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■ Original Article

A Decade of Cervical Cancer Screening at the Jos University Teaching Hospital

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ABSTRACT

Background: Cervical cancer is the second most common cause of death from cancer in women globally. This has made its prevention and treatment an area of priority for decades, if not centuries. Despite overwhelming evidence demonstrating the effectiveness of screening programs, African countries in general, and Nigeria in particular, that bear the largest burden of cervical cancer have been unable to fully integrate cervical cancer screening exercises into their health systems. In 2007, a cervical cancer screening program was commenced at the Jos University Teaching Hospital in Jos, Plateau state Nigeria to address the screening gap and hopefully reduce the burden of cervical cancer. The aim of this review was to evaluate the cervical cancer-screening program at the Jos University Teaching Hospital, Jos, Plateau state, Nigeria, assess the challenges and effectiveness with a view to upscaling into a national programme. ***Settings and Design:*** The study was conducted in Jos, Plateau State, North Central Nigeria among women who had Papanicolaou smears, colposcopy, and biopsies done at the oncology unit of the department of Obstetrics & Gynaecology of the Jos University Teaching Hospital from 2007-2017. **Methods and Material:** This was a retrospective observational study. **Results:** Sixteen-thousand and thirty-eight (16,038) women had Papanicolaou smears over the period. Of these, 13,153(83.1%) were negative for intra-epithelial neoplasia, 1119(7.1%) showed various forms of atypical dysplasia (ASCUS, ASC-H, AGSUS), 901(5.7%) were Low-grade squamous intra-epithelial lesions (LGSIL), 332(2.1%) were high-grade intra-epithelial lesions (HGSIL) and 318(2.0%) had other findings. There were 457 histologically diagnosed cancers in the 10 years since the screening program commenced, of which squamous cell carcinoma (82.3%) was the most common histologic diagnosis. **Conclusions:** Though many women have been integrated into the cervical cancer-

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screening program of the Jos University Teaching Hospital it still covers just a minor proportion of the over-all population in the state

Keywords: Cervical cancer Screening, Jos University Teaching Hospital.

Introduction

Cervical cancer is the second most common cause of death from cancer in women globally and remains of significant public health concern. This has made its prevention and treatment an area of priority for researchers. For the past 30 years, there has been more than 50% decline in the incidence of global cervical cancer, and near elimination in some parts of the developed world.[1,2] However, a significant setback to this great stride occurs in the developing countries, which currently account for up to 80% of all cervical cancer deaths.[1] Nigeria, in particular, still has significant burden of cervical cancer deaths.[2]

This global decline in cervical cancer rate has been largely attributed to organized cervical cancer screening programs, as well as vaccination programs in recent times. The Pap test, when combined with a regular program of screening and appropriate follow-up, can reduce cervical cancer deaths by up to 80%.[3,4]

Despite overwhelming evidence demonstrating the effectiveness of screening programs, African countries that bear the largest burden of cervical cancer have been unable to fully integrate cervical cancer screening exercises into their health systems, because of the fragile health system in our countries.

Nigeria does not have a population based national cervical cancer screening program, though there have been some isolated efforts at cervical cancer screening over the years.[5] One of such is the Society for Family Health, in collaboration with the Bill and Melinda Gates foundation, and the University College Hospital Ibadan, among others.[6]

In 2007, a cervical cancer-screening program was commenced at the Jos University Teaching Hospital through the Exxon-Mobil funded Operation Stop Cervical Cancer project. This was done using the integrated approach of Papanicolaou smear, colposcopy with or without biopsy, and cryotherapy. Despite this active screening program, work done in the same hospital showed that only 19% of female health care workers had a Pap smear done.[7] Similar results were found amongst women attending a gynaecological clinic in south-eastern Nigeria with only 7.6% of women having had a Pap smear in their entire lives despite its availability, with only 8% of the women even aware of the test itself.[8]

The Papanicolaou smear has been the main stay for cervical cancer screening in over three quarters of a century. Newer and better techniques such as the liquid-based method, HPV testing, as well as gene testinghave since emerged. [9,10,11]

Another strategy for reduction of the burden of cervical cancer is the use of the HPV vaccine, which include the Cervarix and Gardasil, and recently, the nona-vaccine. This prevention option is recommended by the World Health Organization for use in all countries as part of routine vaccination.[12] However, this is yet to be included in the Nigerian Extended Program on Immunization. Also, evaluation of the particular serotypes of HPV that are more common in our environment is still ongoing, as the HPV vaccines protect against the serotypes predominant in the western world where the studies were done. For the moment, prevention by screening remains the mainstay of cervical cancer prevention strategy in Nigeria.

This study aims to evaluate the cervical cancer-screening program in the Jos University Teaching Hospital since its inception in 2007to 2017

Methods

- ***Study Area:*** The study was conducted at the Jos University Teaching Hospital (JUTH), Jos, Plateau State, North Central Nigeria. The state has boundaries with states of Bauchi in the

northeast, Taraba, southeast, Nasarawa, southwest, and Kaduna in the northwest It has an area of 26,899 square kilometers and administratively divided into 17 Local Government Areas (LGAs). The population of the state from the 2006 census was 1,598,998 males and 1,607,533 females.[13]

- ***Study Design:*** It was a retrospective observational study

- ***Study Population:*** It was carried out among all women who had Papanicolaou smears done at the oncology unit of the department of Obstetrics & Gynaecology of Jos University Teaching Hospital (JUTH) from 2007-2017.

- ***Data Collection:*** The required data was obtained from the database of the Oncology unit of the Department of Obstetrics & Gynaecologyof JUTH, Jos. Repeat smears were analyzed independently.
- ***Data Analysis:*** Analysis was done using Microsoft Excel 16.0.

Results

Sixteen thousand and thirty-eight (16,038) women had Papanicolaou smears over the study period (2007- 2017). Two hundred and fifteen of the results were not available.

The mean age was 39.14 ± 9.9, and median was 37, with a range of 13 to 90 years. Eleven thousand one hundred and ninety-seven (83.2%) were Christians, 2,193(16.3%) were Muslims and 67(0.5%) identified with other religious beliefs, including African traditional religions and Jews (See Table 1).

Twelve thousand and ninety-three (75.4%) reside in Jos whilst 3,945(24.6%) came from other states/regions. Table 1 shows the occupation of the patients. The women were of varying parities as seen in Table 1, with the most frequent being 3. Seven thousand four hundred and sixty-eight (76.7%) were multiparous and 3,008 (22.5%) were grand-multiparous.

There were 81(0.6%) smokers and 13,164 (97.8%) non-smokers with 212(1.6%) not stating their smoking habits. Eight (0.1%) women had no previous sexual partners, 5621(41.8%) had one previous sexual partner, 2178(16.2%) had 2 partners in their life-time, 3217(23.9%) had 3 or more previous sexual partners and 2433(18.0%) did not respond to the question. Four hundred and forty-seven (3.4%) of the women had early coitarche (Coitarche before age 15).

Of all smears done 13,153(83.1%) were negative for intra-epithelial neoplasia, 1,119 (7.1%) showed various forms of atypical dysplasia (ASCUS, ASC-H, AGSUS), 901(5.7%) were Low-grade squamous intra-epithelial lesions (LGSIL), 332(2.1%) were high-grade intra-epithelial lesions (HGSIL) and 318(2.0%) had other findings which included inflammatory changes, bacterial infections, trichomoniasis, fungal infections etc.

There were 850 biopsies done over the study period, which routinely were colposcopy guided biopsies. Two-hundred and one (23.6%) were cervical intra-epithelial neoplasia, 534(62.8%) were squamous cell carcinomas, 51(6.0%) adeno-carcinomas, 10(1.2%) adeno-squamous carcinomas and 54(6.4%) were other findings which included leiomyoma uteri, embryonal rhabdomyosarcoma, teratoma, inflammatory polyp, Kaposi sarcoma, metastatic Choriocarcinoma and Non-Hodgkin's lymphoma.

Table 1. Sociodemographic Characteristics

Occupation	Frequency	Percent
House Wife	2,283	17.0
Civil Servant	3,207	23.7
Health Worker	451	3.4
Trader	2,593	19.3
Farmer	611	4.5
Other Professionals	238	1.7
Semi-Skilled Worker	1996	14.7
Others	2124	15.7
Total	13, 457	100
Religion		
Christianity	11, 197	83.2
Islam	2, 193	16.3
Others	67	0.5
Total	13, 457	100
Parity		
0	960	7.1
1	1, 309	9.7
2	1, 429	10.6
3	1, 581	11.7
4	1, 450	10.8
5	1, 052	7.8
6 or more	1, 956	14.7
Unlisted	1458	27.6
Total	13, 457	100
Smoking		
Smokers	81	0.6
Non-smokers	13, 164	97.8
Not Stated	212	1.6
Total	13, 457	100
Lifetime sexual partners		
0	8	0.1
1	5, 621	41.8
2	2, 178	16.2
3 or more	3, 217	23.9
No response	2, 433	18.0
Total	13, 457	100

Table 2. Frequency of Papanicolaou smear cytology results amongst different age groups

	Cytology Result (%)					
Age	**Negative**	**Atypia**	**LGSIL**	**HGSIL**	**Others**	**Total**
≤20	147(96.1)	0(0.0)	3(2.0)	1(0.7)	2(1.3)	153(100.0)
21-30	3191(92.8)	91(2.6)	52(1.5)	16(0.5)	88(2.6)	3438(100.0)
31-40	4996(89.0)	232(4.1)	202(3.6)	80(1.4)	103(1.8)	5613(100.0)
41-50	3577(79.7)	415(9.3)	320(7.1)	98(2.2)	76(1.7)	4486(100.0)
51-60	1028(60.1)	297(17.4)	241(14.1)	110(6.4)	35(2.0)	1711(100.0)
61-70	190(50.5)	79(21.0)	73(19.4)	23(6.1)	11(2.9)	376(100.0)
>70	24(52.2)	5(10.9)	10(21.7)	4(8.7)	3(6.5)	46(100.0)
	13,153(83.1)	1,119(7.1)	901(5.7)	332(2.1)	318(2.0)	15,823(100.0)

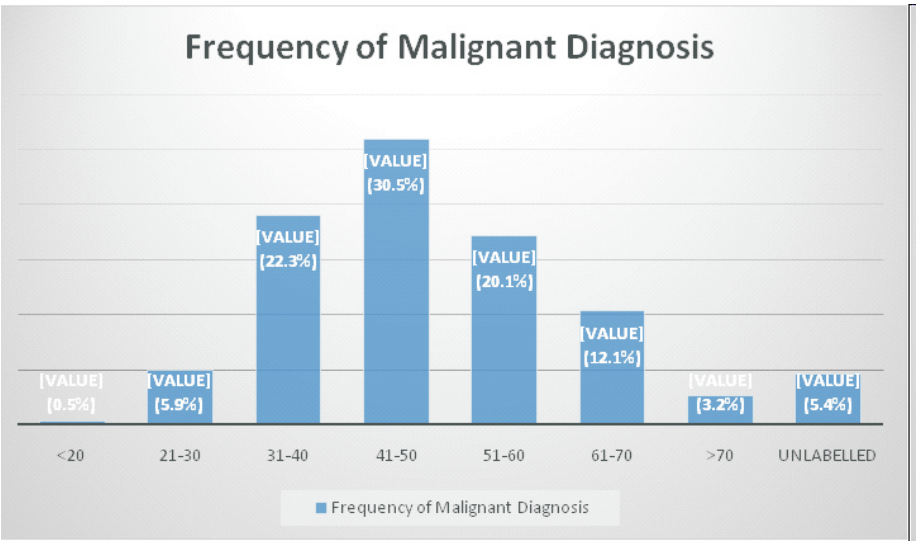

Figure 1. Frequency of histologically diagnosed neoplasia in different age groups

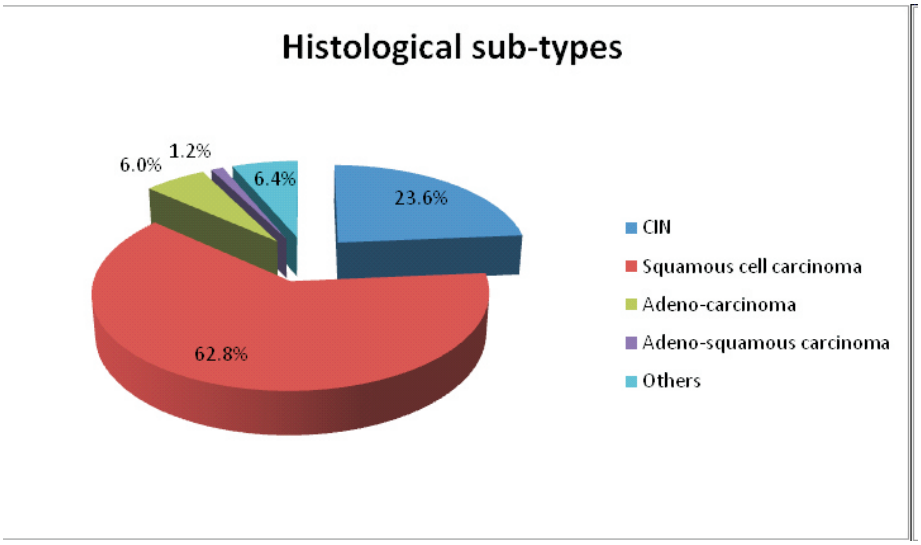

Figure 2. Proportion of the different histologic findings on biopsy

Discussion

The 16,038 Papanicolaou smears appears to be a large number done over 10 years. It is however only 1604 screens per annum with the trend of screening in most years averaging around that number, and this only represents 1% of the estimated female population of Plateau state put at 1,607,533.[13] The implication is that for every woman screened, 99 more have not benefitted. Even less so, since some of these women might have had repeat smears.

Since the Jos University Teaching Hospital runs the largest screening program in the state, it is reasonable to postulate that the vast majority of women in the state were not screened. This is in keeping with earlier studies in Jos and South-eastern Nigeria that showed low uptake of Pap smear programs in the population.[7,8]

Of the screened women, 83.2% were Christians and only 16.3% were Muslims. The proportion of Christians is more than the 70-80% Christian population in the state[14] meaning that women of the Christian faith were more likely to have a Papanicolaou smear done than their counterparts of the Muslim faith. The majority (75.4%) of the women screened resided in Jos as would be expected for such a program. There were a wide variety of occupations among the women screened. Of note was that there were only 451 (2.8%) health care workers screened over the 10-year period. This was significantly less than the female health workers in JUTH alone, in line with a previous study done on Pap smear uptake among health workers in the same facility.

The uptake is worrisomely low considering that 76.7% of the women were multiparous and as much as 30.9% were grand-multiparous, putting the population at increased risk for cervical cancer 11. Other high-risk groups were, 2 previous sexual partners (16.2%), 3 or more previous partners (23.9%), early coitarche (3.4%),[15] and smokers (0.6%). All these present a large proportion of the population at increased risk of cervical cancer.

In view of these high-risk categories and low uptake of Papanicolaou smear testing it is clear that barriers to the uptake of these test needs to be overcome. From the work done in South-Eastern Nigeria, it was evident that most of the women were unaware of the screening test in the first place, but most of those who were aware of it had a Pap smear done.[8] This means that education and awareness exercises in the general population can

significantly improve uptake of this test. However, in the study done in Jos, amongst health workers, despite the assumed awareness of the Paps smear, the uptake remained low.[7] This means that awareness alone might not be sufficient, thus, opportunistic screening for every woman presenting in a health facility in addition to increasing awareness would be a good overall strategy.

Of the smears done, 13,153 (83.1%) were negative for intra-epithelial lesion, which is similar to other African studies,[16,17,18] but more than (though not statistically significant p: 0.036) the 74.5% earlier reported in Jos[19] and lower than the average in the western world.[16,17] The increased percentage of screened women may be due to increased awareness by the public.

One thousand and nineteen (1019) results showed some atypical findings, ranging from Atypical Squamous Cell of Undetermined significance (ASCUS), Atypical Glandular Cells of Undetermined Significance (AGCUS) and Atypical Squamous Cells Where High-grade lesions cannot be excluded (ASC-H). This puts the percentage for Atypia at 7.1%, which, is lower than the findings from a previous study from this Centre done 5 years earlier[19] and may suggest a possible decrease in the incidence due to earlier screening. This means that the screening program may have been able to reduce the prevalence of atypical findings which are often the precursors for cervical malignancies. There were 901 cases of Low-gradesquamous intra-epithelial lesions (LGSIL) and 332 cases of high-grade squamous intra-epithelial lesions(HGSIL). This is understandable, given that LGSIL sometimes resolves and a proportion of them progress to HGSIL.[10] All these rates were higher than those in works from the developed countries,[18] believed to be due to poor screening attitudes, and practice in this part of the world.[19] The implication of this, similar to that for atypia further buttresses the effects cervical cancer screening has on identifying premalignant lesions of the cervix, preventing advancement to higher grade lesions and ultimately reducing the incidence and burden of cervical cancer in any given population.

Of note is that the prevalence of abnormal smears was directly proportional to the age of the women up to age 70, as illustrated in Table 2, which further buttresses the fact that there is an increase in the risk of developing pre-malignant and malignant diseases of the cervix with advancing age. It also supports the screening programs that suggest screening between the ages of 21-65,[20] because as seen in this review, the risk of developing cervical neoplasia particularly after a previous normal result is low.[20]

There were 457 histologically diagnosed cancers in the 10 years since the screening program commenced. The most frequently affected age group was 41-50 years as illustrated in figure 1. This is 5 years later than to those from the American Cancer society, which states that Cervical Cancer occurs most frequently between the ages of 35 and 44.[21] Only 2.8% of cancer diagnoses were made in those above 70 years of age, this is in line with previous works that show that carcinoma of the cervix is infrequent above 65years[21] and explains why the screening programs for pre-invasive lesions usually end at that age.[10]

Among those with malignancy, squamous cell (82.3%) carcinoma was the most common histologic diagnosis, which agrees with previous reports as the most commonly occurring histologic type of cervical cancer.[22] This was followed by adeno-carcinoma, adeno-squamous carcinoma and then others, and shows that the pattern of cervical cancer is similar in this environment to other parts of the world.[11,22]

Conclusion

This work has demonstrated that though a large number of women have been integrated into the cervical cancer-screening program of the Jos University Teaching Hospital it still covers just a minor proportion of the over-all population at risk.

It is there clear that a huge number of women were not having Papanicolaou smears done despite the presence of significant risk factors.

It has also demonstrated other known similarities such as an increasing incidence of

abnormal pap smears with advancing age and the pre-dominant histologic type of squamous cell carcinoma of the cervix.

We therefore recommend that more effort be directed towards encouraging women to enroll into the cervical cancer screening program through awareness creation, reduction of cost of screening, policy development and enforcement of vaccination against HPV. On a hospital level it needs to be emphasized as a policy that every woman between the ages of 21 and 65 presenting to all clinics, be encouraged totake a Pap smear, irrespective of the complaints she presents with, unless she had one done in the past 2 years.

Lastly, this program needs to be expanded to the Primary Health Care level for a wider reach, and where facilities are lacking, there remains room for Visual Inspection with Acetic Acid (VIA) which can also go a long way to reducing the burden of this disease.

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