



## **The Pattern of Cervical Cytology in Women Attending Various Clinics at a Tertiary Hospital in Anambra Southeast, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Conceived and designed: authors SUM, IO and OJ. Data collected and analyzed by authors SUM, IO and OJ. All the samples were read by authors COU and IVO. Wrote the first manuscript; authors SUM, COU and IVO. Contributed to the writing of the manuscript, agree with the manuscript results and conclusion: authors SUM, COU, IVO, IO and OJ. We jointly developed the structure, arguments, critical revisions and approved the final version of the manuscript.*

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### **ABSTRACT**

**Background:** Cervical cancer is one of the most common female reproductive tract malignancies with high morbidity and mortality most especially in the developing countries. Our purpose of this study is to determine the pattern of cervical smear and also to determine the effect of socio-demographic factors on the pattern of cervical cytology among women attending gynaecological clinic in Nnewi, Southeast Nigeria.

**Materials and Methods:** This cross-sectional prospective study was conducted at Nnamdi Azikwe University Teaching Hospital, (NAUTH), Nnewi, Anambra state, in South East Nigeria from December 2007–July 2008.

**Result:** Ninety six (68.6%) of the women had normal cervical smear while forty one (29.3%) had abnormal cervical smear. The proportion of unsatisfactory smear was 2.1%. The number and rates of abnormal cervical smear was further sub-classified as LSIL (25 cases, 17.9%), HSIL (12 cases, 8.6%), ASC-US (3 cases, 2.1%) and glandular

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intraepithelial lesion (1 case, 0.7%). No case of squamous cell carcinoma was detected.  
**Conclusion:** The study shows that various patterns of abnormal cytology were found among our women and the prevalence of this abnormal smear is high. These findings underscore the need for massive and sustained reproductive health education and establishment of cervical cancer screening centres.

*Keywords: Cervical smear; pattern; cervical cancer; cytology; Pap smear; reproductive health.*

## 1. INTRODUCTION

Cervical cancer still remains the commonest cause of cancer death among women in developing countries [1]. This is largely due to the absence of organised cervical cancer screening programs. The purpose of cervical cancer screening is to reduce the incidence of invasive carcinoma by promptly detecting and treating high grade squamous intraepithelial lesion which is a precursor lesion. There is evidence that the incidence rate of Cervical Intraepithelial Neoplasia (CIN) is increasing in some parts of sub-Saharan Africa [2]. An important reason for the marked higher cervical cancer incidence in developing countries in comparison with developed countries is the lack of effective and organized screening programs. This difference is expected to widen in the next decades when the effect of the widespread vaccination already introduced in industrialized countries which is expected to further reduce cervical cancer incidence is noted. Despite the undisputed and impressive successes which have been achieved by cervical cytology in the fight against cervical cancer and its precursor stages in industrialized countries, yet no routine organized program has been established in Sub-Saharan Africa and most especially in Nigeria where the burden of cervical cancer and mortality associated with the disease is high. In Nigeria and indeed many other parts of Sub-Saharan Africa, cervical carcinoma is the commonest genital cancer in women. In Nnewi, southeast Nigeria, carcinoma of the cervix accounted for 55.64% of all the gynaecological malignancies [3] and also in Zaria, North central Nigeria, carcinoma of the cervix accounted for over 66% of gynaecological malignancies with over 88% presenting at FIGO stage 11b or beyond [4]. Cancer of the cervix is now regarded as a sexually transmitted disease because of its strong association with human papilloma virus (HPV). HPV infection has been recognized as being responsible for more than 70% of the cervical carcinoma worldwide [5]. This study aims to determine the pattern of cervical smear and also to determine the effect of socio-demographic factors in the pattern of cervical cytology among women attending gynaecological clinic in Nnewi, Southeast Nigeria.

## 2. MATERIALS AND METHODS

This cross-sectional prospective study was conducted at Nnamdi Azikwe University Teaching Hospital, (NAUTH), Nnewi, Anambra state, in South East Nigeria from December 2007–July 2008. NAUTH is a tertiary teaching hospital with four (4) out stations located at Ukpo, Oba, Umunya and Nneni. NAUTH is located in Nnewi a town 30km from Awka the state capital city. Nnewi is a semi-urban area and the second largest city in Anambra state. The predominant economic activity of her people is commerce. The study was conducted in the Gynaecology and family planning clinics in NAUTH, Nnewi among sexually exposed women between the ages of 16 and 64 years who attended these clinics during the period of study. The respondents were longitudinally recruited after giving verbal consent to participate in the study. Pre-tested, semi-structured, self administered questionnaires were used to elicit

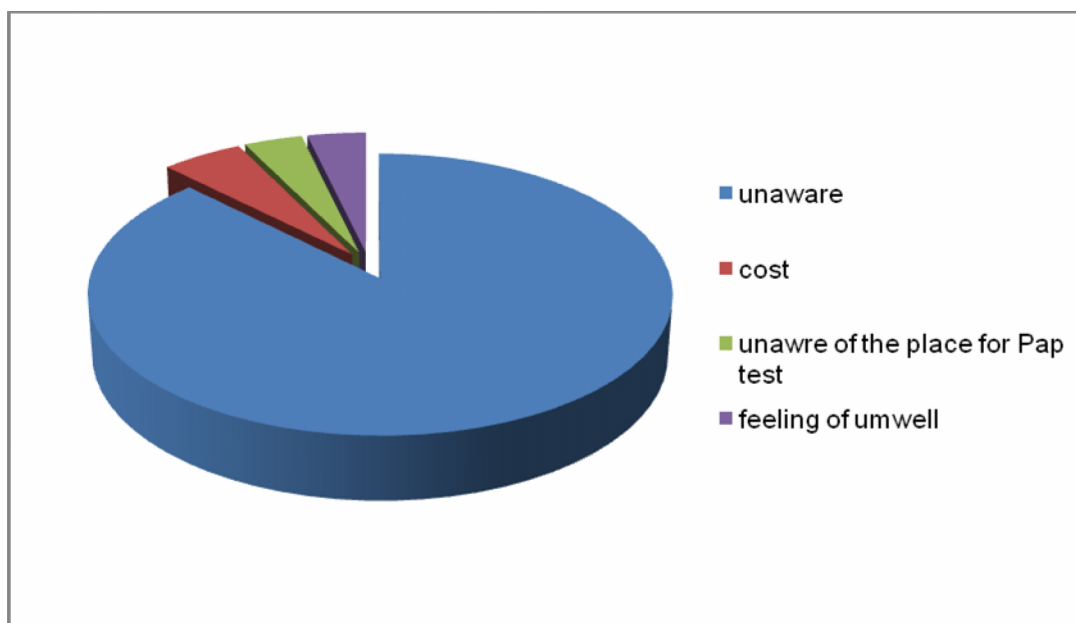
information on the demographic data, knowledge of cervical cancer screening using Pap smear test, utilization and acceptability of the screening test. The women who completed the questionnaires had Pap smear collected from them by the researcher after noting the appearance of cervix, which was reported as: (a) healthy (b) suspicious and (c) abnormal (those with abnormal cervical appearance i.e obvious cervical lesion were excluded from this study).

Each woman was placed in dorsal position with her legs flexed at the hip and knee; and abducted. The labia were parted with gloved thumb and index fingers. A Cusco's bivalve speculum which was not lubricated was then passed and fixed to visualize the cervix under a bright light source. The hook end of the Ayres' spatula was then inserted at the external Os and swept through 360 degrees rotational movement either in clockwise or anticlockwise direction to scrape the entire squamo-columnar junction of the transformation zone. The smears were uniformly spread on two pre-labeled frosted slides and immersed into 95% alcohol for fixation and the dried afterwards. The last question on the questionnaire was answered after the smear has been taken. The smears were stained by the same laboratory scientist using Papanicolaou method and read by a pathologist. Three main stains were used - Harris's haematoxyline without acetic acid, orange G (OG6) and papanicolaou eosin-azure. All the smears were interpreted in accordance with the 2001 Bethesda system of reporting cervical and vaginal cytology [4,5]. The cytology report of the smears therefore read any of the following: Normal, Low grade squamous intraepithelial lesion (LGSIL), High grade squamous intraepithelial lesion (HGSIL), Atypical squamous cell (ASC), Atypical glandular cells of uncertain significance (AGCUS). Ethical approval was obtained from the ethical committee of Nnamdi Azikiwe Teaching hospital Nnewi.

### **3. RESULTS**

A total of 198 women were recruited during this study. Fifty of the women withdrew from the study after completing the questionnaire by refusing cervical smear to be collected from them and 8 women were excluded based on the stated exclusion criteria. The 140 women who participated fully in this study formed the basis of the analysis. The age range of the women was 16–64years with a mean age of 33.8years. The peak age range of the respondents was 25-29years which accounted for 39 (27.9%) of the respondents. About 58% of the respondents were below 35 years of age while 42.0% were above 35years. Two (1.4%) of the women had non-formal education. Twenty one (15.0%) of the women received primary education, 70 (50.0%) received secondary education while 41 (33.6%) of the women received tertiary education. They were mostly married 117 (83.6%) and in monogamous 113 (80.7%) relationship. Polygamy was uncommon 16.4%. Seventy six (54.3%) of the participating women were nulliparous. The parity range was 0–8 with a mean of  $1.2 \pm 1.7$ . The sociodemographic characteristics of the women are as shown in Table 1 while Table 2 depicts the sexual attitudes of the participating women Only 3 (2.1%) of the respondents admitted having been exposed to sexual intercourse before menarche and 60 (42.0%) during the adolescent age. The age range at first sexual exposure was 8-37years with a mean of  $20.3 \pm 5.1$  years while the age range at marriage was 16-45years with a mean of  $25.4 \pm 5.5$  years and a mode of 28years. Despite the pattern of sexual exposure, 63.6% of the women have been sexually exposed for more than ten years. Inconsistent answers were given by the women on their life-time number of sexual partners for which the analysis of this factor was disregarded. Only 18 (12.9%) of the women were aware of cervical cancer screening test while 122 (87.1%) have never heard of the cervical cancer screening test before. Fifteen (83.3%) of those women who were aware of cervical cancer screening test got their information from health care providers, 2 (11.1%) from television and 1 (5.6%) from radio.

However, 11 (61.1%) women out of the 18 respondents who were aware of cervical cancer screening test have done a Pap test before. Six (55.0%) of the women who were aware of cervical cancer screening test have done it once while 5 (45.0%) women have done it twice. The various reasons for not screening are presented in Fig 1. One hundred and nineteen (85.0%) of the women could not screen because they were not aware of the cervical cancer smear screening while 4 (3.2%) consider it an unnecessary exercise. There is a significant association between the educational status and the knowledge of cervical smear Pap test as those with higher educational status were found to be more knowledgeable about cervical smear Pap test than their counterparts with lower educational status. ( $X^2=10.14$ ,  $p$  value=0.001) One hundred and eight (77.1%) of the women did not practice any form of contraception. Table 3 reveals that of the 32 (22.9%) women who did practice contraception 14 (43.8%) women used intra-uterine contraceptive device (IUCD), 11 (37.5%) used combined oral contraceptive pill and 4 (12.5%) used condom. The condoms were all male condoms used by their male sexual partners. The range of the duration of contraceptive use was 6 months to 15 years with a mean of  $1.3 \pm 0.6$  years. Eighty seven (62.1%) of the women were aware of their human immune-deficiency virus (HIV) screening status while 52 (37.1%) were unaware of their HIV status. Of the women who were aware of their HIV status, only 11 (7.9%) were sero-positive while 77 (55.5%) were sero-negative. Fifty two (37.1%) of the women did not give any response to their HIV status. Majority 130 (92.9%) of the women were aware of the existence of sexually transmitted infections and about 67 (47.9%) had suffered from abnormal vaginal discharge in the past. None of the women admitted to have ever smoked in their life time. Eighty (57.1%) of the women agreed that they would like to repeat cervical cancer screening test next time while 60 (42.9%) would decline to further cervical cancer screening test.



**Fig. 1. The various reasons why the women did not do cervical screening.**

Fig. 2 shows the result of the cervical smear test using the 2001 Bethesda classification. Ninety six (68.6%) of the women had normal cervical smear while 41 (29.3%) had abnormal cervical smear. The proportion of unsatisfactory smear was 2.1%. The abnormal cervical

smear was further sub-classified as LSIL (25 cases, 17.9%), HSIL (12 cases, 8.6%), ASC-US (3 cases, 2.1%) and glandular intraepithelial lesion (1 case, 0.7%). No case of squamous cell carcinoma was detected. The peak age prevalence of abnormal cervical smear was 40-44 years. Table 4 shows that among all the factors considered, the parity, and the age were found to be significantly associated with abnormal cervical smear finding. The abnormal cervical smear was found to occur with increasing parity ( $\chi^2=20.46$ ,  $p=0.001$ ) and increasing age ( $\chi^2=15.75$ ,  $p=0.003$ ). There was no association between the age at first intercourse and abnormal cervical smear ( $\chi^2=0.5$ ). Table 5 shows that although there was no significant association between the use of contraception and abnormal cervical smear generally but among the women practicing contraception, abnormal smear occurred only among women who had worn intra-uterine contraceptive device (IUCD).

**Table 1. The Socio-demographic characteristics of the women**

<b>Variable</b>	<b>Frequency N=140</b>	<b>Percent N=100%</b>
<b>Age range (years)</b>		
16-19	1	0.7
20-24	13	9.3
25-29	39	27.9
30-34	28	20.0
35-39	27	19.3
40-44	19	13.6
44-49	8	5.7
50-54	0	0
55-59	0	0
60-64	5	3.6
<b>Educational status</b>		
Non formal	2	1.4
Primary	21	15
Secondary	70	50.0
Tertiary	47	33.6
<b>Marital status</b>		
Single	15	10.7
Married	117	83.6
Divorced	2	1.4
Widow	6	4.3
Separated	0	0
<b>Parity</b>		
Nullipara (para 0)	76	54.3
Primipara (para 1)	24	17.1
Multipara (para 2-4)	32	22.9
Grand multipara (para $\geq$ 4)	8	5.7

**Table 2. The sexual attitude of the women**

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
Age at first sexual exposure	N=140	100
≤9	3	2.1
10-14	6	4.3
15-19	54	38.7
20-24	43	30.7
25-29	17	12.1
30-34	5	3.6
≥ 35	2	1.4
No response	10	7.1
Mean=20.3±5.1 years, Range 9–45 years		
<b>Age at marriage</b>		
15-19	13	9.3
20-24	45	32.1
25-29	41	29.3
30-34	19	13.6
35-39	7	5.0
≥ 40	2	9.3
Not applicable	13	9.3
Mean=25.4±5.5 years Range 16–45 years		
<b>Duration of sexual exposure</b>		
<1-5	22	15.7
6-10	29	20.7
11-15	25	17.9
16-20	30	21.4
21-25	12	8.6
25-30	3	2.1
31-35	3	2.1
≥36	2	1.4
No response	14	10.0
Mean=13.9±8.3 years; Range=<1- 43 years		

**Table 3. The contraceptive methods practiced by the women**

<b>Contraceptive method</b>	<b>Frequency</b>	<b>Percentage</b>
IUCD	14	43.8
Hormones	12	37.5
Condon	6	4.3
Total	32	100.0
<b>Duration of contraceptive use</b>		
<1yr	24	75.0
1-5yrs	6	18.8
6-10yrs	1	3.1
>10yrs	1	3.1
Total	32	100.0

**Table 4. The relationship between the various risk factors and the cervical smear result**

Variable	Cervical finding		X <sup>2</sup>	p-value
	Normal	Abnormal		
Age (years)				
<24	14	0		
25-29	29	9		
30-34	20	8	15.75	
35-39	18	7		0.003*
40-44	6	12		
>45	9	4	df=4	
Total	96	40		
Educational status	N=96	N=41		
Non-formal	16	6	2.85	0.24
Secondary	44	25		
Tertiary	36	10		
Marital status	N=96	N=41		
Single	15	0		
Married	77	37		
Divorced	0	2		
Widow	4	2		
Parity	N=96	40		
Nulliparous	63	10	20.46	0.001*
Primiparous	14	9		
Multiparous	19	21	df=2	
Contraceptive use	N=96	41		
Yes	24	8	0.4	0.525
No	72	33		
Age at first sexual exposure	N=87	N=35		
≤ 19	45	18	0.5	0.4
≥ 20	42	22	OR=1.31	
Duration of sexual exposure	N=85	N=35	X <sup>2</sup>	p- value
≤ 10 years	35	16	0.21	0.648
≥ 11 years	85	19		
HIV status	N=65	N=22		
Positive	8	3		
Negative	57	19	F=0.003	1.0
Vaginal discharge	N=96	N=40		
Yes	43	21	0.91	0.341
No	53	19		
Total	96	40		

Key: \*:Statistically significant, F:Fischers exact, OR:Odds ratio, X<sup>2</sup>:chi square, df: degree of freedom

**Table 5. Cross-tabulation of the type of contraception practiced by the women and result of cervical screening using Bethesda classification**

		Type of contraceptive method used			Total
		IUCD	COC Pill	Condom	
Result of cervical screening test	Normal	7	11	4	22
	LGSIL	5			5
	HGSIL	2			2
Total		14	11	4	29

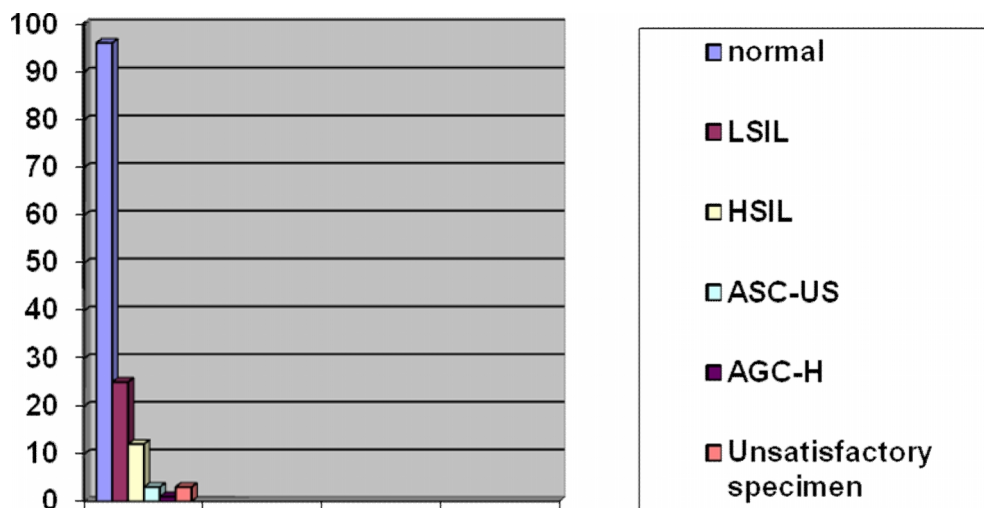


Fig. 2. The result of the cervical smears according to 2001 Bethesda system

#### 4. DISCUSSION

The prevalence rate of abnormal cervical smear of 26.5% is very remarkable. It is significantly higher than 9.5% and 12.2% reported from Ibadan [6] and Enugu respectively [7]. It is also higher than 17.9% reported from Gombe [8] and the world-wide estimation of 10%<sup>9</sup>. Abnormal cervical smear occurred mostly in women above 25 years with age specific peak of 40–44years age range. The finding of significant association between age and the occurrence of abnormal smear with the prevalence of abnormal cervical smear increasing with advancing age is in agreement with the reports of the studies in Enugu [7], Gombe [8] and India [9] and the observations of Di Saia and Creasman [10] although it contrasts sharply with the finding of Lawson et al who reported a sharp decline in the prevalence of abnormal smear with increasing age [11]. The difference could be due to variations in the demographic, sexual, reproductive and sociocultural factors of the populace screened. It may also be due to the lack of well organized screening programme in our environment in contrast to the women in Lawson's series who were active participants in a well organized screening programme. Early detection, evaluation, and treatment of abnormal smears would lead to its declining prevalence with increasing age. The finding in this study of increasing prevalence of abnormal cervical smear increasing with advancing age will however not invalidate the recommendation that where funds are available all women who are sexually active or who have reached age 18 should undergo annual Pap smear test [12]. However it lays credence to the fact that commencing screening at 35 years or above could be cost effective in depressed economy.

The influence of parity in this study is statistically significant. The occurrence of abnormal cervical smear increased with parity. This finding of increasing predisposition to abnormal smear with increasing parity in this study collaborate the observations in other studies [13,14,15]. It may not be the number of parity per se but other confounding factors like number of sexual partners, age at onset of sexual intercourse and their partner's number of other sexual partners. Apart from the significant effects of parity and age on the occurrence



of abnormal cervical smear, the lack of significant effects of marital status, age at onset of sexual intercourse, duration of sexual exposure, educational and HIV status is paradoxical [13,14]. The preponderance of monogamous relationship, delayed onset of coitarche, and late marriage are noteworthy characteristics of the respondents which may protect against vestiges that may lead to the development of abnormal cervical smear. However, it is not improbable that some subjects lied about the time they began coital activity, in order to align to religious and socio-cultural expected values.

The observation in this study of 29% contraceptive use prevalence is higher than the national contraceptive use prevalence in Nigeria reported to be as low as 6% [16]. The commonest contraceptive method used by the women was IUCD. Although no significant association was noted between contraceptive use and the occurrence of abnormal cervical smear, but the HGSIL occurred only among women IUCD users i.e. either current users or those who had ever used IUCD. It is not certain if this association between IUCD use and abnormal smear is causal or incidental. It may be necessary therefore to follow up women wearing IUCD or who had used IUCD with cervical smear test. The association between contraceptive use and the development of abnormal cervical smear is varied. Barrier contraceptives have been shown to lower the incidence of abnormal cervical smear while other methods like injectable contraceptives and IUCD have been associated with increased incidence of abnormal cervical smear [17]. The presence of vaginal discharge had no statistically significant influence on the occurrence of abnormal cervical smear.

The high prevalence of abnormal vaginal discharge among our respondents should be of great concern. This may suggest increased risk of pelvic inflammatory disease (PID), preponderance of sexually transmitted diseases and may also have compounded with other factors to cause the high prevalence of abnormal smear among the participating women.

Tobacco smoking has been regarded as a cause of cervical cancer. Tobacco smokers both current and past users have been reported to have increased risk of squamous cell cancer of the cervix compared to non smokers [18]. Interestingly tobacco smoking is rare among our women. This may be due to religious and socio-cultural negative perception of smoking by our women. It may also show that the campaign against smoking is effective.

The finding of low awareness of cervical cancer, Pap smear test and utilization of cervical cancer screening service in this study corroborates with established data in Nigeria [19,15,20].

There is a high prevalence of abnormal cervical smear among the women above the age of 35 years in this study. Also there is low incidence of opportunistic screening, low level of awareness, compliance and acceptability of the cervical smear test among the women. It is worthy to note that this is a hospital based study and may not be representative of the general population. There is the need for massive and sustained reproductive health education and establishment of routine cervical cancer screening centres.

#### **4. CONCLUSION**

The study shows that various patterns of abnormal cytology were found among our women and the prevalence of this abnormal smear is high. These findings underscore the need for massive and sustained reproductive health education and establishment of routine cervical cancer screening centres.

## **CONSENT**

The women who participated in this study gave their informed consent. They were variously counselled by the researchers and their consents were obtained before they were enrolled in the study. Moreover, they were extensively counselled at every stage of the research.

## **ETHICAL APPROVAL**

Ethical approval was obtained from the hospital's ethical committee before the commencement of the study. The study was performed in accordance with ethical standards laid down in the "1964 declaration of Helsinki".

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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