

Original Research Article

## Pap Smear Pattern of Women Attending Family Planning Clinic in a Tertiary Healthcare Facility in Nnewi, Anambra State-Nigeria

Samuel Ifedioranma Ogenyi<sup>1</sup>, Harmony Obianuju Ndubisi<sup>2</sup>, Anthony Ajuluchukwu Ngokere<sup>3</sup>, Anulika Obianuju Onyemelukwe<sup>4</sup>, Tobias Peter Pwajok Choji<sup>5</sup>, Rebecca Chinyere Chukwuanukwu<sup>6</sup>, Chizoba Okechukwu Okeke<sup>7</sup>, Jude Ogechukwu Okoye<sup>8</sup>

Associate Professor<sup>3</sup>, Lecturer II<sup>1,6,7,8</sup>, Principal Medical Laboratory Scientist<sup>5</sup>, Senior Medical Laboratory Scientist<sup>4</sup>, Intern Medical Laboratory Scientist<sup>2</sup>

Department of Medical Laboratory Science, Nnamdi Azikiwe University, Nnewi Campus.<sup>1,2,3,4,6,7,8</sup>

Department of Histopathology, National Veterinary Research Institute, Vom, Plateau State.<sup>5</sup>

Department of Medical Laboratory Science, Babcock University, Ilishan Remo, Ogun State.<sup>2</sup>

Corresponding Author: Samuel Ifedioranma Ogenyi

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### ABSTRACT

Cervical smear samples of one hundred (100) copper intra uterine contraceptive device (IUCD) users, attending family planning clinic in Nnamdi Azikiwe University Teaching hospital (NAUTH) Nnewi, were collected and stained with Papanicolaou method. The subjects were categorized based on the duration of IUCD usage and samples collected using Ayres spatula with the aid of speculum. Smears were made on pre-labelled slides which were inserted immediately into jars of 95% ethanol fixative for 30 minutes, before staining by Papanicolaou method.

Nineteen (19) percent showed abnormal changes while 81% had normal and benign changes. Moreover, 19% revealed perinuclear halo characteristic of *Human papillomavirus* (HPV) infection. Only 6% of the subjects had gone for Pap smear test before. Pap smear test should be performed before insertion of IUCD.

**Key words:** Pap Smear, Women, Family Planning, Clinic, IUCD, Tertiary, Healthcare, Facility, Cervical Smear, Epithelial Cells.

### INTRODUCTION

Intrauterine contraceptive device (IUCD) is a device inserted into the uterine cavity and left for varying periods of time for the purpose of contraception. They are usually made up of polypropylene impregnated with barium sulphate, for visualizing them on x-rays. The need for long-acting birth control methods which are easy to use and devoid of specific action at the time of coitus and during daily activities was advocated for by [1] It was noted that IUCD is the most cost-effective, temporary contraceptive method for long term use, which is preferred by most women because

of high efficacy, safety and convenience. [2] Approximately 160 million women worldwide use this method for birth control. [3] According to Thierry [4] Grafenbeg introduced intrauterine contraceptive silver ring in 1928 but it vanished from the scene soon after its introduction. Different designs of IUCD abound. The modern intrauterine contraceptive device (IUCD) is a form of birth control in which a small "T"-shaped device, containing either copper or progesterone, is inserted into the uterus [5] A report by Winner *et al*, [6] reveals that IUCDs are the most effective, reversible, long acting birth control devices. As of

2002, IUCDs were the most widely used form of reversible contraception, with nearly 160 million users worldwide. [7]

There is increased use of IUCD women as birth control measures all over the world and especially in South East Nigeria. Approximately 160 million women worldwide use this method for birth control. [3]

This may be attributed to increased awareness on child spacing, birth control and family planning. The choice of IUCD over other contraceptive devices according to Buckley *et al* was also attributed to its simple way of producing contraception without patients' compliance. [8] The authors also noted that the device is not rendered ineffective by any drug. There are two broad categories of IUCDs; the non hormonal copper IUCD and the hormonal IUCD.

Cytological changes associated with the presence of IUCD have been reported in cervical smears and in uterine fluid. Several different cell types have been noted in the smear. Nasser *et al*, [9] reported two patterns of benign endocervical and endometrial cell atypia following IUCD use. According to the authors, the first pattern mimics adenocarcinoma with atypical glandular cells arranged in small groups or as isolated cells with abundant vacuolated cytoplasm, including some signet ring cells. These cells show enlarged nuclei with hyperchromatic coarse granules and usually visible nucleoli. The second pattern consists of isolated cells with enlarged hyperchromatic nuclei with very high nuclear to cytoplasmic ratio; thus resembling cells from an HSIL except that they have nucleoli. Sometimes reparative changes are also present and the background is inflamed.

The authors, however, opined that if the patient has an IUCD, these changes should be regarded as benign. Similarly, earlier report by Melissa *et al.*, [10] showed that IUD use was not significantly associated with CINII/III.

Pillay *et al.*, [11] in an independent study reported that about 2/3 of their study

population had symptoms following insertion of the IUCD; 40% complained of vaginal discharge, mostly mucoid in nature while 10 % had muco-purulent or blood-stained discharge and about 3 % had pelvic pain and low grade fever, which according to them were on and off.

Cytological findings were also reported by the authors; leukocytosis (80%), increase in the number of histiocytes with multinucleate giant forms (42 %) and the presence of *G. vaginalis* (42%), *Monilia* (28%), *Trichomonas vaginalis* (32 %), *Actinomyces-like* organisms (2%) and *Amoeba* (0.6%). Further observations include, morphological atypias, both in squamous and endocervical columnar cells, 70% of these atypias were benign with varying degree of severity (from mild to severe) representing inflammatory, degenerative or reparative changes. Hyperplasia and papillary proliferation of endocervical Epithelium, multinucleation and squamous metaplasia were also observed.

Furthermore, Nayak *et al*, [12] reported that 47.5% (134/282) of their subjects showed normal cytology as compared to 58% (58/100) of the controls on their Clinicocytological study in copper-T users.

The authors also reported that 22.7% (64/282) of the subjects showed infection of various types compared to 18% of the controls with *Trichomonal* infection being the commonest (73.4%). Reactive and reparative changes were seen in 26.9% (76/282) of the subjects while *atypia* of squamous cells of undetermined significance (ASCUS) was seen in 1.4% of the subjects as compared to 2% of the controls.

No case of invasive cancer was established by the authors but however associated prolonged use with increased incidence of infection, ASCUS and low grade intraepithelial lesion (LSIL) and therefore advocated for continuous surveillance of those with IUCD.

Inflammatory cervical epithelial changes, intraepithelial lesion (LGSIL), no case of high grade squamous intraepithelial lesion (HGSIL) and no malignant cytological changes were also reported. Similarly, Baris and Keles [13] observed increased rate of genital infections, frequency of reactive-dysplastic cellular changes and more severe inflammation amongst IUCD users, but however reported no significant difference, observed in terms of the incidence of squamous cell abnormalities, except ASCUS. Also according to the authors, the presence of atypical glandular cells and reactive findings was significantly higher than the control group. Conversely, it was reported that women who use IUCD halved the risk of developing cervical cancer compared to those that had never used an IUCD, contrary to popular belief that IUCD could be a risk factor of cervical cancer. [14] The association of HPV infections with IUCD used was not substantiated. A survey by Curtis *et al*, [15] equally showed no association between IUCD use and risk of cervical neoplasia. A decreased risk of endometrial cancer also was seen for increased years of IUCD use. [16] A reduction in risk cervical and endometrial cancers was observed by Tao *et al*, [17] regardless the duration of IUCD use or age at first and last use.

Sequel to increased campaign on Intrauterine Contraceptive Device (IUCD) as a method of choice for birth control and the need to decrease parity while still maintaining active sexual life style, vis-à-vis the relative advantage over other contraceptive devices, there is increased application of IUCD by women in the South East Nigeria, as contraceptive option. Therefore, the need for this study becomes imminent, to determine the effect of use of this device on the cervical epithelium. This study amongst other things seeks to evaluate the effect of IUCD on the cervical epithelium, determine the relationship between the use of IUCD and cervical cell dysplasia and determine the relationship between effect and duration of use.

## MATERIALS AND METHODS

This cross sectional study was carried out in Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Anambra State of Nigeria (NAUTH). The study population consist 100 Women attending the Family planning clinic of the Hospital. Consent of each participant was sort through written informed consent form while demographic data and duration of IUCD use were obtained using questionnaire. The minimum size was determined using Yaro Yamane formula. [18] Approval for this study was obtained from the Ethical Committee Nnamdi Azikiwe University Teaching Hospital Nnewi (REF No: NAUTH/CS/66/VOL.4/75).

The subjects were grouped into seven, (7) A to G based on duration of IUCD insert as follows:

- Group A: Less than 1 year.
- Group B: Between 1 and 2 years.
- Group C: Between 3 and 4 years.
- Group D: Between 5 and 6 years.
- Group E: Between 7 and 8 years.
- Group F: Between 9 and 10 years.
- Group G: Greater than 10 years.

**Sample Collection:** PAP smears (cervical smear) samples were collected from each subject with the aid of speculum, using plastic Ayre spatula. Mono layer smears made on pre-labelled slides and inserted immediately into coplin jars containing 95% ethanol fixative and were allowed to fix for at least 30minutes to allow proper fixation. [19]

### Staining

The smears were stained by Papanicolaou staining technique. [20]

### Microscopy and Photomicrography

The stained slides were examined using Leica microscope and photomicrographs of slides taken. Slide reporting was based on Bethesda 2001 system for reporting of Pap smear results. [18]

## RESULTS

Out of 100 subjects screened, 19% (19) showed abnormal epithelial changes while the remaining 81% (81) showed

normal and benign changes. Nineteen percent (19%) of the study population showed HPV perinuclear halo (Table 1). High grade intraepithelial lesion (HSIL) was seen in 4% (4) of the subjects, 7% (7) showed Low grade intraepithelial lesion (LSIL), while 8% (8) had atypical squamous cells of undetermined significance (ASC-US) (Table 2).

In group A, 9 subjects show inflammatory reactive changes, 3 and 2 show LSIL, HSIL respectively (Figure 1). Five (5) subjects from group B revealed

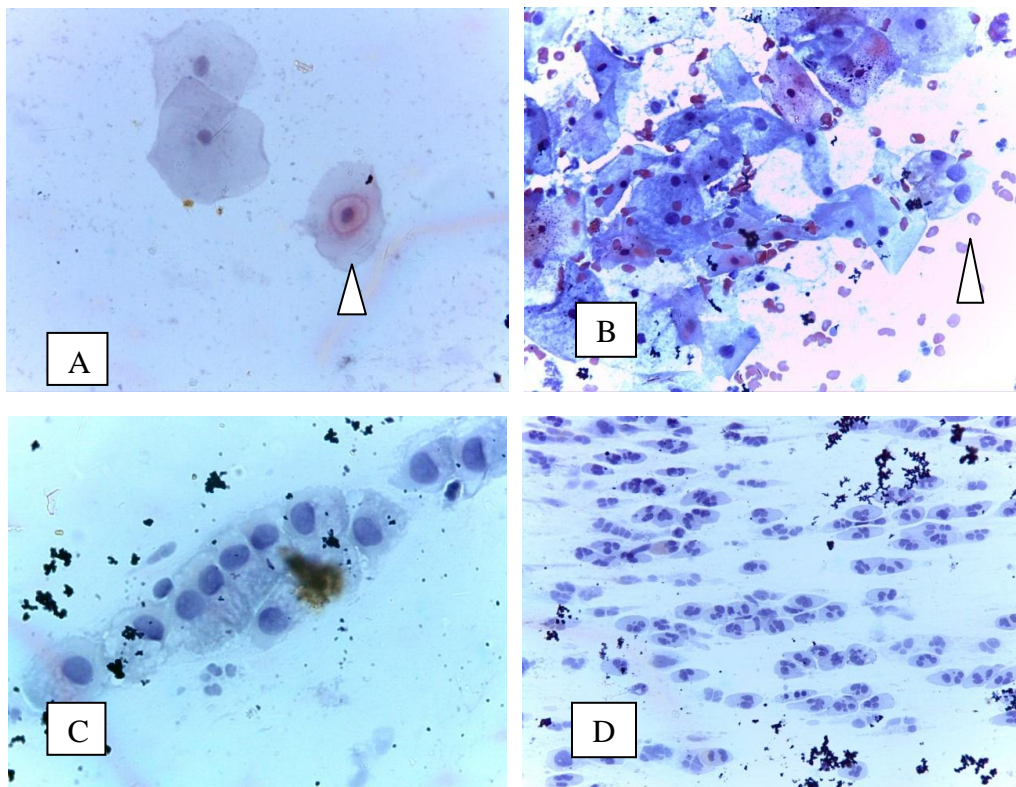
presence of HPV perinuclear halo, 1 shows LSIL, and 2, ASC-US (Figure 2) whereas all subjects in Group C were normal (Figure 3). Presence of HPV perinuclear halo was found in 2 subjects of group D, 2 subjects showed LSIL, while 7 showed inflammatory (benign) changes (Figure 4). Six (6) subjects in group E showed normal epithelial cell morphology, While 1 and 2 showed LSIL and ASC-US respectively (Figure 4). HPV perinuclear halo, HSIL, LSIL and ASC-US were found in subjects of group F and G (Figure 5).

**Table 1: Percentage of Pap smear pattern amongst the study population**

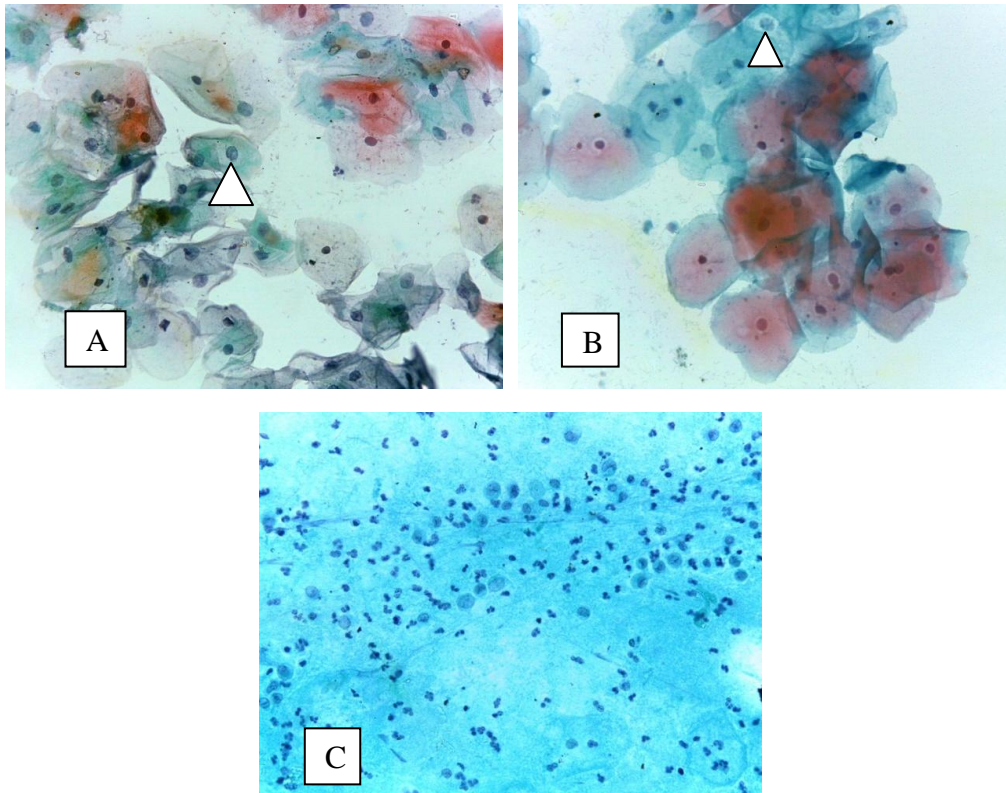
Abnormal Epithelial cells (%)	HPV halo (%)	Normal/Benign cells (%)
19	19	81
19% showed abnormal cells while 81% were normal /benign. Human Papilloma Virus (HPV) halo were found in 19%		

**Table 2 Pattern of abnormal cells amongst the study population**

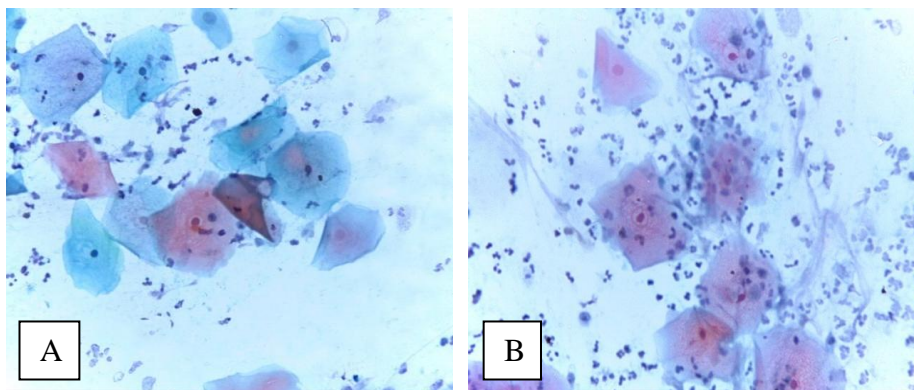
Group	ASC -U (%)	LSIL (%)	HSIL (%)	Normal/Benign cells (%)
A(27)	0	3	2	22
B(37)	2	1	0	34
C(8)	0	0	0	8
D(11)	2	0	0	9
E(9)	2	1	0	6
F(5)	1	1	1	2
G(3)	1	1	1	0
Cellular abnormality was more pronounced in group A while group C had no abnormality.				



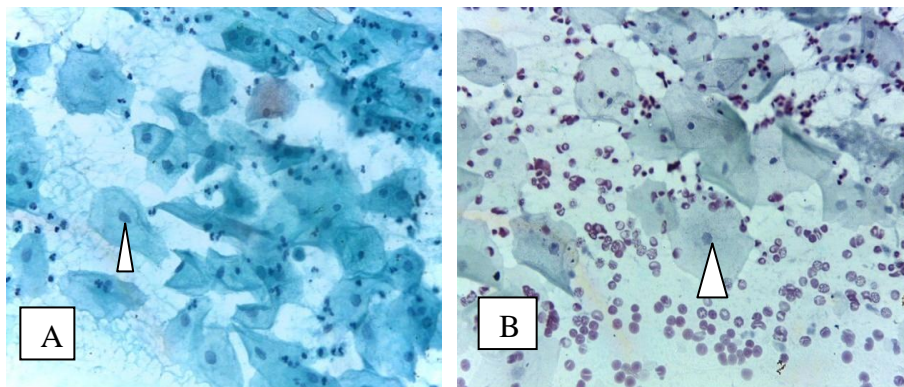
**Figure 1:** Pap smear of subjects in group A showing (A) Inflammatory reactive changes (arrow head), (B) Low Grade Squamous Intra-epithelia Lesions (LSIL) mild dysplasia, moderately enlarged nuclei (arrow head) (increased nucleus/cytoplasmic ratio) (C) and (D) High Grade Squamous Intra-epithelia Lesions (HSIL) (Mag: X 400).



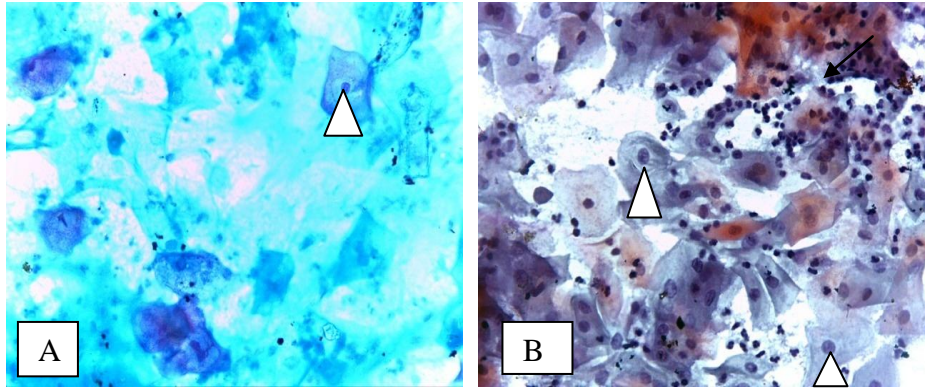
**Figure 2:** Photomicrograph of cervical smears of subject in group B showing (A) and (B) presence of *Human Papilloma Virus* (HPV) halo (arrow head), (B) Low Grade Squamous Intra-epithelia Lesions (LSIL) (mild dysplasia) and (C) Low Grade Squamous Intra-epithelia Lesions (LSIL) (nude nuclei) (Mag: X 400)



**Figure 3:** Photomicrograph of Pap smear of subjects in group C showing (A & B) inflammatory reactive changes (Mag: X 400).



**Figure 4:** Photomicrograph of Pap smears of subject in group D & E showing Atypical Squamous Cells of Undetermined Significance (ASC-US) (Irregular nuclear outline) (Mag: X 400).



**Figure 5:** Photomicrograph of cervical smears of subjects in group F&G showing Presence of *Human Papilloma Virus* (HPV) halo (Mag: X 400).

## DISCUSSION

Cytological changes associated with IUCD have been documented. [9, 17, 10-16,20] This study investigates the effect of copper containing IUCD on cervical epithelium.

The study reveals that the most frequent epithelial cell abnormality was ASC-US while HSIL was the least frequent. Inflammatory reactive changes characteristic of IUCD insert were also observed in a good number of subjects. HPV peri nuclear halo were evident in a good number of subjects, most times co-existing with HSIL, LSIL and ASC-US. This report agrees with the findings of Bilian, [20] Nasser *et al*, [9] and Pillay *et al*, [11] Bilian, [20] reported that the copper – containing IUCD produces an inflammatory environment in the endometrium. Similarly, Nayak *et al*, [12] observed reactive and reparative changes in subjects with IUCD insert. Enlarged hyperchromatic and very high nuclear to cytoplasmic ratio which resemble cells from a HSIL except that they have nucleoli were also reported by (Nasser *et al*. [9]

Pillay *et al*, [11] was not left out in these findings. They observed hyperplasia and papillary proliferation of endocervical epithelium, multinucleation and squamous cell metaplasia.

HPV infection, especially with Type 16 and 18, has been incriminated as the etiologic agent for cervical cancer. Therefore, subjects with the infection may be at increased risk of developing cervical cancer. This, however, is dependent on the

HPV genotype. Castellsague *et al*, [14] reported that IUCD insert does not modify the likelihood of prevalent HPV infection, but might affect the likelihood of HPV progression to cervical cancer. Curtis *et al*, [15] likewise showed that no trend in associations was observed with characteristics of IUCD use, type of IUCD and histological type of cancer. Nayak *et al*, [12] suggested that there is no precipitous carcinogenicity of Cu-T but a long term follow up is needed. That subjects fitted with intrauterine devices deserve continuous surveillance but are not subjected to increased risk of malignancy because of their choice of birth control method. Baris and Keles [13] reported that in the intrauterine device group, the presence of atypical glandular cells and reactive findings was significantly higher than the control group.

HSIL and LSIL were more prevalent in group A while ASC-US was prevalent in groups E. This surprisingly, shows no progression of epithelial cell abnormality with prolonged duration of IUCD insert. Moreover, one may infer from this finding that the epithelial cell abnormality may not be a direct effect of IUCD insert, but however, there is an indication that IUCD may had enhance the change. Human papilloma virus infection seems to enhance epithelial cell abnormality as most subjects with HSIL and LSIL showed presence of peri nuclear halo.

These findings, however, may not be absolutely, exclusively, associated with

IUCD insert, especially because the epithelial abnormalities were not found to progress with duration of insert. Besides, Pap smear of subjects was not screened before IUCD insertion and these changes could have been existing. This therefore, underscores the importance of Pap smear screening, especially, prior to IUCD insertion.

## CONCLUSION

It could be deduced from the present study that IUCD insert elicit reactive and inflammatory changes on the cervical epithelium which do not usually progress to cervical lesions. HSIL, LSIL and ASC-US were found amongst subjects, but were not dependent on duration of insert. There was presence of HPV halo especially in subjects with prolonged duration of insert. Pap smear test should be performed before insertion of IUCD.

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