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Detection of Cervical Cytological Abnormalities by Pap smears Method among Women Attending the Screening Clinic of Nsambya Hospital

Mwesigwa Boaz[1]*, Andrew Livex Okwi[2] and Othieno Emmanuel[2]

[1]Department of Cytology, Alzahra Specialty Hospital, Mogadishu, Somalia

[2]Department of Pathology, School of biomedical sciences, College of Health Sciences, Makerere University, Uganda

ABSTRACT

Background: Cervical cancer is an important public health problem. In Uganda, it ranks the most frequent cause of cancer among women aged between 15 to 44 years of age. Early detection and eradication of cervical cancer and its precursor lesions is the mainstay for control of this disease. The Pap smear method is the most cost-effective means of screening cervical pre-malignant, malignant processes and non-neoplastic lesions. Aim: To describe the cervical cytological abnormalities as detected byPap smear method and to determine the prevalence of such abnormalities.

Methodology: This was a prospective study, in which a total of 175 women were recruited from May to June, 2016. Cervical samples were collected from these women and stained according to the papanicolaou staining protocol. Results were reported using the 2014 Bethesda reporting system.

Results: Out of 175 cases, 163 (93.1%) were reported as negative for intraepithelial lesion or malignancy [NILM]. Cervical intraepithelial lesions were reported in 12 (6.9%) cases which included atypical squamous cells of undetermined significance [ASCUS] in 4(2.3%) cases, atypical squamous cells cannot exclude high grade squamous intraepithelial lesions [ASCH] in 1(0.6%) case, low-grade squamous intraepithelial lesion [LSIL] in 5 (2.9%) cases, high-grade squamous intraepithelial lesion [HSIL] in 1(0.6%) case and atypical glandular cells [AGC] in 1(0.6%) case.

Conclusion: Cervical cytology by Pap smear method should be used to screen women routinely because it is an effective method in detecting pre-malignant and malignant lesions of the cervix.

***Corresponding author**

Mwesigwa Boaz, Alzahra Specialty Hospital, Mogadishu, Somalia, Tel: +256705482996; E-mail: mwesigwaboaz155@gmail.com

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Abbreviations

AGC, Atypical Glandular Cells; ASCUS, Atypical Squamous Cells of Undetermined Significance; HSIL, High Grade Squamous Intraepithelial Lesion; LSIL, Low Grade Squamous Intraepithelial Lesion; NILM, Negative for Intraepithelial Lesion or Malignancy; HIV, Human Immunodeficiency Virus.

Introduction

Globally, there are over 500,000 new cases of cervical cancer occurring annually and in excess of 270,000 deaths accounting for 9% of female cancer deaths. 85% of these new cases occur in developing countries [1]. The highest burdens of cervical cancer have been reported in Asia, Southern Africa, Central America, Eastern Africa and South America. In all of these regions, the rate is more than 40 cases per 100,000 women [2]. In East Africa, cervical cancer was also reported to be the most common female cancer affecting 44 per 100,000 women and the highest female cancer related mortality accounting for 35 per 100,000 women. Uganda has one of the world's highest cervical cancer incidence rates of 45.6 per 100,000 women and cervical cancer deaths at 25 per 100,000 women [3].

In 1941, George Papanicolaou demonstrated a pap test for the early detection of cervical cancer, contributing toward the creation of screening programs [4]. The Papanicolaou test (abbreviated as Pap test, also known as Pap smear) is a method of cervical screening used to detect potentially precancerous and cancerous processes in the cervix (opening of the uterus or womb) [5]. The Pap test is considered by many to be the most cost-effective cancer reduction program ever devised [6]. This test has been assessed over the last 50 years in a wide range of settings in developed and developing countries [7].

Materials and Methods

Study Design

This was a prospective descriptive study.

Study Area

This study was conducted in the pathology department of Nsambya hospital, faith-based not-for-profit hospital. Nsambya Hospital is located on Nsambya Hill in Makindye Division, one of the five administrative divisions of the city. It lies approximately 5 kilometers southeast of the central business district of Kampala. The

coordinates of Nsambya Hospital are: 0°18'06.0"N, 32°35'10.0"E (Latitude: 0.301667; Longitude: 32.586112). It has a bed capacity of at least 540 beds. As a tertiary hospital, it is involved in patient care, research and teaching. On average, this department receives at least 10 Pap smears from the screening clinic.

Study Population
This study consisted of all women attending the screening clinic of Nsambya hospital.

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Study Duration
The study was carried out in four months from February to May 2016.

Sample Size Estimation
For calculation of sample size, the formula below was used n = $(z^2pq)/t^2$,where z is the value of 1.96 (zinnormal distribution curve), n is the required sample size, p is the estimatedprevalence,q = 100−p,

And its the tolerance sampling error (5%). A prevalence p of 13.1%was used in the estimation of sample size n [8]. Using this equation, a total sample size of 175 individuals was therefore computed.

Selection Criteria
Inclusion Criteria
All women 18years and above were included in this study.
All women who gave an informed consent were included in this study.

Exclusion Criteria
All women with unsatisfactory Pap smears were excluded from this study.
All women in their menstrual periods were excluded from this study.

Sample Collection, Processing and Reporting
Pap smears were collected by well-trained gynecological nurses. In the process of collecting smears, both a wooden spatula and an end cervical brush were used. The first step involved placing the spatula firmly against the ectocervix with the long projection extending into the endocervical canal. The spatula was rotated several times 360° around the portion and removed. The endocervical canal was sampled using the endocervical brush. The brush was placed into the endocervical canal so that the last few bristles remain visible and then gently rotated 90° to 180° once in a single direction. The material from both the spatula and the endocervical brush was spread on the same slide, fixed with 95% alcohol and then sent to the laboratory for processing. The slides were reported by a well-trained Cytotechnologist using the 2014 Bethesda reporting system.

Results
Demographic Characteristics
A total number of 175 cases of Pap smears were received and interpreted over a period of 4months. The mean age group was 41years with a standard deviation of 10.5 and a range of 19 to 73years. Majority of patients were in the age group of 31 to 40years followed by the age group of 21 to 30 years which constituted 22.3%. A maximum number of participants (57.7%) was multiparous (para ≥3) followed by para 1-2 which constituted (32.6%). These findings were summarized in table 1.

Table 1: Demographic characteristics of the respondents

Variable	Frequency	Percentage
Age category (years)		
11-20	1	0.6
21-30	39	22.3
31-40	62	35.4
41-50	27	15.4
51-60	37	21.1
61-70	8	4.6
71-80	1	0.6
Parity		
0	17	9.7
1-2	57	32.6
≥ 3	117	57.7
Total	175	100

Cytology Results on Pap Smear
Out of 175cases, 163(93.1%) were reported as negative for intraepithelial lesion or malignancy [NILM]. Cervical intraepithelial lesions were reported in 12 (6.9%) cases including atypical squamous cells of undetermined significance [ASCUS] in 4(2.3%) cases, atypical squamous cells cannot exclude high-grade squamous intraepithelial lesions [ASCH] in 1(0.6%) case, low-grade squamous intraepithelial lesion LSIL in 5 (2.9%) cases, high-grade squamous intraepithelial lesion [HSIL] in 1(0.6%) case and atypical glandular cells [AGC] in 1(0.6%) case. These findings were summarized in table 2.

Table 2: Cytological findings on a Pap smear according to the 2014 Bethesda classification

Cytological result	Frequency	Percentage (%)
NILM	163	93.1
ASCUS	4	2.3
ASCH	1	0.6
LSIL	5	2.9
HSIL	1	0.6
AGC	1	0.6
Total	175	100

NILM-Negative for intraepithelial lesion or malignancy, ASCUS-Atypical squamous cells of undetermined significance, ASCH-Atypical squamous cells cannot exclude high-grade squamous intraepithelial lesion,LSIL-Low grade squamous intraepithelial lesion,HSIL-High grade squamous intraepithelial lesion

Infections and Other Non-Neoplastic Findings on a Pap smear
Out of 163 normal smears [NILM], 18(11%) showed features of Bacterial vaginosis, 5(3.1%) had features of Candida, 1(0.6%) showed Gardnerellavaginalis, 105(64.4%) showed an inflammatory smear, 18(11%) showed changes of atrophy and 16(9.8%) showed squamous metaplasia. These findings were summarized in table 3.

Table 3: Distribution of infections and other non-neoplastic findings on a Pap smear

Cytodiagnosis	Frequency	Percentage (%)
Baccterialvaginosis	18	11.0
Candida ssp	5	3.1
Gardnerellavaginalis	1	0.6
Inflammation	105	64.4
Atrophy	18	11.0
Squamous metaplasia	16	9.8
Total	175	100

Comparison between Cervical Intraepithelial Lesions with Demographic Characteristics

There was an increase in cervical intraepithelial lesions with increasing age. The highest peak of ASCUS (1.1%) and LSIL(1.1%) was observed in the age group of 31 to 40 years. There was also a progressive rise of cervical intraepithelial lesions with increasing parity. The maximum parity (28.6%) was seen in women who had between 3-4 children. These findings are shown in table 4.

Table 4: Distribution of cervical intraepithelial lesions according to the demographic characteristics

Variable	Frequency (%)	ASCUS n(%)	ASCH n(%)	LSIL n(%)	HSIL n (%)	AGC n(%)
Age (years)						
11-20	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
21-30	38(21.7)	1(0.6)	0(0.0)	1(0.6)	0(0.0)	0(0.0)
31-40	62(35.4)	2(1.1)	0(0.0)	2(1.1)	0(0.0)	0(0.0)
41-50	27(15.4)	1(0.6)	0(0.0)	1(0.6)	0(0.0)	0(0.0)
51-60	38(21.7)	0(0.0)	0(0.0)	0(0.0)	1(0.6)	1(0.6)
61-70	8(4.6)	0(0.0)	1(0.6)	1(0.6)	0(0.0)	0(0.0)
71-80	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Parity						
0	17(9.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
1-2	57(32.6)	2(1.1)	0(0.0)	1(0.6)	0(0.0)	0(0.0)
3-4	50(28.6)	1(0.6)	0(0.0)	3(1.7)	1(0.6)	0(0.0)
≥ 5	51(29.1)	1(0.6)	1(0.6)	1(0.6)	0(0.0)	1(0.6)
Total	175(100)	4(2.3)	1(0.6)	5(2.9)	1(0.6)	1(0.6)

Discussion

Cervical cancer is a largely a preventable disease that is preceded by a long pre-invasive lesion and remains a leading cause of mortality. This high mortality is largely because of late presentation and diagnosis. There is no standardized strategy for primary and secondary prevention of cervical cancer in developing countries. In contrast, the prevalence and mortality of invasive cancer in developed countries has reduced drastically because of organized screening methods that tend to diagnose and treat the pre-invasive lesions [9]. Atotal of 175 cases of Pap smears were screened. Majority of the patients (35.4%) were from age group of 31 to 40 years and (22.3%) patients from the age group of 21 to 30years. Similar findings were reported in Nigeria [10].

In this study, prevalence of cervical intraepithelial lesions was 6.9%. This prevalence compares well with 7.0% prevalence in a study done in Nigeria [11]. In Rwanda, the prevalence of cervical cytological abnormalities (20%) was far higher in comparison probably because the study population comprised of people infected with HIV[12]. Prevalence of epithelial abnormalities around the world showed wide variation from 0.98% to 15.5% [13]. The possible reasons to explain this could be variation in criteria, quality checks used & intrinsic differences in population studied including risk factors & sample size studied. Another study conducted inNingen Dock, Japan showed a low prevalence (1.2%) of the cervical cell abnormalities [14]. The explanation behind this result is mostly because of their cultural traditions and great concern regarding their health check-ups and less likelihood of having multiple sexual partners. ASCUS/LSIL ratio in our study was 0.79 (normally should be less than 3) which is good quality measure as has been suggested by the authors of The Bethsda System. In this study, it was observed that the prevalence of LSIL (1.1%) was more in premenopausal women of 31 to 40 age group and the prevalence of HSIL (0.6%) was more common in postmenopausal women of 51 to 60 age group. This is probably because sexual activity is higher in younger women as compared to older women. This study demonstrated a higher prevalence of cervical intraepithelial lesions in women who had more than 3 pregnancies. Prevalence of SIL was maximum (6.9%) in high parity group bearing ≥ 3 children [15]. Castañeda-Iñiguez, et al.also stressed that women with number of pregnancies possess a high risk of developing cervical dysplasia than women with less than three [16].

Encounters of inflammation in this study were very common (64.4%) under the category of negative for intraepithelial lesion or malignancy (NILM). Bacterial vaginosis, Candida and Gardnerellavaginalis were the specific causes of inflammation. In the present study bacterial vaginosis was the most prevalent infection (11.0%) among the NILM category however this prevalence was lower as compared to 32.8% prevalence in a study conducted in India [17]. This difference is probably because the latter study comprised of a study population from rural and urban areas.

Limitations of the Study

This study was without important limitations. First it was essentially a cross-sectional study, that was time bound with a Pap smear taken only once at recruitment. Follow-up with multiple Papanicolaou smears over a period of time would have been ideal, with more number of samples to increase the power of the test.

Conclusion and Recommendations

The prevalence of cervical intraepithial lesions according to this study was 6.9% which is statistically high. Cervical cytology by Pap smear method is an effective method in detecting pre-malignant, malignant lesions of the cervix and other non-neoplastic diseases. Therefore, the government of Uganda through the ministry of health should organize public health education on cervical cancer with emphasis on its etiology, risk factors and methods of prevention.

Conflict of Interest

Nil

Ethical Approval

The permission to carry out this study and disseminate its findings was obtained from the Institutional Review Boards of both Makerere University College of Health Sciences and Nsambya Hospital.

Consent

Informed consent was obtained from the study participants before they were enrolled in the study.

Authors' Contributions

Mwesigwa Boaz designed the study, participated in slide preparation and interpretation collected data, managed and analyzed it, and participated in manuscript development and revision. Othieno Emmauel was responsible for study design, slide interpretation and data analysis, manuscript development, and reading of manuscript. Andrew livexOkwi was responsible for study design and manuscript reading. All authors have read and approved the final manuscript.

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