

# 5-Year Retrospective Study of the Prevalence of Cervical Lesions at the University of Benin Teaching Hospital, Nigeria

Lilian E. Chris-Ozoko<sup>1</sup>, Mary U. Barovbe<sup>1</sup>, John C. Oyem<sup>2</sup>, Victor J. Ekanem<sup>3</sup>

## ABSTRACT

**Introduction:** Cervical cancer is a significant cause of death among women in developing countries. It is considered as the second most common cancer occurring in women and the third leading cause of death from cancer worldwide. We determined the patterns of cervical lesions as well as their prevalence at the University of Benin Teaching Hospital for the period of five preceding years in Nigeria. **Material and Methods:** This was a 5-year retrospective study conducted at the University of Benin Teaching Hospital (UBTH), a tertiary health facility in Benin City, Nigeria. Data were obtained from records of all patients, who were screened for cervical cancer in the Department of Morbid Anatomy, University of Benin. Permission was obtained from the UBTH Ethics Committee. The Bethesda Standardized System was used to classify patients' pap smears. **Results:** Among the 2115 pap smears that were considered appropriate, 76.7%, 9.2%, 3.4%, 3.2%, 0.7%, 0.5% and 0.14% respectively were Normal, Negative for intraepithelial lesion or malignancy (NILM) with acute cervicitis (NAC), Negative for intraepithelial lesion or malignancy with moderately severe acute cervicitis (NMSAC), Atypical squamous cells of undetermined significance (ASCUS), Low grade squamous intraepithelial lesion (LGSIL), High grade squamous intraepithelial lesion (HGSIL) and squamous cell carcinoma (SCC) respectively. Our study recorded a 20% prevalence of cervical cancer with 94% of the precancerous cervical lesion occurring between 30 – 39 years. **Conclusion:** This study on the patterns of cervical lesion in UBTH, indicated that pap diagnosed as Negative for epithelial lesion or malignancy with acute cervicitis (NAC) was predominant compared to other precancerous lesions.

**Keywords:** Cervical cancer, Papanicolaou smear, Cervical lesion

## INTRODUCTION

Cervical cancer is regarded as the second most common cancer in women and the third leading cause of cancer deaths globally [1]. Its etiology is believed to have an indirect development from the normal epithelium as a result of intra epithelial neoplasm [2]. According to Larry et al. about one third of all untreated pre-cancerous lesions develop into cancer in approximately 10 to 15 years [3].

Research has shown that various subtypes of Human papillomavirus (HPV) are one of the key causative agents in the pathogenesis of cervical cancer [4, 5]. HPV is described as a sexually transmitted virus specialized in cell inflammations leading to invasive [4]. Other factors that may synergistically work with HPV to increase the risk of cervical cancer include smoking and cellular changes in the cervical epithelium [6].

These cellular changes are classified according to the 2001 Bethesda System as; Atypical Squamous Cells of Undetermined Significance

<sup>1</sup>Department of Human Anatomy and Cell Biology, Faculty of Basic Medical Sciences, Delta State University Abraka, Nigeria.

<sup>2</sup>Department of Human Anatomy, College of Health Science, Faculty of Basic Medical Sciences, University of Port Harcourt, Nigeria.

<sup>3</sup>Department of Histopathology, University of Benin Teaching Hospital, Benin City, Nigeria.

**Corresponding author:** John C. Oyem, MsC- [johnoyem2018@gmail.com](mailto:johnoyem2018@gmail.com)

(ASCUS), Low-Grade Squamous Intra-Epithelial Lesion (LGSIL), High-Grade Squamous Intraepithelial Lesions (HGSIL) and Squamous Cell Carcinoma (SCC). The Bethesda System of cervical cancer classification was used to replace the stages of dysplasia and carcinoma in situ with two levels, Low grade squamous intra epithelial lesion (LSIL) and High grade squamous intra epithelial lesion (HSIL) which was used previously used to classify the levels of cervical cancer [7].

Globally, approximately 465,000 new cases of cervical cancer are diagnosed yearly, and about 200,000 patients are reportedly dying [1]. In Sub-Saharan Africa, approximately 60-75% of women who live in rural areas developed cervical cancer [8, 9]. Furthermore, studies conducted in Africa (29.3 per 100,000) demonstrated a higher standard age of cancer development compared with the lower rate of 11.9 in Europe and a much lesser rate of 7.7 in North America [9 - 11]. However, in Nigeria, approximately 47.72 million women are exposed to a high risk of cervical lesions with a natural occurrence of 17.1 per 100,000 populations, and 8,240 out of 14,089 recorded cases of Nigerian women with cervical lesions die annually from cervical cancer [11].

The use of Papanicolaou test in the screening of cervical lesions has played a vital role in the early diagnosis and the reduction of the mortality rate of cervical cancer in women [12]. It is the most common, inexpensive and safest method applied in the screening of cervical cancer, which was reported to reduce the prevalence of cervical cancer by 70% between 1955 and 1992 [9, 13].

Studies have focused on many forms of cancer, most especially breast cancer in other parts of the world, neglecting the prevalence of cervical cancer in Sub-Saharan Nigeria, where this form of cancer is the second leading cause of mortality among women [1, 8, 9, 11]. It is consequently imperative to carry out a retrospective study of the prevalence of cervical lesions in Nigeria. The current study is aimed at evaluating the patterns and prevalence of cervical lesions at the University of Benin Teaching Hospital for the period of five years in Nigeria.

## **MATERIAL AND METHODS**

Approval for this study was obtained from the Research and Ethics Committee of the Department of Human Anatomy and Cell Biology, Delta State University, Abraka and UBTH Ethics Committee, Nigeria with reference number DELSU/CHS/ANA/12/39.

This research adopted a retrospective design, involving the records of all patients who were screened for cervical cancer in the Department of Morbid Anatomy, University of Benin Teaching Hospital (UBTH), Nigeria during a 5 years period commencing from January 1st, 2013 and ending December 31st, 2017. UBTH is one of the major teaching hospitals located in Benin, Edo state which is in the southern part of Nigeria.

Medical information such as patients' age and pattern of cervical lesion was obtained from patients' case files in the institution's Pathology Department archives.

The study included all registered and archived UBTH cases of cervical lesion screened during the 5 years period. Only subjects whose names were on the UBTH registry for the period of study were used. Records in which age was not specified were excluded.

Pap smear was performed by collecting cells with the aid of a speculum at the outer opening of the cervix. Collected cells are made into smears, fixed in 90% alcohol and stained using Papanicolaou stains. For microscopic analysis, stained and mounted slides were captured using digital compound microscope (Brunel SP35 Digital, model: DN-107T, No000026), and were reviewed in accordance with Bethesda Standardized System of classification as follows:

- **Normal:** NILM: Negative for intraepithelial lesion or malignancy.
- **Inflammatory:** NAC: Negative for intraepithelial lesion or malignancy with acute cervicitis.
- **NCC:** Negative for intraepithelial lesion or malignancy with chronic cervicitis.
- **Abnormal:** NMSAC: Negative for intraepithelial lesion or malignancy with moderately severe acute cervicitis.

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- **LGSIL:** Low grade squamous intraepithelial lesion.
- **HGSIL:** High grade squamous intraepithelial lesion.
- **ASCUS:** Atypical squamous cells of undetermined significance.
- **Unsatisfactory:** Unsatisfactory/inadequate.

Type of cervical lesion and age of patients was recorded for each case. The Statistical Package for the Social Sciences (SPSS) version 20, IBM and was used to analyze the data. The results were presented in tables and cytology micrographs.

**RESULTS**

Women with NILM accounted for the highest percentage within the study period, with the highest recorded percentage of 81% obtained in 2015. Patterns of cytology for negative respondents with inflammatory cells showed that patients with NAC had the highest percentage of occurrence when compared with NCC while among positive respondents, Negative for Intraepithelial Lesion or Malignancy with Moderately Severe Acute Cervicitis was highly prevalent from 2015 to 2016 but in 2017, Low Grade Squamous Intraepithelial Lesion (5%) recorded the highest percentage (5%) (Table 1).

**Table 1.** Results for patterns of cervical lesion from 2013 – 2017.

DIAGNOSIS	YEARS				
	2013	2014	2015	2016	2017
NILM	364(75%)	367(77%)	399(81%)	212(75%)	297 (75%)
NAC	41(8%)	50(11%)	47(9%)	36(13%)	22 (6%)
NCC	23(5%)	13(3%)	16(3%)	3(1%)	18 (5%)
NMSAC	28(6%)	13(3%)	9(2%)	7(2%)	12 (3%)
ASCUS	1(0.2%)	7(1%)	4(1%)	2(1%)	1 (0.3%)
LGSIL	11(2%)	10(2%)	8(2%)	3(1%)	20 (5%)
HGSIL	3(1%)	4(1%)	0(0%)	0(0%)	3 (1%)
SCC	0(0%)	0(0%)	0(0%)	1(0.4%)	2 (1%)
UNSAT	15(3%)	12(3%)	12(2%)	19(7%)	21(5%)
<b>TOTAL</b>	<b>486</b>	<b>476</b>	<b>495</b>	<b>283</b>	<b>396</b>

\*NILM = Negative for Intraepithelial Lesion or Malignancy. NAC= Negative For Intraepithelial Lesion or Malignancy with Acute Cervicitis. NCC= Negative for Intraepithelial Lesion or Malignancy with Chronic Cervicitis. NMSAC= Negative for Intraepithelial Lesion or Malignancy with Moderately Severe Acute Cervicitis SCC= Squamous Cell Carcinoma. ASCUS= Atypical Squamous Cells of Undetermine Significancy. LGSIL= Low Grade Squamous Intraepithelial Lesion. HGSIL= High Grade Squamous Intraepithelial Lesion. UNSAT = Unsatisfactory.

Table 2. Cytology results of respondents according to their age

AGE	DIAGNOSES								
	NILM	NAC	NCC	NMSAC	ASCUS	LGSIL	HGSIL	SCC	UNSAT
15-19	25(2%)	0(0%)	0(0%)	1(2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
20-24	56(3.4%)	10(6%)	1 (1%)	4(6%)	0(0%)	2(6%)	0(0%)	0(0%)	3(5%)
25-29	143(14%)	18(10%)	7(13%)	7(12%)	1(7%)	1(3%)	1(14%)	0(0%)	3(5%)
30-34	237(21%)	41(24%)	9(16%)	14(24%)	0(0%)	4(13%)	1(14%)	0(0%)	10(17%)
35-39	293(18%)	42(24%)	12(22%)	7(10%)	4(29%)	4(13%)	1(14%)	0(0%)	13(22%)
40-44	311(19%)	30(17%)	14(25%)	10(14%)	6(43%)	11(21%)	3(43%)	0(0%)	9(16%)
45-49	301(18%)	33(19%)	12(22%)	15(22%)	3(21%)	15(47%)	1(14%)	1(33%)	10(17%)
50-54	128 (8%)	8 (4%)	6 (8%)	4 (6%)	0(0%)	6(19%)	1(14%)	0(0%)	0(0%)
55-59	92(5%)	10 (5%)	8 (11%)	6 (9%)	1(7%)	2(6%)	1(14%)	1(33%)	0(0%)
60-64	28 (2%)	1 (1%)	2 (3%)	1 (1%)	0(0%)	4(13%)	1(14%)	0(0%)	5(9%)
65-69	19 (1%)	2 (1%)	1 (1%)	0 (0%)	0(0%)	2(6%)	0(0%)	1(33%)	5(9%)
70-above	6 (0.4%)	1 (1%)	1 (1%)	0 (0%)	0(0%)	1(3%)	0(0%)	0(0%)	0(0%)
<b>TOTAL</b>	<b>1639</b>	<b>196</b>	<b>73</b>	<b>69</b>	<b>15</b>	<b>52</b>	<b>10</b>	<b>3</b>	<b>58</b>

\*Abbreviations are the same as previous Table.

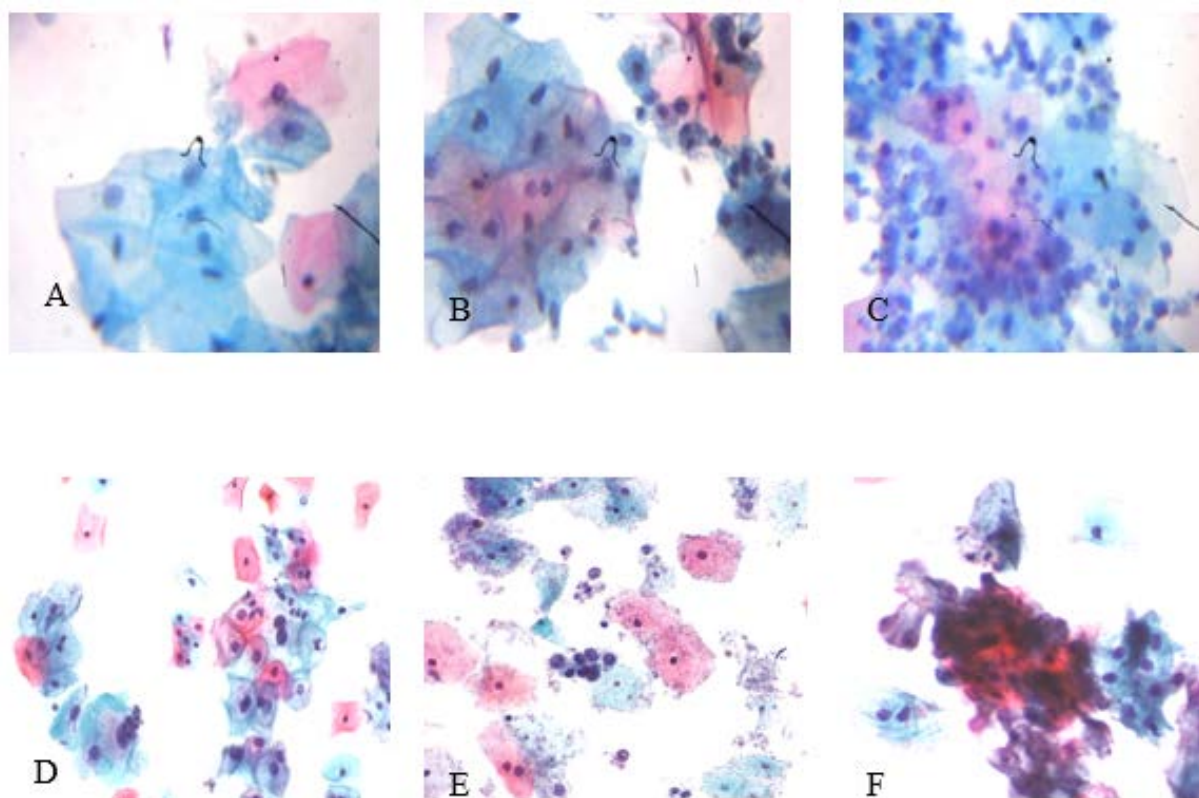
Table 3. Patterns of cervical lesions observed for the period of 5 years.

Diagnosis	Frequency	Percentage (%)
NILM	1639	76.7
NAC	196	9.2
NCC	73	3.4
NMSAC	69	3.2
ASCUS	15	0.7
LGSIL	52	2.4
HGSIL	10	0.5
SCC	3	0.14
UNSAT	79	3.4
<b>Total</b>	<b>2136</b>	<b>100</b>

\*Abbreviations are the same as previous Table.

**Table 4.** Summary of patterns of cervical lesion diagnosis in percentages.

OUTCOME	FREQUENCY	PERCENTAGE
NORMAL	1639	77.0%
INFLAMMATORY	338	16.0%
ABNORMAL	80	4.0%
UNSATISFACTORY	58	3.0%
TOTAL	2115	100%

**Figure 1.** Cytological micrographs of various cervical lesions.

**Figure 1.** a) Negative for intraepithelial lesion or malignancy (PAP,  $\times 400$ ). b) Negative for intraepithelial lesion or malignancy with acute cervicitis (PAP,  $\times 400$ ). c) Negative for intraepithelial lesion or malignancy with chronic cervicitis (PAP,  $\times 400$ ). d) Low grade squamous intraepithelial lesion (H and E,  $\times 400$ ) e) High grade squamous intraepithelial lesion (PAP,  $\times 400$ ). f) Atypical squamous cells of undetermined significance (PAP,  $\times 400$ ).

Table 2 demonstrates that the majority of the cervical lesions occurred between 30 – 49 years. In normal smears, the 23% which was the highest percentage was recorded in the subjects between 40 – 44 years. For acute and chronic cervicitis, the highest percentage was seen in patients between 30 – 34 years (24%) and 40 – 49 years (22%) respectively. The table also showed highest recorded percentages of NMSAC (24%) in 30 – 34 years patients, LGSIL (49%) in 45 – 49 years patients, HGSIL (43%) in 40 – 44 years patients.

SCC had a percentage of 33% in 45 – 49, 55 – 59, and 65 – 69 years patients.

For the period of years, 76.7% of the respondents were presented with NILM while 9.2% of the respondents were negative for intraepithelial lesion but with acute cervicitis compared to 3.4% of the respondents that were presented with chronic cervicitis. For respondents with abnormal smears, the highest percentages of 3.4% and 3.2% were recorded in NMSAC and LGSIL respectively.

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Table 4 above shows the diagnostic representation in percentages of the patterns of cervical lesions. NILM recorded the highest frequency with a percentage of 77%, which was followed by inflammatory smear with a percentage of 16%. The abnormal lesions which comprised Atypical Squamous Cells of Undetermined Significance, Low Grades Intraepithelial Lesions, High grade Intraepithelial Lesion and Squamous Cell Carcinoma recorded a percentage of 4% while 3% smears were described as unsatisfactory.

### DISCUSSION

Cervical cancer is the second most common neoplasm in women globally with a high burden in developing countries such as Nigeria [14]. Cervical cancer is regarded as a malignant neoplasm of the squamous lining of the cervix [15]. In Nigeria, the incidence of cervical in 2005 was 25 /100,000 and over 10,000 women deaths have been reported from cervical cancer [16]. Initially it manifests as minor symptoms which may be ignored; with time, it progresses into a cancerous stage. At this stage, all therapeutic interventions will only produce slight improvement in the prognosis. However, community-based and population-based screenings for cervical cancer have significantly decreased the incidence and mortality rate of this form of cancer [17]. The present study recorded 418 cases of abnormal and inflammatory smears over the 5 years period (2012 - 2017) in the Department of Morbid Anatomy, University of Benin Teaching Hospital, Nigeria with Negative for intraepithelial lesion or malignancy with acute cervicitis (NAC), accounting as the highest recorded pattern of precancerous cervical lesion among patients with inflammatory and abnormal smears.

Findings from this study showed a prevalence of 20%. This percentage is higher when compared to the study of Obaseki and Nwafor in 2013 [18], which reported a prevalence of 16.2% and that of Aydin et al. which reported a prevalence of 9.4% in Antalya, Turkey in community-based screening for cervical cancers [19]. Our study also reported a higher prevalence when compared to that of Manjit et al. [20], who reported a prevalence of 5% and Verma et al. [21] who reported a prevalence

of 13.6% in women presented with unhealthy cervix. A similar study reported no evidence of cervical cancer among 270 Muslim women screened for cervical cancer in 2010 in a rural community in India [22]. The low prevalence reported in Yasmeen's study was attributed to absence of sexual activity and promiscuity and female genital mutilation [22].

Our study revealed that 94% of subjects between the ages of 35 – 49 years presented at least one form of cervical lesion, while only 0.2% of subjects below 20 years presented with abnormal and inflammatory smears. This is in line with the report of the American Cancer Society which stated that the prevalence of cervical cancer is higher in women between the ages of 35 and 44 with the average age at diagnosis being 50 [23].

It rarely occurs in females below the age of 20. Our study also demonstrated that 4% of the studied population presented with abnormal and inflammatory smears in women between 60 years and above. This value is lesser compared to the 20% cases of cervical cancer reported in Women over 65 years of age in the United States of America [23].

Furthermore, the present study demonstrated 76.7%, 9.2%, 3.4%, 3.2%, 0.7%, 0.5% and 0.14% of Normal (NILM), Negative for intraepithelial lesion or malignancy with acute cervicitis (NAC), Negative for intraepithelial lesion or malignancy with moderately severe acute cervicitis (NMSAC), Atypical squamous cells of undetermined significance (ASCUS), Low grade squamous intraepithelial lesion (LGSIL), High grade squamous intraepithelial lesion (HGSIL) and squamous cell carcinoma (SCC), respectively. These values are in tandem with the likely trend of cervical lesions reported by WHO in 2014 [11], on the expected prevalence of cervical cancer; LGSIL (low grade squamous intraepithelial lesion): 3-10%; HGSIL (high grade intraepithelial squamous lesion): 1-5%; and invasive cervical cancer: 0.2 - 0.5% in an unscreened population of women aged 25-65 years. A community base cervical cancer screening program in India among Delhi women of India recorded 4.67% for carcinoma-in-situ and 1.4% for high grade malignancy. A similar study by Verma et al. [21], on 125 patients who attended Out Patient Department in Hospital reported 97.6% (122) Pap

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smears as satisfactory smears for evaluation, 15.20% (19) normal smears, 68.80% (86) were negative for intraepithelial lesion or malignancy, 13.6% (17) as epithelial cell with abnormality, 2.4% were unsatisfactory, 4.8% were ASCUS, 5.6% were LSIL, 0.8% were HSIL, 0.8% squamous cell carcinoma, 0.8% were atypical glandular cells and 0.8% were adenocarcinoma [22]. Another retrospective study by Manjit et al. reported a prevalence of 0.3%, 3.4%, 2.7% and 0.7% in ASCUS, SIL, LSIL and HSIL respectively [20]. Differences obtained in the prevalence of cervical cancer between this study and previous studies may be attributed to individuals' exposure to the risk factors of cervical cancer such as age at first sexual intercourse and marriage, number of sexual partners, family background of cervical cancer, Human Papillomavirus (HPV) [4], socioeconomic determinants (such as poverty) [4, 14].

Furthermore, we recorded 58 (3%) cases of unsatisfactory smears out of 2115 cases of cervical cancer. This 3% of unsatisfactory pap smears is comparable to the 2.4% recorded by Verma et al. and 3.8% of unsatisfactory smear reported by Sankaranarayanan et al. [21, 25]. We adopted the use of cytobrush, plastic spatula in the preparation of Pap smears and all smears were reported by a well-trained cytopathologist thus reducing technical bias.

## CONCLUSIONS

This study demonstrates that the prevalence of precancerous cervical lesion in south southern Nigerian women is 20%. Cytological smears diagnosed as Negative for epithelial lesion or malignancy with acute cervicitis (NAC) was more predominant compared to other inflammatory and abnormal smears. Furthermore, the current study also showed that 94% of subjects between the ages of 35 – 49 years and 0.2% of subjects below 20 years presented with abnormal and inflammatory smears.

Thus, cervical cancer sensitization, screening and treatment services should be made easily available and accessible at the community level to screen, diagnose, and treat before cases progress.

## Recommendations

I. There is need for comprehensive health education campaign centered on lifestyles predisposing to cervical cancer and other diseases such as poor personal hygiene, early coitus starting age, multiple sexual partners as well as creating awareness in areas where screening can be performed. This should be included in the curriculum of health education in health care facilities especially in our local communities.

II. There is a need to integrate cervical cancer screening into our primary health care delivery as it is the closest health care delivery system to rural communities.

III. Mass media should be used to disseminate information about cervical cancer and its prevention to the public using outlets such as radio television and newspaper articles.

IV. Faith based organizations, religious institutions, women's associations, Government and Non-Governmental organizations should organize awareness campaigns focused on the need for cervical screening. They may also collaborate and organize free cervical screening for women in rural areas.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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None.

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## RESUMO

*Estudo retrospectivo de 5 anos da prevalência de lesões de colo de útero no Hospital Universitário da Universidade de Benin, Nigéria*

**Introdução:** O câncer de colo de útero é uma causa significativa de morte entre mulheres nos países em desenvolvimento. É considerado o segundo câncer mais comum em mulheres e a terceira causa de morte por câncer em todo o mundo. Determinamos os padrões de lesões cervicais, bem como sua prevalência no Hospital Universitário da Universidade de Benin no período de cinco anos anteriores na Nigéria. **Material e Métodos:** Este foi um estudo retrospectivo de 5 anos conduzido no Hospital Universitário da Universidade de Benin (UBTH), uma unidade de saúde terciária em Benin, Nigéria. Os dados foram obtidos dos prontuários de todas as pacientes, que foram rastreadas para câncer cervical no Departamento de Anatomia Patológica da Universidade de Benin. A autorização foi obtida do Comitê de Ética da referida instituição. O Sistema Padronizado Bethesda foi usado para classificar os esfregaços de Papanicolau dos pacientes. **Resultados:** Entre os 2115 esfregaços de Papanicolau considerados adequados, 76,7%, 9,2%, 3,4%, 3,2%, 0,7%, 0,5% e 0,14%, respectivamente, foram normais, negativos para lesão intraepitelial ou malignidade (NILM) com cervicite aguda (NAC), Negativo para lesão intraepitelial ou malignidade com cervicite aguda moderadamente grave (NMSAC), Células escamosas atípicas de significado indeterminado (ASCUS), Lesão intraepitelial escamosa de baixo grau (LGSIL), Lesão intraepitelial escamosa de alto grau (HGSIL) e carcinoma espinocelular (SCC), respectivamente. Nosso estudo registrou uma prevalência de 20% de câncer de colo de útero com 94% das lesões cervicais pré-cancerosas ocorrendo entre 30 - 39 anos. **Conclusão:** Este estudo sobre os padrões de lesão de colo de útero na em UBTH indicou que papanicolaus negativos para lesão epitelial ou malignidade com cervicite aguda (NAC) foram predominantes em comparação a outras lesões pré-cancerosas.

**Palavras-chave:** câncer de colo de útero, Papanicolau, lesão de cérvix