Acceptability and Validity of HPV Self-Sampling for Cervical Cancer Screening among Women Living With and Without HIV In Lagos University Teaching Hospital, Nigeria

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Extended Abstract

Introduction: Human Papillomavirus (HPV) has been established as the necessary cause of cervical cancer which is a major cause of mortality among women.[1,2,3] Women with HIV infection have higher prevalence of HPV infection and are more likely than women in the general population to be infected with high risk genotypes with greater potential of progression to cervical cancer as a result of their reduced immunity.[4,5] In 2020, the World Health Organization (WHO) launched a global initiative to eliminate cervical cancer as a public health problem during the 21st century and recommended HPV screening for the prevention of cervical cancer. WHO recommends cervical cancer screening to all women living with HIV through molecular HPV testing. [6] HPV tests have proven more sensitive, reproducible and to allow for safer extended screening intervals than conventional cervical cancer screening tests. HPV testing is less dependent on operator expertise than the conventional tests, making it more suitable for resource-constrained settings. Moreover, HPV testing can be performed on vaginal samples collected by the woman herself which is known as self-sampling. Studies have shown comparable diagnostic accuracy of self-collected and clinician collected HPV genital samples.[7, 8] Self-sampling is a safe and easy approach increasing the opportunities of reaching women that otherwise would not participate in a clinician-based screening or facilitate their access to a screening test. WHO recommends primary HPV based screening and include self-sampling among the recently published guidelines on self-care intervention.[9] To allow successful integration of HPV self-sampling into national screening programmes, it is necessary to understand the acceptability and validity of this method of sampling the cervix among women living with and without HIV in the general population.

Objectives: The aim of this study was to assess and compare the awareness and knowledge of HPV, cervical cancer and HPV self-sampling method as well as acceptability of HPV self-sampling method among women living with and without HIV in Lagos University Teaching Hospital (LUTH) in Lagos, Nigeria. This study also compared the level of agreement (validity) of HPV DNA results between the self-collected and clinician-collected sampling methods among the study population.

Methods: A comparative cross-sectional study was conducted among women attending AIDS Prevention Initiative in Nigeria (APIN) clinic and General Outpatient Department of LUTH, Nigeria and participants were selected using a systematic sampling technique. Data were collected using a semi-structured interviewer-administered questionnaire and analyzed using Statistical Package for Social Sciences (SPSS). Chi-square statistics was used to test association between

categorical outcome variables in the two groups. Student t-test was used to compare the mean difference scores between the independent variables. For sample collection, Hybribio Female Sample Collection Kit was used by the clinician and the women. HPV serotyping involved DNA extraction, PCR amplification, flow-through hybridization and result interpretation. The level of agreement between the two collection methods was determined using Kappa statistics to determine the level of chance agreement between the self-collected and clinician-collected (Gold Standard) samples. The level of significance was set at $p<0.05$.

Results: The mean age of the respondents was 42.4 years ± 7.3SD and 64.8% were married.

Awareness of HPV was low (32.2%) and this was significantly lower among women living with HIV (16.9%) than women living without HIV (50.6%). (Table 1)

Table 1: Comparison of the awareness of HPV infection, cervical cancer and the screening methods among the respondents by HIV status

Variable	Women living with HIV n=290 Freq. (%)	Women living without HIV n=241 Freq. (%)	Total n=531 Freq. (%)	Chi square χ^2	p value
Ever heard of cervical cancer					
Yes	168 (57.9)	181 (75.1)	349 (65.7)	17.230	<0.0001 †
No	122 (42.1)	60 (24.9)	182 (34.3)		
Ever heard of HPV infection					
Yes	49 (16.9)	122 (50.6)	171 (32.2)	68.570	<0.0001 †
No	241 (83.1)	119 (49.4)	360 (67.8)		
Ever heard of screening methods for cervical cancer and HPV infections					
Yes	85 (29.3)	112 (46.5)	197 (37.1)	16.614	<0.0001 †
No	205 (70.7)	129 (53.5)	334 (62.9)		

† Statistical significant

The overall knowledge of HPV infection was low (18.5%) and this was significantly lower among women living with HIV (7.2%) than women living without HIV (32.0%). (Table 2)

Table 2: Comparison of overall knowledge of HPV infection among the respondents by HIV status

Variable	Women living with HIV n=290 Freq. (%)	Women living without HIV n=241 Freq. (%)	Total n=531 Freq. (%)	Chi square χ^2	p value
Overall knowledge of HPV infection					
Good Knowledge	21 (7.2)	77 (32.0)	98 (18.5)	53.395	<0.0001 †
Poor Knowledge	269 (92.8)	164 (68.0)	433 (81.5)		
Mean knowledge score ± SD	1.67 ± 3.95	5.83 ± 6.45	3.56 ± 5.63	9.127*	<0.0001 †

† Statistical significant, *T-Test

However after a brief information on HPV and cervical cancer, a significantly higher proportion of women living with HIV (93.1%) compared to women without HIV (87.1%) accepted HPV self-sampling method for collection of genital samples ($p<0.0001$). (Table 3)

Table 3: Comparison of acceptability of self-sampling method for the collection of genital HPV sample among the respondents by HIV status

Variable	Women living with HIV n=290 Freq. (%)	Women living without HIV n=241 Freq. (%)	Total n=531 Freq. (%)	Chi square χ^2	p value
Acceptability to self-collect the HPV genital sample in the clinic					
Yes	270 (93.1)	210 (87.1)	480 (90.4)	5.397	0.020 †
No	20 (6.9)	31 (12.9)	51 (9.6)		

† Statistical significant

Awareness of HPV was significantly associated with the acceptance of HPV self-sampling method for the collection of genital samples.

HPV self-sampling method was valid when compared to the clinician-collected genital samples. Self-collected genital samples shows very high sensitivity, predictive values and diagnostic accuracy when compared with the clinician-collected genital samples (which is the gold standard) for the detection of any HPV and high-risk HPV infections (Table 4).

Table 4: Summary of the validity of self-collected sampling method against clinician-collected sampling method for the detection of HPV infections by HIV status

Variable	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Positive Likelihood Ratio	Negative Likelihood Ratio	Diagnostic Accuracy
Any HPV DNA							
Women living with HIV	100.0%	89.8%	88.9%	100.0%	9.8	0.00	94.4%%
Women living without HIV	100.0%	92.3%	75.9%	100.0%	13.0	0.00	93.8%
Any High Risk HPV DNA							
Women living with HIV	100.0%	92.0%	89.6%	100.0%	12.5	0.00	95.3%
Women living without HIV	100.0%	94.9%	79.1%	100.0%	19.6	0.00	95.7%

Conclusion and implications: Acceptability of HPV testing for cervical cancer screening using self-collected genital samples and timely follow-up care has the potential to improve the prevention of cervical cancer among women, especially women living with HIV. Acceptance of HPV self-sampling method for early detection of high-risk genital HPV infection and prevention of cervical cancer especially among women living with HIV can be achieved by increasing the awareness about HPV and HPV self-sampling method for the collection of genital samples which is easy and convenient. HPV self-sampling method was also valid when compared to the clinician-collected genital samples. There is a need to increase the awareness about HPV and HPV self-sampling method for the collection of genital samples for the prevention of cervical cancer.

We can eliminate cervical cancer as a public health problem if we match the power of the tools we have with unrelenting determination to scale up their use globally.

Keywords: HPV, Self-collected sampling, Acceptability, Validity, HIV, women, Nigeria

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