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■ Original Research Article

Pattern of Cervical Cytology in a Tertiary Health Care Centre in Abuja – The Capital City of Nigeria

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ABSTRACT

Background: Cervical cancer is a preventable disease. Its incidence and mortality have reduced drastically in countries with well-established cervical cancer screening programmes. **Objectives:** To determine the pattern of cervical cytology and associated risk factors in women routinely screened at the Federal Medical Centre Abuja. **Methodology:** This was a cross-sectional study conducted from September 2018 to September 2019. An equal number of 270 women each were recruited from the postnatal, family-planning and gynaecological clinics giving a total of 810 women enrolled in the study. Informed consents were obtained from the participants and data on risk assessment was collected using an interviewer administered structured questionnaire. Afterwards, a cervical sample was taken from each participant's transformation zone (liquid-based cytology), and results were reported using the Bethesda classification. The data was analysed and presented as tables of frequencies/percentages and central tendencies. The risk factors for cervical dysplasis were determined using multiple logistic regression analysis. Statistical significance was set at p-value < 0.05. **Results:** Overall, the prevalence of abnormal/dysplastic smears was 3.95% while 96.05% had negative smears for intraepithelial lesion or malignancy (NILM). According to the severity of dysplasia, ASCUS had prevalence of 2.96%, ASC-H 0.37%, LSIL 0.37% and HSIL 0.25%. Group specific prevalence was highest among the postnatal group (6.3%). Age was the only factor associated with increased likelihood of developing dysplasia. **Conclusions:** The prevalence of cervical dysplacia is relatively low in Federal Medical Centre Abuja. Instituting routine screening of all sexually active women at every opportunity especially in postnatal clinics be encouraged as this will help in early detection of cervical dysplasia and management, thus reducing the incidence of cervical cancer.

Keywords: cervical dysplasia, screening, sexually active women, pap smear, Bethesda classification

INTRODUCTION

Cervical cancer, globally, is the 4th most common cancer in women in both incidence and mortality.[1,2] The burden has progressively reduced in most developed countries with well-established cervical cancer screening and management programmes[2] The high burden of the disease in developing economies of the world such as Nigeria, where it ranked 2nd in women, has been linked to lack of national policies on effective cytological screening and treatment, poverty and high rates of unawareness[3].

Cervical cancer is a highly preventable malignancy preceded by precursor lesions that are treatable and are generally referred to as cervical dysplasia or cervical intraepithelial neoplasia when suspected by cytology or diagnosed by histology respectively[4]. Cervical dysplasia has a variable prevalence depending on the socio-economic characteristics and geographical areas of the population being studied. It can be as low as 1.05% and as high as 13.7% in family planning clinics and sexually transmitted disease clinics respectively[5]. A prevalence rate of 19.8% was reported in Sokoto, a state located in the Northwestern region of Nigeria[5], 13.9% reported in a primary care clinic by Mosuro et al in Ibadan, South west Nigeria[6] and 16.2% recorded in Benin by Obaseki and Nwafor[7].

The human papilloma virus (HPV) has been implicated in the aetiology of Cervical intraepithelial neoplasia (CIN) and cervical cancer and it is sexually transmitted to susceptible women. Other risk factors that may enhance the oncogenic potential of HPV include multiple sexual partners; high parity, smoking and immunosuppression[4, 8-9].

Cervical cytology using the conventional Papanicolaou (Pap) smear test and Liquid - based cytology, as well as Human papillomavirus (HPV) testing and colposcopy are the major screening methods used worldwide.[9-12] Pap smear testing has been a key factor in the global strategy for reducing cancers with evidence showing its effectiveness in reducing the incidence and mortality associated with cervical cancer in developed regions of the world with national routine screening programs[13,14]. This unparalleled success in cancer prevention was most importantly due to the partnership between cervical cytology screening and treatment of colposcopically detected high grade dysplasia[2]. In Nigeria, and other countries in sub-Saharan Africa that lack structured screening programmes, the incidence is still high. Cytological findings are reported using the Bethesda system which was developed as a uniform system of terminology with the aim of providing guidance on clinical management[14-16].

Recent epidemiological studies on the incidence and prevalence of these premalignant cervical lesions are few in our environment and none documented in Federal Medical Centre Abuja-the second largest tertiary care centre within the metropolis of the Nigerian capital city. This study was designed to determine the pattern of cervical cytology amongst women that were referred to the cervical cancer screening clinic from other clinics within and outside the hospital.

MATERIALS AND METHODS

Study Designs and Setting

This was a cross-sectional study carried out at the Cervical Cancer Screening Clinic, a section of the Gynecologic Oncology Unit of the Obstetrics and Gynaecology Department of the Federal Medical Centre Abuja (FMC Abuja). FMC Abuja is one of the main referral tertiary hospitals with a functional Cervical Cancer Screening, Colposcopy and modern treatment facility (for CIN) in Abuja. Federal Capital Territory (FCT) has an estimated population of over 3 million comprising different ethnic groups [17]. FCT is located in the North Central region of the nation and bounded by states including Nassarawa, Kogi, Kaduna and Niger[18]. This Cervical Cancer Screening Clinic receives patients from postnatal, family planning, gynaecological and general outpatient clinics within the hospital and referrals from other hospitals. Since inception in 2015, the clinic screens on an annual basis about 1000 – 2500 women.

Study Population

This included consenting non-pregnant, sexually active women aged 25 to 65 years who came for routine cervical screening or referred from any clinic/hospital to the Cervical Cancer Screening clinic. Women who were currently pregnant, had previous total hysterectomy, had cervical cancer and had not given consent were excluded from the study.

Sample Size Estimation

The sample size was calculated using the following formula $N = Z^2 P (1-P)/D^2$ [19]. Where, N is the minimum sample size, P is the prevalence value, D is the absolute precision of the study which is 0.05. and Z is the area under normal curve corresponding to 95% confidence interval = 1.96. Using 19.8% prevalence of cervical dysplasia in a previous study done amongst women who were attending the Family Planning and Gynaecology clinics in Usman Dan-Fodio University Teaching Hospital Sokoto [5]. Using a 10% non-response rate, we calculated a sample size of 810, which was then

distributed equally amongst the three study groups (postnatal, family-planning and gynaecological clinics).

Study Procedure and DATA Collection

All women who met the eligibility criteria and gave written informed consent were recruited by consecutive sampling technique over a period of one year from 18th September 2018 to 17th September 2019. A structured questionnaire was administered by the investigator and a trained assistant to obtain participants' personal information. They were properly informed about the purpose of the study and a written consent was obtained. The questionnaire included information on socio demographic characteristics, smoking, age at first sexual intercourse, sexual habits of the woman and her spouse, lifetime use of contraceptives and previous papanicolaou smear result.

Sample Collection

All pelvic examinations were performed by either a Consultant Gynaecologist or a Resident doctor in the department of Obstetrics and Gynaecology. The participant was placed in the lithotomy position and a sterile Cusco's speculum was used to expose the cervix. Following visual inspection with a good light source, the cervix was assessed for gross lesions and abnormal discharge. Cervical sample was collected with a disposable cervical broom from the transformation zone and the broom detached into the pre-labeled preservative solution (liquid-based). The samples were transferred to the Pathology laboratory for cytology (Votex method) [20] and reporting. Bethesda system of reporting was employed[15].

Statistical Analysis

Data coding, entry, cleaning, and analysis were done using Epi Info™ version 7.2.2.6 2018 [21]. Results were presented in tabular format and charts. Categorical variables were presented as frequencies and proportions and Chi Square test was used to test for associations between the outcome variables (presence or absence of cervical dysplasia) and independent risk factors at bivariate level of analysis. Multivariate analysis using Logistic regression was done to identify the significant predictors of cervical dysplasia and presented as odds ratio with 95% confidence interval. Statistical significance was set at p value < 0.05.

Ethical Considerations

Ethical approval was obtained from the Federal Medical Centre Jabi Health Research and Ethics Committee according to the declaration of Helsinki [22]. All participants were counselled prior to enrolment and signed an informed consent form. The investigators ensured strict confidentiality of participants information.

RESULTS

Socio-Demographic Characteristic of the Study Population

The overall mean age was 36.2 $\pm$ 8.7years. A greater proportion of the women who were referred from the gynaecological (gynae) clinic to the screening clinic were in the older age group (>45years) compared to the those referred from family planning or postnatal clinics. Likewise, the median parity differed significantly among the groups. Fewer grand-multiparous women were in the postnatal compared to either the family planning group or the gynae-referred counterparts. Overall, majority of the respondents had low parity and only nineteen percent had high parity (**≥4**). Majority (88.8%) had tertiary education, were currently married (89.8%), in monogamous setting (92.01%), were Christian (85.5%), and were civil servants (60.56%). See Table 1.

Of the 810 women studied 32 participants had Epithelial squamous cell abnormality; a prevalence rate of 3.95% for cervical dysplasia as shown in figure 1.
Further analysis of the types/patterns of epithelial squamous cell abnormality showed that atypical squamous cell of undetermined significance (ASCUS) was the most prevalent. Out of the 32 persons with abnormal cytology results 24 (75%) had ASCUS but overall, the prevalence of ASCUS was 2.96%, three (0.37%) had atypical squamous cell - high grade lesion not excluded (ASC-H), three (0.37%) Low grade squamous intraepithelial lesion (LSIL), and two (0.25%) High grade squamous intra-epithelial lesion (HSIL) as shown in figure 2.

Cervical Dysplasia Distribution Among Postnatal, Family Planning and Other Routine Groups

The specific prevalence of epithelial cell abnormality among each group was sought as shown in Table 2

Table 1: Socio-demographic Characteristics

Variables	Groups RG n=270(%)	PN n=270(%)	FP n=270(%)	Total N=810(%)	χ^2	df	p
Age group					319.3	4	0.001
25-34	62 (23.0)	207 (76.7)	171 (63.3)	440(54.4)			
35-44	75(27.8)	58(21.5)	95 (35.2)	228 (28.2)			
>45	133(49.3)	5 (1.9)	4 (1.5)	142 (17.5)			
Mean Age ± SD	*43.7± 9. 9*	*31.7 ±4.7*	*33.2± 4.9*	*36.2±8.7*			
Parity					203.8	4	0.001
0-1	113 (41.9)	178(65.9)	26 (5.6)	317(39.1)			
2-3	90(33.3)	85 (31.5)	164(60.74	339(41.85)			
≥4	67 (24.81)	7 (2.6)	80 (29.63)	154(19.01)			
Median (IQR)	*2(1-3)*	*1(1-2)*	*3(2-4)*	*2(1-3.5)*			
Education level					3.44	2	0.179
≤ Secondary	25(9.3)	28(10.4)	38(14.1)	91(11.2)			
Post-secondary	245(90.7)	242(89.6)	232(85.9)	719(88.8)			
Marital status					43.52	2	0.001
Married	216(80.0)	260(96.3)	251(93.0)	727(89.8)			
Not married	54(20.0)	10(3.7)	19(7.0)	83(10.2)			
Religion					1.41	2	0.493
Christianity	226(83.7)	234(87.3)	229(85.4)	689(85.5)			
Islam	44(16.3)	34(12.7)	39(14.6)	117(14.5)			
Occupation					12.50	6	0.052
Unemployed	25(9.4)	27(10.4)	34(13.0)	86(10.9)			
Self-Employed	53(19.9)	80(30.9)	69(26.4)	202(25.7)			
Civil Servant	182(68.4)	144(55.6)	150(57.5)	476(60.6)			
Professional	6(2.3)	8(3.1)	8(3.1)	22(2.8)			
Smoking					1.99	2	0.999
No	269(100.0)	269(99.6)	269(100.0)	807(99.9)			
Yes	0(0.0)	1(0.4)	0(0.0)	1(0.1)			
Alcohol					2.88	2	0.236
No	194(72.9)	210(78.1)	209(78.6)	613(76.5)			
Yes	72(27.1)	59(21.9)	57(21.4)	188(23.5)			
Comorbidity					2.15	2	0.340
Yes	45(16.7)	33(12.2)	39(14.4)	117(14.4)			
No	225(83.3)	237(87.8)	231(85.6)	693(85.6)			
Supplement					4.89	2	0.086
No	194(73.8)	212(81.2)	207(79.9)	613(78.3)			
Yes	69(26.2)	49(18.8)	52(20.1)	170(21.7)			
Family History					1.25	2	0.534
No	247(92.5)	251(94.7)	247(94.3)	745(93.8)			
Yes	20(7.5)	14(5.3)	15(5.7)	49(6.2)			
Age at first delivery					50.56	4	0.001
<19	3(1.4)	2(0.8)	2(0.7)	7(0.9)			
20-29	154(73.7)	163(61.3)	234(87.6)	551(74.3)			
>=30	52(24.9)	101(38.0)	31(11.6)	184(24.8)			
Sexual partners					3.71	2	0.156
1.00	111(41.3)	128(47.4)	132(48.9)	371(45.9)			
≥2.00	158(58.7)	142(52.6)	138(51.1)	438(54.1)			
Coitarche					35.10	4	0.001
<19	103(38.1)	51(18.9)	71(26.3)	225(27.8)			
20-29	153(56.7)	200(74.1)	195(72.2)	548(67.7)			
≥30	14(5.2)	19(7.0)	4(1.5)	37(4.6)			
Contraceptive use					6.91	2	0.032
No	248(92.9)	253(94.1)	238(88.1)	739(91.7)			
Yes	19(7.1)	16(5.9)	32(11.9)	67(8.3)			

PN - postnatal, FP - family planning, RG - routine guide, SD = standard deviation, IQR = interquartile range, DF = degree of freedom.

The prevalence of cervical dysplasia among the 270 postnatal women was 6.3%. ASCUS type was the most prevalent form of cervical dysplasia observed in 15 (88.2%) out of the 17 cervical dysplasia reported in this group. For the remaining two participants in the group, one person had ASC-H and the other had LSIL type of cervical dysplasia. There was no HSIL in this group. In the Family planning group, only three (1.11%) women developed cervical dysplasia and all of them developed the ASCUS form.

Among the 270 other women for routine gynaecological check, the prevalence of cervical dysplasia was 4.44% (12). The prevalence of ASCUS, ASC-H, LSIL and HSIL were 2.2% (6), 0.7% (2), 0.7% (2) and 0.7% (2) respectively for this group. The two cases of HSIL reported in the studied population were found among this subgroup. Similarly, two out of the three (66.7%) of LSIL from the studied population were found in this group.

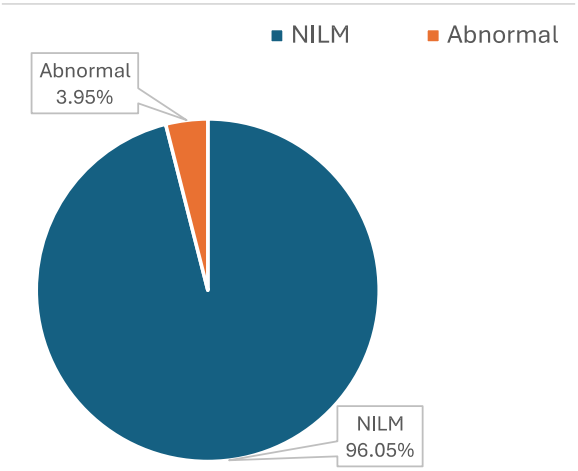

Fig 1: cytological results of the studied population

Cytological Finding Distribution Among the Study Group

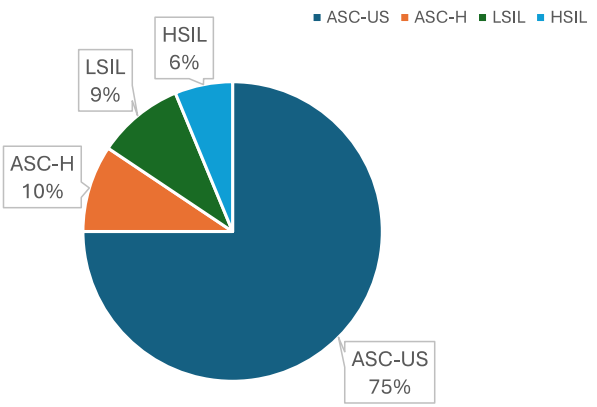

Fig 2: cytological type of the epithelial squamous cell abnormality in studied population

Risk Factors That Modulate the Oncogenic Effect Of HPV

The risk factors (advanced age, high parity, low level of education, low socio-economic status, multiple sexual partners, early age at coitarche, early age at first delivery, OCP use, smoking, marital status, married type, co-morbidities, family history of cancers and alcohol use) which modulate the oncogenic potential of human papillomavirus with its subsequent persistence and progression was sought as shown in Table 3. It was found that age was the only risk factor that was significantly associated with cervical dysplasia (p-value of 0.019).

Table 2: Distribution of Cytological findings among the 3 Groups

Variables	Groups RG n=270(%)	PN n=270(%)	FP n=270(%)	Total N=810(%)	χ^2	df	p
Smear result					9.82	3	0.007
Abnormal	12(4.4)	17(6.3)	3(1.1)	32(3.95)			
NILM	258(95.6)	253(93.7)	267(98.9)	778(96.05)			
	Epithelial Cell Abnormality						
ASC-US	6(2.2)	15(5.6)	3(1.1)	24(2.9)			
95% CI	*0.9 – 4.5*	*3.2 – 8.7*	*0.3 – 2.9*	*1.9 - 4.3*			
ASC-H	2(0.7)	1(0.4)	0(0)	3(0.3)			
95% CI	*0.1 – 2.3*	*0 – 1.7*		*0.1 – 0.9*			
LSIL	2(0.7)	1(0.4)	0(0)	3(0.3)			
95% CI	*0.1 – 2.3*	*0 – 1.7*		*0.1 – 0.9*			
HSIL	2(0.7)	0(0)	0(0)	2(0.2)			
95% CI	*0.1 – 2.3*			*0 – 0.7*			
Total	**12(4.4)**	**17(6.3)**	**3(0.1)**	**32(3.9)**			
95% CI	***2.4 – 7.4***	***3.8 – 9.6***	***0.3 – 2.9***	***2.7 – 5.4***			

The prevalence rate of NILM and epithelial cell abnormality in general population and in various categories

Table 3: Relationship between cytology result and Cofactors

	Dysplasia					NILM	χ^2	p*
	ASC-US	*ASC-H*	*LSIL*	*HSIL*	*Sum total*			
Age group							7.94	0.019
25-34	10(2.3)	0(0.0)	1(0.2)	0(0.0)	11(2.5)	429(97.5)		
35-44	9(3.9)	1(0.4)	0(0.0)	0(0.0)	10(4.4)	218(95.6)		
>45	5(3.5)	2(1.4)	2(1.4)	2(1.4)	11(7.7)	131(92.3)		
Parity							5.11	0.078
0-1	7(2.2)	2(0.6)	0(0.0)	1(0.3)	10(3.2)	307(96.8)		
2-3	9(2.7)	0(0.0)	2(0.6)	0(0.0)	11(3.2)	328(96.8)		
≥4	8(5.2)	1(0.6)	1(0.6)	1(0.6)	11(7.1)	143(92.9)		
Marital Status							0.18	0.668
Currently Married	23(3.2)	2(0.3)	2(0.3)	1(0.1)	28(3.9)	699(96.1)		
Not married	1(2.3)	1(0.0)	1(0.0)	1(2.3)	4(4.8)	79(95.2)		
Family type							1.38	0.280
Monogamous	20(2.9)	2(0.3)	2(0.3)	1(0.1)	25(3.6)	666(96.4)		
Polygamous	3(5.0)	0(0.0)	1(1.7)	0(0.0)	4(6.7)	56(93.3)		
Highest Educational Level							0.05	0.775
≤Secondary	2(2.2)	1(1.1)	1(1.1)	0(0.0)	4(4.4)	87(95.6)		
Tertiary	22(3.1)	2(0.3)	2(0.3)	2(0.3)	28(3.9)	691(96.1)		
Coitarche							3.83	0.176
<19	7(3.1)	2(0.9)	3(1.3)	1(0.4)	13(5.8)	212(94.2)		
20-29	17(3.1)	1(0.2)	0(0.0)	1(0.2)	19(3.5)	529(96.5)		
≥30	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	37(100.0)		
Lifetime Sexual Partners							1.90	0.597
1.00	10(2.7)	2(0.5)	0(0.0)	1(0.3)	13(3.5)	358(96.5)		
≥2.00	14(3.2)	1(0.2)	3(0.7)	1(0.2)	19(4.3)	420(94.8)		
Age at first delivery							2.94	0.164
<19	0(0.0)	0(0.0)	0(0.0)	1(14.3	1(14.3)	6(85.7)		
20-29	21(3.8)	1(0.2)	3(0.5)	0(0.0)	25(4.5)	526(95.5)		
>=30	3(1.6)	2(1.1)	0(0.0)	0(0.0)	5(2.7)	179(97.3)		
Ever used OCP							0.07	0.338
Yes	3(4.5)	0(0.0)	1(1.5)	0(0.0)	4(6.0)	63(94.0)		
No	21(2.8)	3(0.4)	2(0.3)	2(0.3)	28(3.8)	695(93.9)		
Alcohol							0.04	0.775
Yes	6(3.2)	1(0.5)	1(0.5)	0(0.0)	8(4.3)	180(95.7)		
No	18(2.9)	2(0.3)	2(0.3)	2(0.3)	24(3.9)	589(96.1)		
Comorbidity							0.10	0.999
Yes	4(3.4)	0(0.0)	0(0.0)	0(0.0)	4(3.4)	113(96.6)		
No	20(2.9)	3(0.4)	3(0.4)	2(0.3)	28(4.0)	665(96.0)		
Supplement use							2.89	0.089
Yes	7(4.1)	1(0.6)	1(0.6)	1(0.6)	10(5.9)	156(91.8)		
No	14(2.3)	2(0.3)	2(0.3)	1(0.2)	19(3.1)	580(94.6)		
Family history of Cancer							0.00	0.999
Yes	2(4.1)	0(0.0)	0(0.0)	0(0.0)	2(4.1)	47(53.9)		
No	22(3.0)	3(0.4)	3(0.4)	2(0.3)	30(4.0)	715(96.0)		
Occupation							3.37	0.260
Unemployed	1(1.2)	1(1.2)	0(0.0)	0(0.0)	2(2.3)	84(97.7)		
Self-employ	7(3.5)	0(0.0)	3(1.5)	1(0.5)	11(5.4)	191(94.6)		
Civil Servant	14(2.9)	2(0.4)	0(0.0)	1(0.2)	17(3.6)	459(96.4)		
Professional	2(9.1)	0(0.0)	0(0.0)	0(0.0)	2(9.1)	20(90.9)		
Socioeconomic status							9.27	0.090
Upper	23(3.3)	1(0.1)	3(0.4)	2(0.3)	29(4.2)	654(95.7)		
Low /middle	1 (0.7)	2 (1.5)	0(0.0)	0(0.0)	3 (2.4)	124(97.6)		

**fishers exact p values*

However, other known risk factors from previous literature were not significantly associated with cervical dysplasia in this study: high parity (p=0.055), multiple sexual partner (p=0.544), polygamous family type (p=0.280), OCP use (0.787), early coitarche (p=0.176), low level of education (p=0.817), marital status (p=0.668), early age at first delivery (p=0.164), smoking (p=0.999), alcohol use (p=0.858), co-morbidities (p=0.999), family history of cancer (0.999) and lack of multivitamin supplementation (p=0.238). See Table 4

The prevalence of cervical dysplasia rose with increasing maternal age. The prevalence rose from 2.5% to 4.4% and to 7.7% for 25-34, 35-44 and ≥45 age group respectively. Age >45 years were found to have highest numbers of ASC-H (66.7%), LSIL (66.7%) and HSIL (100%), while age 25-34 had highest number of ASCUS (41.7%). Also, the distribution of cervical dysplasia among all the parity groups showed some increase towards higher parity (para- 0-1, 2-3 & ≥4 have 3.2%, 3.2% and 7.1% respectively).

Furthermore, post-secondary level of education has 87.5% of cervical dysplasia with ASCUS (91.7%), ASC-H (66.7%), LSIL (66.7%) and HSIL (100%). Upper 1 & 2 socio-economic level have 93.7% of cervical dysplasia including all of LSIL and HSIL while lower middle class 3 had 6.25% of cervical dysplasia. Those with multiple sexual partners (>2) had 31.2% of cervical dysplasia (with LSIL 66.7% and HSIL 50%), whereas those with single partners had 68.75% of cervical dysplasia (with about 75% being ASCUS). For marital status, those who were married contributed 87.5% of cervical dysplasia, with those in monogamous setting having 86.21% of dysplasia. Early age at first delivery (<19 years) contributed 3.23% of cervical dysplasia while ages 20-29 years had 80.65%. Early age at coitarche contributed 40.63%% of cervical dysplasia (with 100% LSIL and 50% HSIL) while ages between 20-29 has 59.38% and above 30 years 0.0%. Those not using OCP had 96.9% of cervical dysplasia (all ASC-H, LSIL & HSIL inclusive), while OCP use contributed 3.1% of dysplasia (only ASCUS). Almost all of them (99.9%) were non-smokers with 100% of cervical dysplasia. Also, cervical dysplasia was seen in majority of those who did not drink alcoholic beverages (75%) and only in 25% of those that drank alcoholic beverages. Those that did not use multivitamin had 64.5% of dysplasia (including 66, 7%.for ASCUS, ASC-H, LSIL respectively and 50% for HSIL).

Analysis of the socio-economic class using Kuppuswamy's Socio-economic Status Scale [23] showed most patients (86.2%) fell into upper and upper middle class, with few (13.8%) in lower middle class.

Table 4: Multinomial logistic regression

	Dysplasia	No dysplasia	OR (95% CI)	p	AOR (95% CI)	p
Age group						
≥45	11(7.7)	131(92.3)	3.27(1.39-7.73)	0.007	2.91(1.14-7.40)	0.025
35 -44	10(4.4)	218(95.6)	1.79(0.75-4.28)	0.191	1.59(0.64-3.96)	0.318
25 -34 (ref)	11(2.5)	429(97.5)	1			
Parity						
≥4	11(7.1)	143(92.9)	2.36(0.98-5.69)	0.055	1.73(0.66-4.57)	0.265
2-3	11(3.2)	328(96.8)	1.03(0.43-2.46)	0.948	0.91(0.37-2.23)	0.833
0-1 (ref)	10(3.2)	307(96.8)				
Currently married						
Married	28(3.9)	699(96.1)	0.79(0.26-3.18)	0.668	1.21(0.40-3.66)	0.739
Not married	4(4.8)	79(95.2)				
Educational level						
≤ Secondary	4(4.4)	87(95.6)	1.13(0.28-3.35)	0.817	1.03(0.35-3.07)	0.958
Tertiary	28(3.9)	691(96.1)				
Sexual partners						
≥2	19(4.3)	419(95.7)	1.24(0.27-2.79)	0.544	1.24(0.59-2.58)	0.568
1(ref)	13(3.5)	358(96.5)				
Ever used contraceptives						
Yes	10(4.3)	221(95.7)	1.11(0.46-2.49)	0.787	1.12(0.51-2.44)	0.781
No (ref)	22(3.9)	540(96.1)				
Alcohol					1.10 (0.48-2.54)	0.825
Yes	8(4.3)	180(95.7)	1.09(0.41-2.56)	0.858		
No (ref)	24(3.9)	589(96.1)				
Comorbidity present						
Yes	4(3.4)	113(96.6)	0.84(0.21-2.46)	0.999	1.07(0.13-8.73)	0.953
No(ref)	28(4.0)	665(96.0)				

a. The reference category is: NILM for pap smear results. Ref = reference category for the predictors, AO= adjusted odds ratio, CI = confidence interval

DISCUSSION

Our study showed that epithelial cell abnormality occurred in 32 participants giving rise to a prevalence rate of 3.95%. Although similar to the 3.23% obtained by Gupta el al in Western Uttar Pradish, India [24] the prevalence was however lower than the 7% obtained in a similar study done by Nnadi et al [25] in Sokoto and 7% reported by Avidime et al [26] in Zaria, both cities in Northwestern Nigeria. In UCH Ibadan, Southwestern Nigeria, a prevalence of 13.9% was reported in a primary care clinic by Mosuro et al [6] and much higher prevalence of 16.2% was recorded in Benin by Obaseki and Nwafor.[7] These figures were much higher than that reported in our study. The probable reason for the low prevalence in our study might be because most of these studies used the conventional pap smear method, whereas we used liquid based cytology which gives better clarity and more accurate interpretation especially for haemorrhagic and inflammatory smears. Also, majority of the participants in our study were below age 36 years, of low parity, had post-secondary level of education and were of upper-middle to upper-upper socio-economic class using the modified Kuppuswamy scale[23]. The relatively higher socio-economic status of the participants in this study might have been responsible for the lower prevalence and this was in consonance with fact that cervical cancer, has an inverse relationship with socio-economic status [24].

Atypical squamous cells of undetermined significance (ASCUS) was the commonest epithelial cell abnormality found in this study with a prevalence of 2.96%. This was in consonance with existing reports of ASC-US being the most common form of cervical abnormality as reported by cytology laboratories [27], but differed from the study by Gupta et al [24] which had LSIL and that of Yakassai [28] which had HSIL as the majority. The probable reason might be the difference in the socio-demographic status and type of study. This prevalence for ASCUS was much lower than 11.8% found by Magaji et al [29] in Kaduna but similar to the 2.9% by Mosuro et al in UCH Ibadan [6], and higher than 1.6% by Avidime et al [26] in Zaria.

Mild dysplasia (LSIL) constituted 0.37% prevalence rate, which was lower than 1.36% by Guptal et al [24] and 11.8% from the study by Mosuro et al at UCH Ibadan.[6] The probable reason for this might be the difference in socio-demographic status and screening methods used. Atypical squamous cells not exclude high grade lesion (ASC-H) had prevalence rate of 0.37% which was higher than the 0.04% found by Wang et al in Chinese women[30]. The prevalence rate for high grade squamous lesion (HSIL) was 0.25% and was lower than 0.91% from Guptal et al [24] study and 2.3% by Avidmine in Zaria[26].

Majority of the women with Cervical Dysplasia (53.2%) were found in the post-natal group. Most of these postnatal women had ASCUS component while there were no patients with HSIL. Further analysis of cervical dysplasia among the postnatal women only showed a prevalence rate of 6.3% which was higher than 3% obtained by Ago et al amongst post-natal clinic attendees at the university of Calabar Teaching Hospital [31] and the 4.9% reported by Weiss et al at University of Arizona College of Medicine, Tucson [32] and hence may help in further justifying routine post-natal screening. The probable reason why postnatal women had majority of cervical dysplasis might be because they were younger and sexually active and at risk of sexually transmitted infection. Also, the hormonal effect of pregnancy on the HPV activation and progression might also contribute to this [33].

Specific prevalence of cervical dysplasia among family planning group was 1.11% with ASCUS component only. This was markedly lower than the

prevalence of 12.0% found by Ayinde et al. in UCH among family planning women [34].

Women that came for routine screening from the gynaecological clinics contributed the least to cervical dysplasia prevalence of the study population, but had more of ASC-H, LSIL and HSIL components. However, the specific cervical dysplasia prevalence among these other women was 4.44%. This was higher than the 3.2% by Gupta et al [24]. Most of these women were of advanced age and of high parity which may have contributed to a higher-grade lesion.

The only statistically significant risk/co-factors associated with cervical dysplasia in this study was advanced age (p=0.007). This was in agreement with many studies[34-37]. On the other hand, high parity, multiple sexual partners, polygamous family type, OCP use, early coitarche, low level of education, married status, early age at first delivery, smoking, alcohol use, co-morbidities, family history of cancer and non-use of multivitamin had some associations that were not statistically significant for cervical dysplasia as documented in literature [36- 38]. Smoking was not associated with cervical dysplasia in this study due to the insignificant number of smokers. Many studies found smoking to be a significant risk factor [31, 38].

The risk of cervical dysplasia increases with advancing maternal age with age-group ≥45 years having a higher rate and also had the highest number of ASC-H, LSIL and HSIL, while age 25-34 had the highest number of ASCUS. This was in agreement with many documented studies that found higher prevalence in older women[6, 25, 32].

Also, the distribution of cervical dysplasia among all the parity groups showed some increase towards higher parity of ≥4. This was in agreement with many studies that found a linear trend in the association between parity and risk of developing cervical dysplasia[37, 38], but differed from the study by Monsuro et al [6] which did not find any association with high parity.
The limitation of this study was that it was a hospital-based study and may not be representative of the general population. However, it provides a vista into what might be the pattern of cervical cytology in Abuja and further studies can build on this.

Conclusion/recommendation: This study found a prevalence rate of 3.95% for cervical dysplasia, with ASCUS being the commonest abnormality in FMC Abuja. Majority of the participants in the post-natal group contributed highest to this prevalence signalling the need for screening of women during this period. There was also a linear trend in association between cervical dysplasia, advancing maternal age and high parity.

This study showed that there is need to intensify campaign on routine cervical cancer screening and treatment programmes among all sexually active women within 25 to 65 years in FCT. It is also pertinent for the government to establish a structured national screening programmes and offer free or affordable services in all public hospitals, in order to achieve the WHO 90 -70 - 90 target aiming to eliminate cervical cancer by 2030. All women and their girls in FCT should be encouraged through awareness programmes or by invitation or during hospital appointments, to key into the cervical cancer elimination programmes provided by the Federal government, non-governmental agencies and some public hospitals.

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