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Risk Factors in Women with Abnormal Pap Smears in a Tertiary Health Institution in North-Central Nigeria

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Abstract

Background: cervical cancer remains an important health problem of women worldwide with a high morbidity and mortality. Most cervical cancers originate from cells infected with human papillomavirus (HPV) which is sexually transmitted. It is a preventable condition and considerable effort goes into detecting and treating the pre-invasive disease. Papanicolaou smear(Pap smear) test for cervical cancer screening is the most utilized and successful approach to cancer screening.

General Objective: The objective of this study is to determine the risk factors associated with abnormal pap smears among women that present for cervical cancer screening in Jos University Teaching Hospital (JUTH) North-Central Nigeria.

Methods: This study is a cross-sectional study of 200 consecutive women who presented for cervical cancer screening at the cancer screening centre of JUTH. Data were collected from the participants using a proforma after obtaining informed consent. The results of the smears obtained were entered in this proforma for each patient and analyzed using EPI-info 3.5.2. The strength of the association between the risk factors and abnormal pap smear results were evaluated using logistic regression analysis and significance is defined as P< 0.05.

RESULTS: Results of this study shows that 9.5% of the study population had abnormal Pap smears and the commonly diagnosed abnormal type is ASC-US. There was statistically significant relationship between abnormal cytology result and age, number of sexual partners, early age at first sexual intercourse, HIV status and combined oral contraceptive use.

CONCLUSION: The commonest abnormal Pap smear is ASCUS and more than 80% of the patients got information on cervical cancer screening from their healthcare providers and all women irrespective of their educational status are willing to undergo the screening when given the information.

Keywords: Cervical cancer, JUTH, Pap smear, Risk Factor, Screening

I.   Introduction

Cervical cancer remains an important health problem for women worldwide with high morbidity and mortality[1,2]. Cervical cancer is the second most common cancer among women, with only breast cancer occurring more commonly[1,2]. Globally, about half a million new cases are diagnosed each year and a quarter of a million or more deaths are recorded from this disease each year[3] Of the number of new cases diagnosed each year, over 80% occur in developing countries and in most of these countries cervical cancer is the commonest cancer in women[4,5,6]. This situation is compounded by the fact that in developing countries 75% present with advanced stage disease, which is the converse in developed countries where 75% present early and cure can be realistically expected[1,7,8].

Most cervical cancers originate from cells infected with the human papillomavirus (HPV), which is sexually transmitted[9,10,11]. Early sexual intercourse, multiple sexual partners, and increased parity are associated with a substantially greater risk of developing cervical cancer. In addition, smokers are at greater risk, although the mechanism underlying this risk in not known[1,12,13,14].

Cervical cancer is a preventable condition and considerable effort goes into detecting and treating the preinvasive disease[15,16]. Cervical cytology is an effective means of screening for cervical premalignant and malignant conditions and is widely utilized in developed countries[14,17,18,19]. Papanicolaou stained cervical smears (Pap Smear) is a simple and highly effective procedure for detection of premalignant cervical disease[1,2]. George Papanicolaou (1883-1962) laid the original foundation for the prevention of cervical carcinoma over half a decade ago when he described this cytological method for the detection of pre-invasive lesions which is now popularly referred to as the Pap smear test[4,14,20,21]. Since then other screening methods have been described but the Pap smear test remains the most cost effective approach to cervical cancer screening worldwide[4,11]. These newer methods include human papilloma virus (HPV) DNA testing, Cervicography, speculoscopy, polar probe, visual inspection (aided and unaided), computer based screening techniques like papnet, autopap and autocyte screen[11,14].

Pap smear test for cervical cancer screening is the most utilized and successful approach to cancer screening[20,21,22,23]. This is the only cancer with a well studied and understood single cause and dramatic changes in treatment have occurred over the past three decades and now cancer prevention by prophylactic vaccination is expected to significantly reduce incidence[24,25,26].

In all probability cervical cancer is the only gynaecological cancer that satisfies the well recognized WHO criteria for the implementation of a screening programme-existence of well defined premalignant lesion, long latent period in which premalignant change or occult cancers can be detected and effectively treated thereby altering the natural history of the disease, a clearly defined viral aetiology which could be incorporated as a marker in mass screening program, easy and direct access of the uterine cervix for examination and sampling and effective treatments available for the premalignant phases[2].

Cervical cancer is the second most common cancer in women globally after breast cancer and is the most common gynaecological cancer in women[1,22]. This disease is responsible for the mortality of over a quarter million of women globally yet it is a preventable disease[27,28]. Most women with this disease in our environment present with advanced stage when little or nothing can be done to save the life of the patients. It is sad that even though screening facilities are available in some few centres they are being underutilized. The screening can diagnose premalignant stage of the cancer in which treatment can be effectively offered.

Knowing the common risk factors and the prevalence of abnormal smears in our environment can go a long way in helping us use the statistics in policy making regarding the setting up of screening centres, enlightenment of women on the need for regular and consistent cervical cancer screening as well as the commitment of governments at all levels towards the programmes using the information obtained.

II.   Study Area

This study was carried out at the cervical cancer-screening unit of the Department of Obstetrics and Gynaecology, Jos University Teaching Hospital (JUTH), Jos, North-Central Nigeria. JUTH is a federal tertiary health institution situated in Jos,Plateau State, Nigeria.

III.   Study Population

The study population was the women seen at the cervical cancer screening unit of JUTH between 1st April and 30th September, 2013.

IV.   Study Design

This is a cross-sectional study of clients, who presented for cervical cancer screening using Pap smear at thcervical cancer screening unit of the department of Obstetrics and Gynaecology of Jos University Teaching Hospital (JUTH), North-Central Nigeria between 1st April and 30th September, 2013.

V.   Inclusion/ Exclusion Criteria

All women who presented for cervical cancer screening at the centre and consented to participate in the study were included with the exceptions of women who have been diagnosed with cancer of the cervix, women who have undergone any procedure for the treatment of abnormal Pap smear and were on follow up as well as Women who did not consent.

VI.   Ethical Consideration

This proposal was presented to the research and ethical committee of Jos University Teaching Hospital for approval which was granted. Informed consent obtained from the subjects before enlistment for the study.

VII.   Sample Size

The sample size is calculated using the formula[29,30]

$$N = z^2 pq/d^2$$

And a sample size of 200 was arrived at and used as the minimum sample size.

VIII.   Data Collection and Processing

After explaining to patients and obtaining informed consents, smears were collected using a cytobrush after exposing the cervix by a Cusco's speculum. The samples collected were then transferred to glass slides. Two slides were prepared for each patient and the slides are fixed with 95% ethanol. Information such as age, parity, alcohol consumption, age at first intercourse, multiple sexual partners etc are obtained from the patient and recorded on a specially designed proforma and numbered for each patient. The same numbers were also marked on the slides without the names of the patients. The slides were then sent to the pathology department. Each slide was processed and carefully examined by the pathologist. The abnormalities were reported using the Bethesda system of classification and results that will require colposcopic examination will have it done in the centre.

IX.   Data Analysis

The data was extracted from the structured questionnaires, entered and analyzed by a computer software EPI-info 3.5.2. and the strength of association between the various risk factors and abnormal pap smear results was evaluated using multivariate logistic regression analysis and $P < 0.05$ is considered as statistically significant.

X.   Results

TABLE 1: Socio-demographic Variables of the Study Population

Variables	Number(n = 200)	Percentage (%)
Age group		
20-29	45	22.5
30-39	67	33.5
40-49	57	28.5
≥50	31	15.5
Marital status		
Single	7	3.5
Married	169	84.5
Divorced	6	3.0
Windowed	18	9.0
Parity		
0	25	12.5
1	30	15.0
2-4	77	38.5
>4	68	34.0
Educational level		
No formal education	18	9.0
Primary	26	13.0
Secondary	67	33.5
Tertiary	89	55.5
Alcohol consumption		
Yes	22	11.0
No	178	89.0
HIV status		
Positive	14	7.0
Negative	186	93.0

TABLE 1 shows the socio-demographic variables of the study population. It shows that majority of the screened population were in the 30-39 age group (33.5%), about 84.5% of the population were married currently and 87.5% of the study population have delivered at least once while 12.5 % have not delivered before.

The educational status of the population showed that 91% have some form of formal education and 9% had no formal education.

The HIV status shows that 7% were positive while 93% were negative .Only 11.0% of **the study population take alcohol.**

TABLE 2: Gynaecologic Variables of the Study Population

Variables	Number(n = 200)	Percentage (%)
COCPs use		
Yes	37	18.5
No	163	81.5
Coitarche		
< 20	85	42.5
≥ 20	115	57.5
Number of sexual partners		
One		
>1	109	54.5
	91	45.5
Previous pap smear		
Yes	61	30.5
No	139	69.5
Information on Pap smear		
Friends	10	5
Health care provider	165	82.5
Media	20	10
Others	5	2.5

TABLE 2 below shows the gynaecologic variables of the study population and it can be seen that only 18.5% have taken combined oral contraceptive pills (COCPs) either in the past or at present while 81.5% have not used this as a form of contraception.

Also in this **TABLE 2**, 42.5% had their first sexual intercourse (coitarche) before 20 years of age and 45.5% admitted to having multiple sexual partners

Only 30.5% of this study population has undergone cervical cancer screening using Pap smear before while 69.5% were having the screening for the first time. It is found out that 82.5 % got the information on cervical cancer screening from their healthcare providers.

Table 3: Prevalence of Pap Smear

Pap smear	Number	Percentage (%)
Positive	19	9.5
Negative	181	90.5
Total	200	100.0

Table 4: Types of Pap Smear for the Study Population

Types	Number(n = 200)	Percentage (%)
AGUS	1	0.5
ASC-H	4	2.0
ASC-US	9	4.5
HSIL	3	1.5
LSIL	2	1.0
Negative	181	90.5

TABLE 4 shows the various types of abnormal Pap smears seen in this study. It is shown that the commonly seen Pap smear abnormality is Atypical Squamous Cells of Undermined Significance (ASC-US) which made up 4.5% of the study population followed by Atypical Squamous Cells in which high grade could not be excluded(ASC-H) (2.0%). High Grade Intraepithelial Lesion(HSIL), Low Grade Intraepithelial Lesion(LSIL) and Atypical Glandular Cells of Undetermined Significance(AGUS) followed closely with 1.5%, 1.0% and 0.5% respectively.

Table 5: Association Between Pap Smear Results and Different Variables of the Study Population

Variables		Status pap smear		P
		Abnormal N(%)	Normal N(%)	
Age group	20-29	7(15.6)	38(84.4)	0.004
	30-39	10(14.9)	57(85.1)	
	40-49	2(3.5)	55(96.5)	
	≥50	0(0.0)	31(100.0)	
Marital status	Single	0(0.0)	7(100.0)	0.766
	Married	16(9.5)	153(90.5)	
	Divorced	1(16.7)	5(83.3)	
	Widowed	2(11.1)	16(88.9)	
Educational level	None	3(16.7)	15(83.3)	0.168
	Primary	5(19.2)	21(80.8)	
	Secondary	5(7.5)	62(92.5)	
	Tertiary	6(6.7)	83(93.3)	
Alcohol consumption	Yes	1(4.5)	21(95.5)	0.401
	No	18(10.1)	160(89.9)	

| *HIV status* | Positive | 7(50.0) | 7(50.0) | 0.000 |
| | Negative | 12(6.5) | 174(93.5) | |

Table 5: Cont.

Variables		Status pap smear		P
		Abnormal	Normal	
		N(%)	N(%)	
Parity	0	1(4.0)	24(96.0)	0.100
	1	0(0.0)	30(100.0)	
	2-4	8(10.4)	69(89.6)	
	>4	10(14.7)	58(85.3)	
COCPs use	Yes	7(18.9)	30(81.1)	0.030
	No	12(7.4)	151(92.6)	
Coitache	< 20	16(18.8)	69(81.2)	0.000
	≥ 20	3(2.6)	112(97.4)	
Number of sex partners	1	4(3.7)	105(96.3)	0.002
	>1	15(16.5)	76(83.5)	

TABLE 5 below shows the relationship between the various variables and cervical cytology findings. It shows there is statistically significant relationship between early age at first intercourse (p=0.000), HIV status (p=0.000), age (p=0.004), number of sexual partners (0.002) and COCP usage (p=0.030), while there is no statistically significant relationship between marital status (p=0.766), educational level (p=0.168), alcohol consumption (p=0.401), and parity (0.100) and Pap smear results.

XI.   Discussion

This study showed that majority of the women who presented for cervical cancer screening in this centre were between the ages of 30-39years (33.5%) but the highest proportion of abnormal cytology was found in the age group of 20-29 years. This may be because most HPV infection is said to be acquired in the very young[18] and cytologically diagnosed intraepithelial lesions is also common in them which has a very high rate of spontaneous regression though, and for that reason the risk of invasive cervical cancer is very low in this age group[18,23].

Majority of the study population had tertiary level of education (55.5%) followed by secondary level (33.5%). This showed the importance of educational attainment to the acceptability of cervical screening which is very important in the prevention of invasive cancer of the cervix. However, even those with no formal education accepted cervical cancer screening in this study which is an indication that women are ready to accept screening irrespective of their educational status if given the opportunity[23,31,32].
About 7.0% of the screened population were either known HIV positive patients or were screened positive. This high number could be because their HIV status might have influenced the decision to send them for cervical cancer screening knowing the relationship between HIV and cervical cancer[24,33,34]. Also, it is seen that 50% of samples had abnormal cytology findings. In previous studies carried out in South Africa and Italy it was shown that the prevalence of abnormal Pap smears in HIV positive women were 16.9% and 34.0%[33,34] respectively which were both lower than the findings in this study.

In the study population, only 30.5 % have had cervical cancer screening before which is lower than what is obtainable in developed world[25,32] and 82.5% got information on cervical cancer screening from their healthcare providers which indicated the importance of this group on the effectiveness of any cervical cancer screening program[35].

The prevalence of abnormal Pap smears in this study is 9.5% which agrees with the range of 7-10% reported in world[2] but is lower than the prevalence of previous studies carried out in Enugu and Nablus in the Middle East which showed 12.2 and 12.0% respectively[4,31] and higher than the findings in a study carried out in 12 hospitals in Thailand which showed a prevalence of 0.17-3.15%[21].

The commonest type of Pap smear abnormality found in this study was ASC-US which is similar with finding in a previous study[34]. However, in a retrospective study of 880 Pap smears result studied in Nepal it was found out that HSIL and LSIL were the dominant types[35]. This variation could be due to the difference in sample size or the peculiarity of the population studied.

In this study, some of the possible risk factors for cervical cancer were explored and was found out that there is strong association between age of patient, HIV status, combined oral contraceptive pill use, early age at first sexual intercourse and multiple sexual partners and abnormal cytology on Pap smears while there was no statistically significant relationship between alcohol consumption, parity, educational status and marital status and abnormal cytology findings in the study sample.

Many studies have demonstrated the association between multiple sexual partners and early age at first sexual intercourse and the development of premalignant and malignant lesions of the cervix[32,35] and this study has also confirmed this relationship. However, this study has not shown any statistically significant relationship between the multiparity and abnormal cervical cytology even though it has being proven in some studies in the western world that there is a strong relationship[28]. In another study carried out in the Middle East with similar sample size, there was no statistically significant relationship between the various risk factors for cervical cancer and abnormal Pap smear[31] contrary to the findings in this study.

It has being shown in other studies that long term use of oral contraceptives of four years or more increases the risk of cervical cancer due to the hormonal effect even though there are conflicting findings[17] but this influence seems to be true in this study because of statistical significance between COCP use and abnormal finding seen here.

XII.   Conclusion

The summary of this study showed that the risk associated abnormal Pap smear results in this centre are age, multiple sexual partners, early age at first intercourse, HIV positive status and oral contraceptive use while marital status, parity, alcohol consumption and educational status are not related to abnormal Pap smear findings.

The prevalence of abnormal Pap smear is 9.5% and ASC-US is the commonly diagnosed abnormality while majority of patients got information on Pap smear screening from their healthcare providers and that women are willing to undergo screening irrespective of their educational status. Therefore physicians and other healthcare providers should routinely offer cervical cancer screening to their patients while other sources of information on this such as the media should be improved upon.

Acknowledgement

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