PIONEER
MEDICAL JOURNAL
Vol.5 No.2 Jul. - Dec., 2025

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This article was inadvertently republished under Volume 5, No. 2 (July–December 2025)
following a redesign and restructuring of the journal website.
The correct bibliographic designation for this article is Volume 14, No. 7 (January–June 2026),
under which it was originally published.
This correction affects only the volume, issue, and publication-period metadata.
The article content, DOI, authorship, pagination, and publication date remain unchanged.

www.pioneermedicaljournal.com
ISSN: 2354 - 1954
Official Publication of The Medical and Dental Consultants' Association of Nigeria ***(MDCAN)***
FMC, Umuahia Chapter.

PIONEER MEDICAL JOURNAL

OFFICIAL SCIENTIFIC PUBLICATION OF MEDICAL AND DENTAL CONSULTANTS ASSOCIATION OF NIGERIA (MDCAN)

FEDERAL MEDICAL CENTRE UMUAHIA ABIA STATE NIGERIA

CERVICAL CYTOLOGY SCREENING PATTERNS AND OUTCOMES: A SEVEN-YEAR RETROSPECTIVE ANALYSIS AT FEDERAL MEDICAL CENTRE, UMUAHIA

Olushola Olakunle Jegede1*, Cornelius C Chukwuegbo[1],Emeka Stanley Ogbata[1], Edoiseh Felix Ehidiamhen[2], Martin Anazodo Nnoli[3]

[1]*Department of Anatomic Pathology, David Umahi Federal University of Health Sciences, Uburu, Ebonyi State / Federal Medical Centre, Umuahia , Abia State, Nigeria.*

[2]*David Umahi, Federal University of Health Sciences, Department of Pathology, Uburu, Ebonyi State Nigeria.*

[3]*University of Calabar Teaching Hospital, Department of Pathology, Calabar, Cross River State, Nigeria.*

**Corresponding Author: skajegs@gmail.com*

ABSTRACT

Background: Cervical cancer remains a significant public health concern globally, with the highest burden in low- and middle-income countries. Cytology-based screening using the Papanicolaou (Pap) smear test has been the cornerstone of cervical cancer prevention programs. Understanding local screening patterns and cytological findings is essential for effective cervical cancer control strategies.

Objective: This study aimed to analyze the patterns, distribution, and outcomes of cervical cytology screening at Federal Medical Centre, Umuahia over a seven-year period (2018-2024), evaluate the prevalence of epithelial cell abnormalities, and determine age-specific screening patterns.

Methods: A retrospective descriptive study was conducted analyzing 1,092 Pap smear records from January 2018 to December 2024. Data extracted included patient age, clinical indications, and cytological diagnoses classified according to the 2014 Bethesda System. Descriptive statistics, chi-square tests, independent t-tests, and one-way ANOVA were used for statistical analysis.

Results: The study analyzed 1,092 cervical cytology specimens with a mean patient age of 40.99 ± 11.72 years. Peak screening occurred in the 30–39 years age group (37.0%). Negative for intraepithelial lesion or malignancy (NILM) accounted for 93.4% of diagnoses. Epithelial cell abnormalities were detected in 4.16% of the 1,083 satisfactory specimens (excluding 9 unsatisfactory cases from the denominator), with ASCUS being the most common (1.75%). The ASCUS:SIL ratio was 1.36:1, a key benchmark of diagnostic stringency indicating that ASCUS is not being overused relative to definitive squamous intraepithelial lesion diagnoses, with an optimal range of 1:1 to 2:1. The unsatisfactory specimen rate was remarkably low at 0.82%. Women with abnormal cytology were significantly older (mean 50.81 vs 40.56 years, $p<0.0001$).

Conclusion: This study demonstrates a low prevalence of cervical cytological abnormalities and excellent quality indicators (unsatisfactory rate 0.82%; optimal ASCUS:SIL ratio 1.36:1) at our center. The significant age difference between normal and abnormal cytology (mean 50.81 vs 40.56 years, $p<0.0001$) underscores that the current opportunistic screening model is systematically missing the highest-risk demographic: women over 50 years. A specific policy shift is recommended, targeting catch-up cervical screening for all women over 50 presenting at any hospital clinic, not just gynecology. Enhanced community awareness and expanded targeted screening programs are essential.

Keywords: *Cervical cytology, Pap smear, Bethesda System, screening, cervical cancer, Nigeria, Southeast Nigeria, Abia State*

INTRODUCTION

Cervical cancer is the fourth most common cancer in women worldwide, with an estimated 604,000 new cases and 342,000 deaths in 2020. The disease burden is disproportionately high in low- and middle-income countries (LMICs), where approximately 85% of cases and 90% of deaths occur. In sub-Saharan Africa, cervical cancer ranks as the most common cancer among women in several countries, with Nigeria contributing significantly to the regional disease burden.

The natural history of cervical cancer, with its slow progression from precancerous lesions to invasive disease over 10–15 years, provides an excellent window of opportunity for screening and early intervention. The Papanicolaou (Pap) smear test, introduced by Dr. George Papanicolaou in the 1940s, revolutionized cervical cancer prevention and has led to dramatic reductions in cervical cancer incidence and mortality in countries with organized screening programs.

The Bethesda System for reporting cervical cytology, first introduced in 1988 and subsequently revised in 1991, 2001, and 2014, provides a standardized framework for reporting cytological findings. This system facilitates clear communication between laboratory and clinical personnel, ensures consistent diagnostic criteria, and guides clinical management decisions. The Bethesda System categorizes findings into: Negative for Intraepithelial Lesion or Malignancy (NILM), epithelial cell abnormalities including atypical squamous cells (ASCUS, ASC-H), squamous intraepithelial lesions (LSIL, HSIL), and glandular cell abnormalities.

In Nigeria, despite the high burden of cervical cancer, organized cervical screening programs remain largely unavailable, and opportunistic screening is not widespread. Nigeria introduced the national HPV vaccination programme in 2023 through the National Primary Health Care Development Agency, initially targeting girls aged 9–14 years in selected states, with plans for scale-up nationally; however, vaccine coverage remains limited and uneven across states, including Abia State where this study was conducted. In this context, secondary prevention through Pap smear screening remains the most accessible and immediately deployable tool for cervical cancer control. Studies from various Nigerian centers have reported variable screening uptake rates and cytological abnormality prevalence, reflecting differences in population characteristics, awareness levels, and healthcare-seeking behavior. Several barriers to effective cervical cancer

screening have been identified, including limited awareness, cultural beliefs, fear of diagnosis, cost implications, and inadequate healthcare infrastructure.

Federal Medical Centre, Umuahia serves as a major tertiary referral center in southeastern Nigeria, providing comprehensive gynecological services, including cervical cancer screening. The facility offers both opportunistic screening for women attending gynecology clinics and targeted screening for high-risk populations. Understanding the patterns and outcomes of cervical cytology at this center is crucial for several reasons: it provides baseline data for quality assurance initiatives, helps identify gaps in screening coverage, informs resource allocation decisions, contributes to the broader understanding of cervical disease epidemiology in Nigeria, and guides the development of targeted intervention strategies.

Previous studies from Nigeria have reported epithelial cell abnormality rates ranging from 2% to 15%, with significant variation across different geographic regions and population groups. These variations may reflect differences in underlying disease prevalence, population risk factors, screening protocols, and laboratory practices. The ASCUS:SIL ratio, which provides insight into cytological diagnostic patterns and quality, has also shown considerable variation in Nigerian studies.

The objectives of this study were fourfold: first, to determine the frequency and distribution of Pap smear examinations over the seven-year study period; second, to analyze the demographic characteristics of women undergoing cervical cytology screening; third, to evaluate the spectrum of cytological diagnoses according to the Bethesda System; and fourth, to assess the prevalence of epithelial cell abnormalities and identify associated factors. The findings will contribute to understanding cervical cytology patterns in southeastern Nigeria and inform strategies for improving cervical cancer prevention efforts.

MATERIALS AND METHODS

Study Design and Setting

This was a retrospective descriptive study conducted at the Cytopathology Laboratory of the Federal Medical Centre, Umuahia, Abia State, Nigeria. The center is a 300-bed tertiary healthcare facility providing comprehensive gynecological services, including cervical cancer screening, to residents of Abia State and neighboring states in southeastern Nigeria.

Study Period

The study covered a seven-year period from January 2018 to December 2024, representing a comprehensive assessment

of cervical cytology practice during this timeframe.

Data Source and Collection

Data were extracted from the cytopathology laboratory registers and archived cytology reports. Variables collected included patient age, clinical presentation/indication for screening, and cytological diagnosis. All data were anonymized to maintain patient confidentiality.

Specimen Collection and Processing

Cervical samples were collected using the conventional Pap smear technique by trained gynecologists and nurses. Samples were obtained from the ectocervix and endocervix using an Ayre spatula and an endocervical brush, respectively. Smears were immediately fixed in 95% ethyl alcohol and transported to the cytopathology laboratory.

All specimens were processed according to standard protocols and stained using the Papanicolaou staining method. Smears were examined microscopically by qualified cytopathologists, and findings were reported using the 2014 Bethesda System for Reporting Cervical Cytology. All 45 cases with epithelial cell abnormalities were subjected to blind review by a second qualified cytopathologist to ensure diagnostic consistency and inter-observer reliability; discordant cases were resolved by consensus review. The two pediatric cases (ages 3 and 4 years) were retained in the overall datasets as they had valid cytological reports, but were excluded from the mean age calculation and from the abnormality prevalence analysis to avoid skewing the demographic and cytological statistics.

Cytological Classification

Cytological diagnoses were categorized according to the Bethesda System 2014 as follows:

1. Negative for Intraepithelial Lesion or Malignancy (NILM): Specimens showing normal cellular components or non-neoplastic findings.

2. Epithelial Cell Abnormalities:

• Squamous Cell Abnormalities: ASCUS (atypical squamous cells of undetermined significance), ASC-H (atypical squamous cells, cannot exclude HSIL), LSIL (low-grade squamous intraepithelial lesion), HSIL (high-grade squamous intraepithelial lesion)

• Glandular Cell Abnormalities: AGC/AGUS (atypical glandular cells of undetermined significance)

3. Unsatisfactory for evaluation: Specimens inadequate for diagnosis.

4. Other categories including atrophic changes.

Statistical Analysis

Data were analyzed using Python programming language (version 3.10) with pandas, numpy, scipy, and matplotlib libraries. Descriptive statistics including frequencies, percentages, means, standard deviations, and ranges were calculated for all variables.

Categorical variables were compared using chi-square test, while continuous variables were compared using independent t-test. One-way ANOVA was used for comparing means across multiple groups. Correlation analysis was performed to assess temporal trends. A p-value of less than 0.05 was considered statistically significant. The ASCUS:SIL ratio was calculated as the ratio of ASCUS cases to total squamous intraepithelial lesions (LSIL + HSIL).

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of Federal Medical Centre, Umuahia. The study utilized retrospective data from existing records, and all patient information was anonymized to protect confidentiality.

RESULTS

A total of 1,092 cervical cytology specimens were analyzed during the seven-year study period (January 2018 to December 2024). Annual case distribution showed a progressive increase from 105 cases in 2018 to a peak of 193 cases in both 2021 and 2022, followed by a gradual decline to 165 cases in 2024.

Patient Demographics

Age data were available for 900 patients (82.4%). The age of patients ranged from 3 to 96 years, with a mean of 40.99 ± 11.72 years and a median of 40.0 years (IQR: 32.0–48.0 years). The age distribution showed peak screening uptake in the 30–39 years age group (37.0%, n=333), followed by 40–49 years (26.0%, n=234), 20–29 years (15.5%, n=139), 50–59 years (11.7%, n=105), and ≥60 years (6.5%, n=58). Only 3.2% (n=29) of screened women were younger than 20 years, with two cases representing pediatric patients (Table 1 and Figure 2). To assess potential bias from missing age data (17.6%, n=192), the cytological diagnosis distribution of the age-unknown group was compared with that of the age-known group. The proportion of NILM diagnoses in the age-unknown group (91.7%, n=176/192) was similar to that in the age-known group (93.7%, n=844/900), and epithelial cell abnormalities were comparably distributed, indicating that the missing age data was likely random rather than systematically associated with any particular diagnostic

category, thereby minimizing selection bias in the age-related analyses.

Cytological Diagnoses

The distribution of cytological diagnoses according to the Bethesda System is shown in Table 2 and Figure 1. Negative for intraepithelial lesion or malignancy (NILM) was the predominant diagnosis, accounting for 93.41% (n=1,020) of all specimens. Among satisfactory specimens (n=1,083), the epithelial cell abnormality rate was 4.16% (n=45). The unsatisfactory specimen rate was remarkably low at 0.82% (n=9).

The breakdown of epithelial cell abnormalities is detailed in Table 3 and Figure 3. Atypical squamous cells of undetermined significance (ASCUS) were the most common abnormality, accounting for 1.75% (n=19) of satisfactory specimens, followed by low-grade squamous intraepithelial lesion (LSIL) at 0.83% (n=9), atypical glandular cells (AGC/AGUS) at 0.74% (n=8), high-grade squamous intraepithelial lesion (HSIL) at 0.46% (n=5), and atypical squamous cells cannot exclude HSIL (ASC-H) at 0.37% (n=4).

The ASCUS:SIL ratio was calculated as 1.36:1 (19 ASCUS cases to 14 SIL cases [9 LSIL + 5 HSIL]), which falls within the optimal range of 1:1 to 2:1. This ratio indicates appropriate diagnostic thresholds and good quality control in cytological interpretation.

Age Distribution by Cytological Diagnosis

Age data were available for 880 women with satisfactory specimens. Significant differences in mean age were observed across diagnostic categories (Table 4 and Figure 4). Women with NILM had a mean age of 40.32 ± 11.21 years, while those with epithelial cell abnormalities were significantly older. The mean ages for specific abnormalities were: ASCUS 50.00 ± 16.50 years, LSIL 47.17 ± 11.79 years, HSIL 55.60 ± 18.23 years, ASC-H 48.00 ± 13.45 years, and AGC/AGUS 54.17 ± 12.01 years.

When comparing women with any epithelial cell abnormality (combined ASCUS, LSIL, HSIL, ASC-H, and AGC/AGUS) to those with NILM, the difference in mean age was highly statistically significant (50.81 ± 14.86 years vs 40.56 ± 11.19 years, independent t-test: $t=4.54$, $p<0.0001$). One-way ANOVA confirmed significant age differences across all diagnostic categories ($F=5.23$, $p<0.0001$).

Temporal Trends in Abnormality Rates

Annual abnormality rates showed considerable fluctuation over the study period, ranging from a low of 0.67% in

2020 to a high of 8.33% in 2019. The abnormality rates by year were: 2018 (5.77%), 2019 (8.33%), 2020 (0.67%), 2021 (2.07%), 2022 (4.79%), 2023 (5.68%), and 2024 (3.66%). Pearson correlation analysis revealed no significant linear temporal trend in abnormality rates ($r=-0.227$, $p=0.624$). The marked decline in abnormality rates during 2020–2021 is most plausibly explained by the COVID-19 pandemic: lockdown measures, fear of hospital attendance, and redeployment of healthcare resources led to a shift toward predominantly routine low-risk screening rather than symptomatic or high-risk presentations, thereby reducing the yield of abnormalities detected in those years. This pandemic-related selection bias should be considered when interpreting any apparent temporal trends across the study period.

The predominance of NILM diagnoses was consistent across all years of the study period. The notable decline in abnormality rates in 2020–2021 may be attributable to the COVID-19 pandemic's impact on screening practices and healthcare-seeking behavior, with recovery in subsequent years supporting this interpretation.

Quality Indicators

The study demonstrated excellent quality indicators for cervical cytology screening. The unsatisfactory specimen rate of 0.82% was well below the acceptable benchmark of <5%, reflecting high-quality specimen collection and processing. The ASCUS:SIL ratio of 1.36:1 falls within the optimal range, indicating appropriate diagnostic criteria and inter-observer consistency in cytological interpretation. These quality metrics compare favorably with international standards and suggest robust laboratory practices.

DISCUSSION

This seven-year retrospective analysis of 1,092 cervical cytology specimens represents one of the larger single-center Pap smear studies from southeastern Nigeria. The study provides important insights into screening patterns, cytological findings, and quality indicators that have significant implications for cervical cancer prevention efforts in the region.

The epithelial cell abnormality rate of 4.16% in our study falls within the lower range of rates reported in previous Nigerian studies, which have varied from 2% to 15%. A study by Ijaiya et al. from Ilorin reported an abnormality rate of 8.5%, while Ayinde et al. from Ibadan documented 4.9%, and Thomas et al. from Calabar found 11.7%. Our relatively low abnormality rate may reflect several factors: a true low prevalence of cervical precancerous lesions in our screened population, the predominance of routine screening rather than

symptomatic presentations, good specimen quality allowing for confident negative diagnoses, and potentially different population risk profiles compared with other Nigerian regions.

The ASCUS:SIL ratio of 1.36:1 in our study is particularly noteworthy and represents an important quality indicator. The American Society for Colposcopy and Cervical Pathology recommends an optimal ASCUS:SIL ratio between 1:1 and 2:1, with ratios significantly higher than 2:1 suggesting overuse of the ASCUS category and ratios below 1:1 potentially indicating underdiagnosis. Our ratio of 1.36:1 falls squarely within this optimal range, indicating appropriate diagnostic thresholds and good inter-observer consistency. This compares favorably with other Nigerian studies: Audu et al. from Abuja reported 2.4:1, while Mustapha et al. from Kano found 3.1:1. The optimal ratio in our study reflects rigorous adherence to Bethesda System criteria and regular quality assurance practices.

The unsatisfactory specimen rate of 0.82% in our study is exceptional and well below the acceptable benchmark of <5% recommended by most cervical screening guidelines. This low rate reflects several strengths: adequate training of sample collectors, proper use of sampling devices (Ayre spatula and endocervical brush), immediate fixation in 95% ethyl alcohol, and standardized processing protocols. International studies typically report unsatisfactory rates between 1% and 5%, making our result particularly commendable. This quality indicator is crucial because high unsatisfactory rates necessitate repeat testing, increase costs, cause patient anxiety, and may result in loss to follow-up.

One of the most significant findings in our study is the highly significant age difference between women with normal and abnormal cytology. Women with epithelial cell abnormalities were on average 10 years older than those with NILM (mean age 50.81 vs 40.56 years, $p<0.0001$). This finding has important implications for screening strategies in our setting. While international guidelines typically recommend screening cessation at age 65 for adequately screened women, our data suggest that in the Nigerian context, where many women have not been adequately screened, maintaining vigilance for older women is crucial. The peak age for abnormalities in our study was 50–59 years, emphasizing the need for continued screening efforts in this age group.

The age distribution of our screening population, with peak uptake in the 30–39 years age group (37.0%), reflects the existing opportunistic screening model,

which predominantly captures women attending reproductive health services, including antenatal care, family planning, and gynaecology clinics. This model, while pragmatic, is systematically missing the highest-risk demographic identified in our own data: post-menopausal women over 50 years. Our findings show that this age group had the highest mean age of abnormal cytology (HSIL mean 55.60 years; AGC/AGUS mean 54.17 years), yet constituted only 18.2% of the screened population. In LMICs broadly, screening has been culturally and programmatically framed as a reproductive-age activity, creating a dangerous blind spot for older women who no longer attend antenatal or family planning services and who may incorrectly believe their cancer risk has passed with menopause. This misconception is particularly dangerous because cervical cancer risk from persistent HPV infection does not diminish after menopause, and post-menopausal atrophic changes can complicate cytological interpretation, making quality screening even more critical. A fundamental reframing of cervical screening as a lifelong health activity, not a reproductive one, is urgently needed in our setting.

The temporal trends in our data reveal interesting patterns. The progressive increase in screening volumes from 2018 to 2021–2022, followed by stabilization, likely reflects growing awareness of cervical cancer screening and improved service availability. However, the marked reduction in abnormality rates during 2020–2021 (0.67% and 2.07%, respectively) coincides with the COVID-19 pandemic period, suggesting potential selection bias during this time when primarily routine screening rather than symptomatic cases may have been conducted. The subsequent recovery in abnormality rates in 2022–2023 supports this interpretation.

The spectrum of cytological abnormalities in our study, with ASCUS being most common (1.75%), followed by LSIL (0.83%), AGC (0.74%), HSIL (0.46%), and ASC-H (0.37%), is generally consistent with the expected distribution in screening populations. The relatively high proportion of glandular abnormalities (AGC 0.74%) compared to HSIL (0.46%) is a particularly important finding that warrants emphasis. Unlike squamous abnormalities, which arise from the transformation zone and are readily sampled by conventional Pap smear, glandular abnormalities originate from the endocervical canal or endometrium and carry a higher risk of underlying significant pathology, including endocervical adenocarcinoma, endometrial carcinoma, and extrauterine malignancy. Studies report that up to 30–40% of AGC diagnoses are

associated with significant histological findings on follow-up colposcopy and biopsy. Furthermore, AGC is diagnostically more challenging and less reproducible than squamous lesions, with potential for both over- and under-diagnosis. The finding that AGC exceeded HSIL in our series is a signal that all women with AGC diagnoses at this centre must be prioritized for urgent colposcopic evaluation, endocervical sampling, and, where clinically indicated, endometrial biopsy. This is a management pathway that differs fundamentally from the approach to squamous abnormalities.

The presence of two pediatric cases (ages 3 and 4) in our dataset, both with NILM results, likely represents samples taken for investigation of other conditions rather than routine cervical cancer screening. While unusual, such cases occasionally occur in pediatric gynecology practice for evaluation of vaginal discharge or other symptoms.

Study Limitations in view of answering further research questions

This study has few limitations that should be acknowledged. First, the retrospective design limits our ability to collect comprehensive clinical information and follow-up data, preventing assessment of outcomes such as colposcopy findings, biopsy results, and treatment responses. Second, age data were missing for 17.6% of patients, which may introduce bias in age-related analyses, although the available data (n=900) still provide robust statistical power. Third, information on clinical indications for screening (routine vs symptomatic) was incomplete, limiting our ability to fully interpret the abnormality rates and their clinical context. Fourth, the lack of histological correlation for cytological abnormalities prevents validation of cytological diagnoses and assessment of sensitivity and specificity. Fifth, as a single-center study from a tertiary referral facility, our findings may not generalize to primary healthcare settings or other regions of Nigeria with different population characteristics and risk profiles. Sixth, we could not assess important screening program metrics such as coverage rates, repeat screening intervals, or follow-up compliance due to the retrospective nature of the study. Seventh, the fluctuating abnormality rates across years, particularly the marked decline during the COVID-19 pandemic period, may reflect selection bias rather than true temporal trends. Finally, we lacked data on important risk factors such as HIV status, parity, contraceptive use, smoking, and sexual behavior, which would have enriched the epidemiological analysis.

Despite these limitations, this study provides valuable baseline data on cervical cytology patterns in southeastern Nigeria

and demonstrates the feasibility of maintaining high-quality cytology services in resource-limited settings.

Clinical Implications and Recommendations

The findings of this study have several important clinical and public health implications. First, the excellent quality indicators (low unsatisfactory rate of 0.82% and optimal ASCUS:SIL ratio of 1.36:1) demonstrate that high-quality cervical cytology services can be maintained in Nigerian tertiary healthcare settings with appropriate training, standardized protocols, and quality assurance measures. These practices should be disseminated to other centers to improve overall screening quality nationwide.

Second, the significant age difference between women with abnormal and normal cytology (mean age 50.81 vs 40.56 years, $p<0.0001$) has important implications for screening strategies. While current efforts appropriately focus on the 30–49 age group, our data strongly support maintaining vigilant screening of women aged 50 and above. Targeted outreach programs should be developed to increase screening uptake in this older age group, addressing barriers such as misconceptions about post-menopausal cancer risk and competing health priorities.

Third, the low overall abnormality rate (4.16%), while reflecting good specimen quality, also suggests that screening is reaching a relatively low-risk population. Efforts to expand screening coverage to higher-risk groups, including HIV-positive women, those with multiple sexual partners, and women with symptoms, may improve the yield of screening programs. Integration of cervical cancer screening with HIV care services represents a particularly important opportunity.

Fourth, the relatively low screening volumes (averaging 156 cases per year at a tertiary center serving a population of over 5 million) highlight the need for enhanced community awareness and improved access to screening services. Community-based education programs, mobile screening units, and integration of screening with routine antenatal and family planning services could significantly increase uptake.

Fifth, the establishment of systematic follow-up mechanisms for women with abnormal cytology is crucial. Our retrospective design prevented assessment of follow-up rates, but establishing tracking systems, reminder protocols, and facilitated referral pathways would ensure that women with abnormal results receive appropriate colposcopy, biopsy, and treatment.

Future research should include prospective studies with histological correlation to validate cytological diagnoses and assess diagnostic accuracy, follow-up studies to evaluate outcomes and treatment responses, assessment of screening coverage and repeat screening rates in the catchment population, cost-effectiveness analyses comparing cervical cytology with HPV-based screening approaches, investigation of risk factors associated with abnormal cytology in the Nigerian context, and multicenter collaborative studies to generate regional and national data on cervical cancer screening patterns and outcomes.

CONCLUSION

This seven-year retrospective analysis of 1,092 cervical cytology specimens from the Federal Medical Centre, Umuahia, demonstrates that high-quality cervical cancer screening can be achieved in Nigerian tertiary healthcare settings. The study revealed a low epithelial cell abnormality rate of 4.16%, excellent quality indicators, including an unsatisfactory rate of 0.82% and an optimal ASCUS:SIL ratio of 1.36:1, and a significant age difference between women with abnormal and normal cytology (mean age 50.81 vs. 40.56 years, $p<0.0001$). These findings emphasize the importance of maintaining rigorous quality assurance in cytology services and implementing age-targeted screening strategies that prioritize women aged 50 and above. Critically, the data support a specific and actionable policy shift: FMC Umuahia should implement a catch-up cervical screening protocol for every woman over 50 years presenting at any hospital clinic, including internal medicine, surgical outpatient, and general outpatient departments, not exclusively gynaecology. This opportunistic but systematic approach would capture the highest-risk demographic that the current gynaecology-centered model consistently misses. Women with AGC/AGUS diagnoses must be fast-tracked for colposcopic evaluation given the disproportionate risk of significant underlying pathology. Continued efforts to expand screening coverage, ensure systematic follow-up of abnormal results, strengthen HPV vaccination uptake among eligible girls, and integrate screening with other healthcare services are essential for reducing the burden of cervical cancer in Nigeria.

ACKNOWLEDGMENTS

The author acknowledges all the Cytopathology laboratory staff of Federal Medical Centre, Umuahia for their work dedication and meticulous record keeping, which made this study possible.

CONFLICTS OF INTEREST

The author declares no conflicts of interest related to this study.

FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Table 1: Demographics and Clinical Characteristics

Characteristic	Value
Total specimens	1092
Study period	2018-2024 (7 years)
Age distribution (n=900)	
Mean ± SD	40.99 ± 11.72 years
Median (IQR)	40.0 (32.0–48.0) years
Range	3-96 years
Peak age group	30-39 years (37.0%)
Missing age data, n (%)	192 (17.6%)
Age groups, n (%)	
<20 years	29 (3.2%)
20-29 years	139 (15.5%)
30-39 years	333 (37.0%)
40-49 years	234 (26.0%)
50-59 years	105 (11.7%)
60-69 years	49 (5.4%)
≥70 years	9 (1.0%)
Missing	192 (17.6%)

Table 2: Cytological Diagnosis Distribution

Diagnostic Category	Number of Cases	Percentage (%)
NILM	1020	93.41
ASCUS	19	1.74
ASC-H	4	0.37
LSIL	9	0.82
HSIL	5	0.46
AGC/AGUS	8	0.73
Atrophic	10	0.92
Unsatisfactory	9	0.82
Other	8	0.73
Total	**1092**	**100.0**

Table 3: Epithelial Cell Abnormalities in Satisfactory Specimens

Category	N	Rate (%)
Total Satisfactory Specimens	1083	100.0
NILM	1020	94.18
Epithelial Cell Abnormalities	45	4.16
Squamous Cell Abnormalities:		
ASCUS	19	1.75
ASC-H	4	0.37
LSIL	9	0.83
HSIL	5	0.46
Glandular Cell Abnormalities:		
AGC/AGUS	8	0.74

Table 4: Age Distribution by Cytological Diagnosis

Diagnosis	N	Mean ± SD	Median (IQR)	Range
NILM	843	40.32 ± 11.21	39.0 (32.0-47.0)	3-96
ASCUS	17	50.00 ± 16.50	49.0 (35.0-59.0)	31-80
LSIL	6	47.17 ± 11.79	48.5 (37.5-55.0)	33-62
HSIL	5	55.60 ± 18.23	54.0 (52.0-59.0)	31-82
ASC-H	3	48.00 ± 13.45	44.0 (40.5-53.5)	37-63
AGC/AGUS	6	54.17 ± 12.01	58.0 (58.0-58.0)	30-63

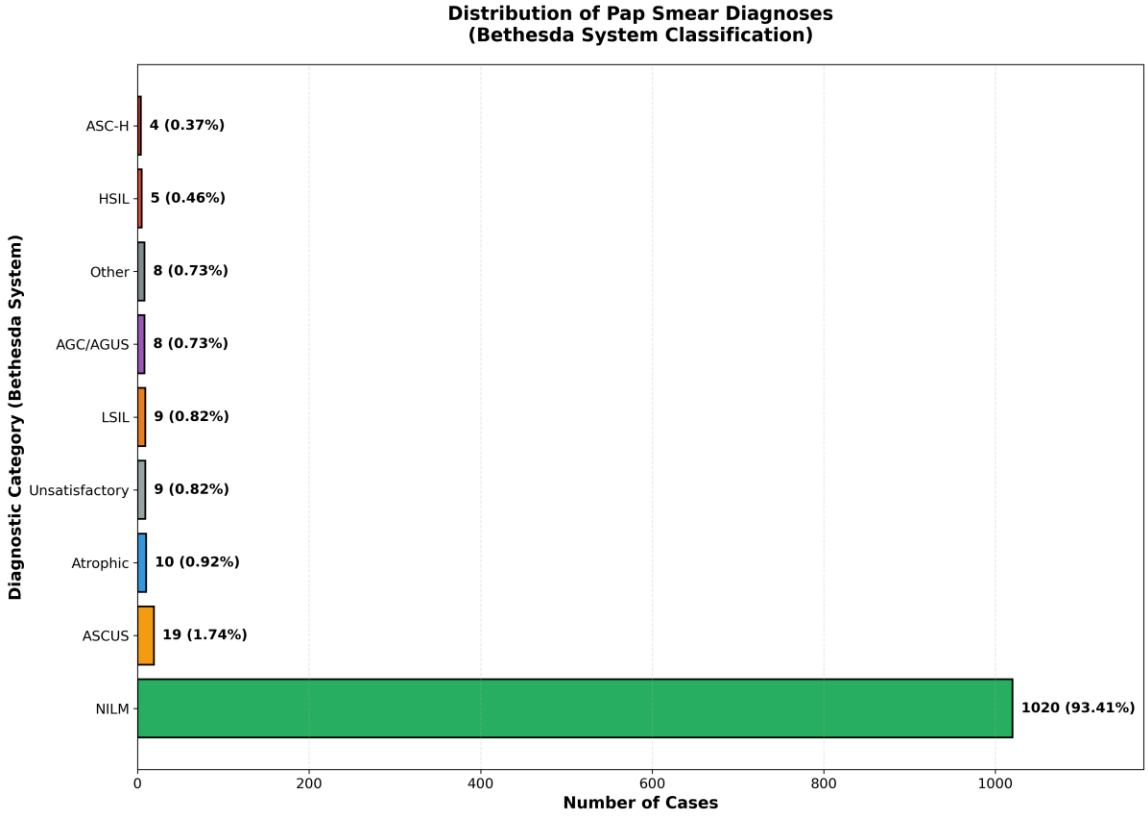

Figure 1: Distribution of cytological diagnoses according to the Bethesda System, showing NILM as the predominant category (93.4%).

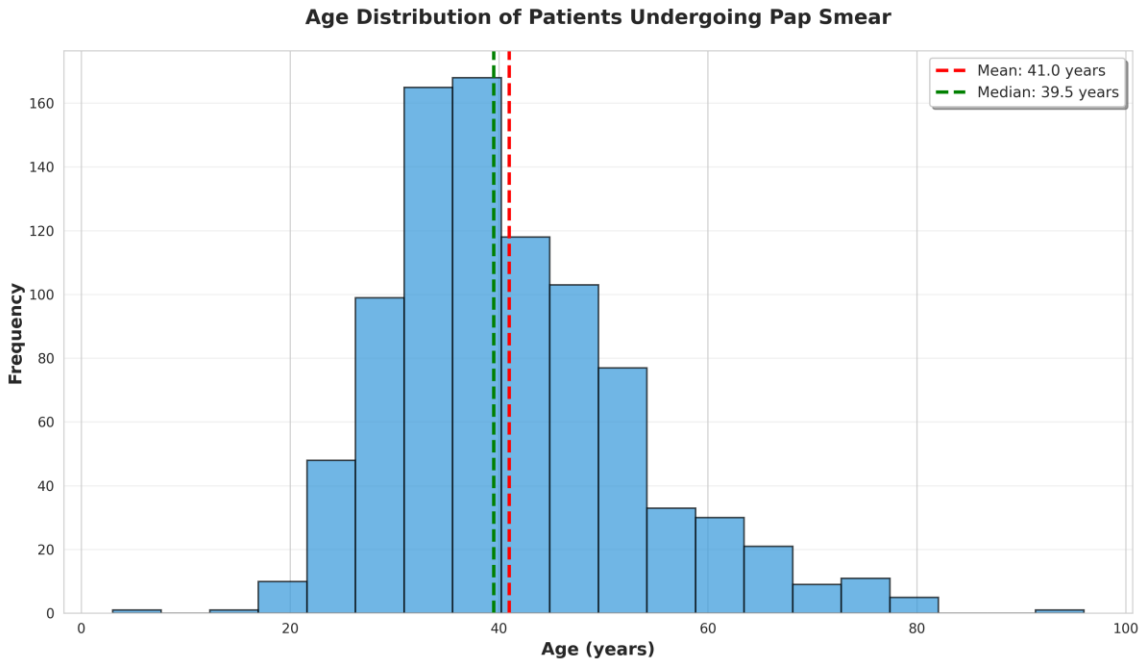

Figure 2: Age distribution histogram showing a peak frequency in the 30–49 years age group, with a mean age of 41.0 years.

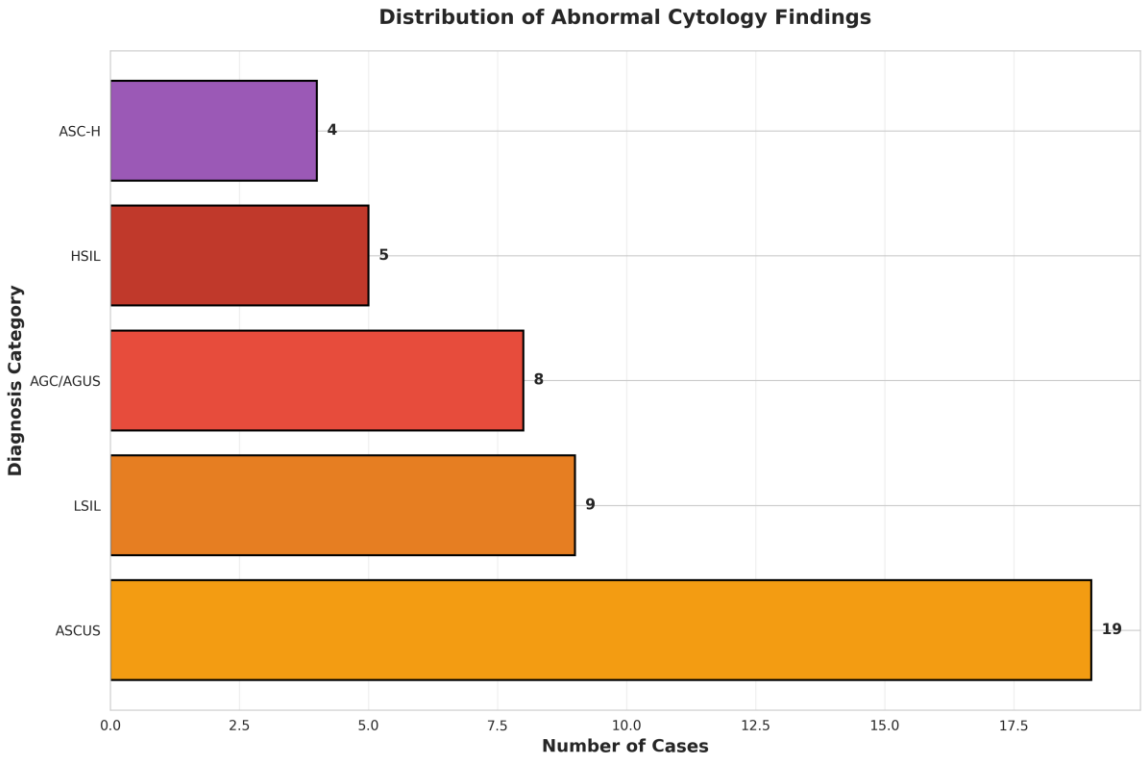

Figure 3: Breakdown of abnormal cytology findings, showing ASCUS as the most common abnormality (n=19).

Figure 4: Box plot comparing age distribution across diagnostic categories showing significantly older age in abnormal cytology groups ($p<0.0001$).

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