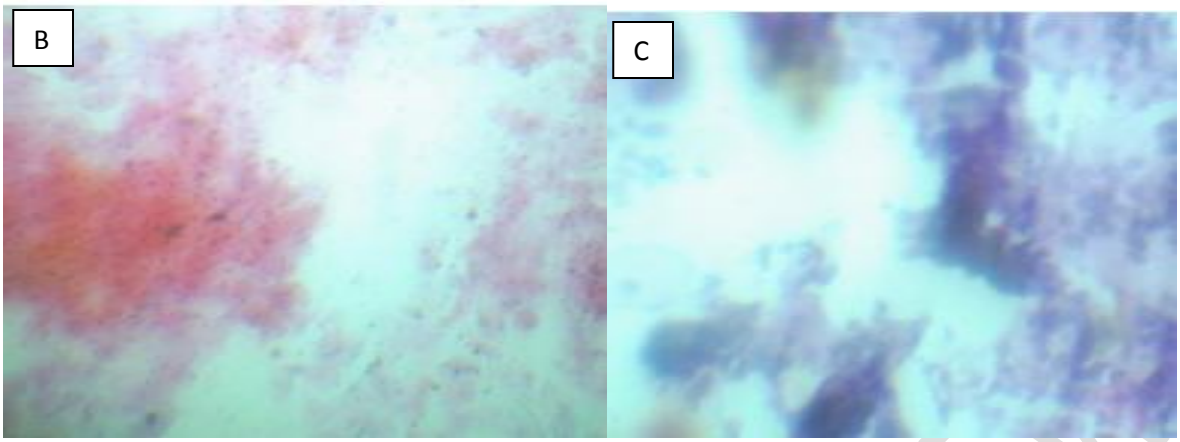



Plate1: (A) A standard liquid pap showing an atypical squamous cells of undetermined significant cervical smear (B): A liquid pap showing an infected cervical smear. (C): A standard liquid pap showing a low grade squamous cell intraepithelial lesion cervical smear X 100.

**DISCUSION**

Cervical cancer is a significant health issue, particularly in developing countries, and the study found a prevalence of 14.9% for abnormal smears and 4.4% for epithelial cell abnormalities in Sokoto metropolis. This is comparable to a study by Omeke [13] but higher than other studies conducted in Nigeria and Asia, such as a study by Ekwedigwe *et al.* [14] which found a prevalence of 6.3% in pregnant women in Abakaliki. A study carried out by Bakari *et al.* [15] found that 6% of women attending antenatal clinics at Ahmadu Bello University Teaching Hospital, Zaria had abnormal smears. Ago *et al*. [16] conducted research on pregnant women at University Teaching Hospital Calabar and found a prevalence of 3%. Nnadi *et al.* [17] detected abnormal smears in 11.3% of infertile women attending Usmanu Danfodiyo University Teaching Hospital Sokoto, while [18] detected a lower prevalence of 7.6% in a separate study. However, Khakwani *et al*. [19] reported a higher prevalence of 33.5% of cervical abnormal smears in the O & G department of Nishtar Hospital Multan, Pakistan. These variations in prevalence rates across different centers may be due to differences in the study populations, such as pregnant women and women with infertility.

The study also showed that awareness of cervical cancer in Nigeria was higher (77.8%) than in other African and Asian countries but lower than the level of awareness in a study conducted by Gitonga *et al.* [20] in Kiambu County, Kenya. Other studies conducted in rural India and Ghana revealed lower levels of awareness of cervical cancer among women. A study by Ken-Amoah et al. in 2022 [21] found poor knowledge and awareness of human papillomavirus and cervical cancer among adult females in rural Ghana. Olubodun *et al*. [22] found a low awareness level in their study on barriers and recommendations for a cervical cancer screening program among women in low resource setting, Lagos, Nigeria. Aga *et al*. [23] established an awareness rate of 70% in their study on assessing the knowledge, awareness, and perception among health and allied students at King Saud Bin Abdulaziz University, Jeddah campus, while Agboola *et al.* [24] found an awareness rate of 60% in their study on the determinants of knowledge of cervical cancer prevention among antenatal attendees in Ibadan, Southwest, Nigeria. Similarly, [25] reported an awareness level of 72% among female undergraduates in Makurdi, North central Nigeria, while Abugu and Nwagu [26] observed a low awareness level of 70.8% in their study on cervical cancer in women of faith-based organizations in Catholic Parish, Nsukka, and Enugu

State. Oguntayo *et al.* [27] found an awareness level of 52% in their study on cancer of the cervix in Zaria, Northern Nigeria. Finally, Ndikem and Ofi [28] reported an extremely low awareness level in their study on awareness, perception, and factors affecting utilization of cervical cancer screening services among women in Ibadan, Nigeria. The varying levels of awareness in these studies may be attributed to the differences in study areas, as some were conducted in urban areas while others were conducted in rural areas. Access to information may also have played a role in the urban-based studies.

Cytology is a more advanced version of the standard pap smear test which is commonly used for screening cervical cancer. The first generation of the liquid-based cytology has greatly enhanced the quality of cervical smears by preparing slides in a standard way after collecting samples, resulting in a more representative specimen with minimal obscuring background material. This has enabled a more reliable screening process and a higher detection rate of pre-malignant lesions, while reducing the number of indeterminate results like ASC [29]. Although the cost of this test is high, a newer generation of liquid-based cytology has been developed to address the cost issue of the standard method.

Formulated Liquid Based Cytology (FLBC) is a type of liquid-based cytology that does not require special equipment. In this study, the researchers compared FLBC with standard liquid-based cytology and conventional cytology, looking at morphological parameters such as cellular adequacy, uniform distribution, clean background, cell overlapping, cytoplasmic distortion, nuclear distortion, inflammatory background, and pap smear results. FLBC smears had lower cellularity (33.3%) than conventional cytology smears (88.9%). However, there was no statistically significant difference in cellularity between FLBC and conventional cytology smears ($P = 0.091$), and the level of agreement was also not significant ($k = 0.018$). These results support those reported in a previous study by Dhananjaya and Kumari [30], which found higher cellularity in FLBC preparations compared to conventional cytology. However, other studies such as Manjunath and Sheetal [31], and Mittal *et al.* [32] found higher cellularity in FLBC compared to conventional cytology. This difference could be due to variations in the reagents used for FLBC preparation. The study also found that FLBC smears had a cleaner background (86.8%) compared to conventional cytology smears (49.4%), but there was no statistically significant difference between the two methods in terms of cellular distribution.

## CONCLUSION

The prevalence of abnormal cervical smears was found to be 14.8%. The study revealed that the level of awareness of cervical cancer in Sokoto metropolis was 77.8%. Finally, the formulation showed potential as an alternative to the standard liquid-based pap preparation.

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