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## Human Papilloma Virus Vaccine Awareness and Vaccination History in Patients Attending STI Clinics in Lagos and Ibadan, Nigeria

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### Abstract

HPV is one of the most common causes of sexually transmitted disease in both men and women worldwide. It is transmitted through vaginal, anal, and oral sex. This study provided information on the Human Papilloma Virus (HPV) vaccine awareness and vaccination history in relation to the level of antibodies to (HPV) in the population at risk in Nigeria. Patients attending STI clinics at Lagos and Ibadan were recruited and informed consent was obtained from all the participants. Using semi structured questionnaire, vaccination history, demography and past experiences of the patients were obtained. Whole blood samples were obtained and the sera screened for specific antibodies to HPV using ELISA test kits for determination of IgG to HPV by DIA PRO Diagnostic Bioprobes Milano-Italy according to the manufacturer's instruction. Of the 170 samples analysed 50 (29.4%) samples were positive for HPV. Thirty (17.6%) were from females and 20 (11.7%) of them were males. Thirty-five (35%) of the 100 women participants were aware of HPV vaccine. 15(15%) women did not take the vaccine because they did not know where to get it while 20 (20%) of them could not afford it. It was also noted that there is higher prevalence among the middle-aged women. A high prevalence of HPV antibodies was observed in the study yet none of the participants had received the HPV vaccine thus the antibodies may be from infection. Implication is that the 30 women who tested positive for the HPV antibodies may be at risk of cervical cancer.

### Keywords

WHO quality of life BREF; Adolescents; Structural analyses; Confirmatory factor analysis

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## INTRODUCTION

Human Papilloma Virus (HPV) is one of the viruses of the papillomavirus family that comprises of nonenveloped, epitheliotropic DNA viruses that induce benign lesions of the skin (warts) and mucous membranes (condylomas). Some papillomaviruses have also been implicated in the development of epithelial malignancies including cancer of the cervix and other tumors of the urogenital tract (Howley *et al.*, 2007). To date, over 120 genotypes of HPV has been identified of which at least 35 types are sexually transmitted (Abreu *et al.*, 2012).

HPV infection of the anogenital tract represents the most important medical burden of the group of viruses. HPV infections affect the genital skin and mucosa, including the vaginal tract, cervix and anal canal and most of these infections are sexually transmitted. HPV is transmitted through genital contact, most often during vaginal, oral and anal sex. HPV is one of the most common causes of sexually transmitted viral disease in both men and women worldwide (Burd E. M., 2003). Estimates from different places suggest that about 83% of sexually active women will eventually become infected with HPV overtime (Munoz *et al.*, 2003 and Smith *et al.*, 2007).

Most of the young women infected with HPV are able to clear the virus and the infection is usually temporary with little long-term effect. Nevertheless, the infection persists in five to ten percent of infected women and this leads to a high risk of developing cancer of the cervix. Epidemiological studies have shown that infection with specific types of HPV with its DNA integrated in the cervical cells is a precursor to development of invasive cervical cancer (Hwang *et al.*, 2002). In addition, specific HPV DNA can be identified in over 90% of invasive cervical cancers (Walboomers *et al.*, 1999).

Some sexually transmitted HPV types have been categorised into high risk and low risk subgroups based on their relative risk potential to induce invasive cancer (Thomas *et al.*, 2006). HPV genotypes 16, 18, 26, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68, 70, 73 and 82 are defined as high risk groups (Cogliano *et al.*, 2005 and Thomas *et al.*, 2006) while genotypes 26, 42, 44, 54, 61, 70, 72 and 81 are defined as the low risk group (de Villiers *et al.*, 2004).

There are two vaccines available for prevention of some HPV infection in Nigeria. They are Gardasil which is marketed by Merk, and it protects against infection of HPV types 6, 11, 16 and 18, while Cervirex marketed by GlaxoSmithKline which prevents infection of HPV types 16 and 18 is available for sale over the counter and not through any government programme. Although these vaccines are quite effective they do not have any therapeutic effect on existing HPV infections or cervical lesions (Markowitz *et al.*, 2007).

This study investigated Human Papilloma Virus (HPV) vaccine awareness and vaccination history in relation to the level of antibodies to HPV in the population at risk.

## MATERIALS AND METHODS

The study involves 170 patients attending STI clinics at Lagos and Ibadan. One hundred and six patients were recruited from Ibadan and 64 patients were recruited from Lagos. Informed consent was obtained from all the participants of this study. With the aid of semi structured questionnaire, vaccination history, demography and past experiences of the patients were obtained. Ethical approval for this study was obtained from Nigeria institute of medical research (NIMR) ethics board.

### Sample collection and Processing

About 5ml of blood was collected from each of the consented participants into sterile EDTA bottles and transported into the laboratory in a cold box with ice packs to maintain cold chain. Plasma was separated from the samples by centrifugation at 500g for 5 minutes and stored in sterile cryovials at  $-200\text{C}$  until processing.

### Analysis

ELISA test kits by DIAPRO Diagnostics Bioprobes Milano-Italy were used to tests for HPV IgG antibodies according to the manufacturer's instruction with each plate having its own controls. The optical density of the wells was read by an ELISA reader manufactured by BioTek Instrument INC USA and the results were calculated according to the ELISA kits manufacturer's instruction. The samples with equivocal results were retested and those that were still equivocal after retesting were regarded as negative. The ELISA test kit was designed to detect IgG antibodies to HPV types 6, 11, 16 and 18. All the data obtained were analysed using SPSS 14.0 software.

## RESULTS

One hundred and seventy participants were recruited for the study. Of this, 100 (58.8%) were females while 70 (41.2%) were males. Their age ranged from 21-70 years. Mean age was 33 with a standard deviation of 9.0. Seventy (41.2%) of the study population were in the age group of 31-40. Sixty (60%) of female and 35 (50%) of the male were married while 65 (38.2%) had tertiary education.

A total of 170 samples were tested for HPV IgG antibodies of these, 50 (29.4%) were positive. Among the positive samples, 30 (60%) were from women while 20 (40%) were from men. Of the 100 females tested 30 (30%) had anti HPV IgG antibodies compared with twenty (28.6%) of males. Table 1 below shows socio-demographic data and distribution of anti HPV IgG antibodies among the study population. Females seem to have a higher percentage of positivity than males even though the difference is not significant statistically ( $P = 0.91$ ). Also women aged 31 to 40 years had a higher percentage of positivity to HPV IgG antibodies compared with those in the age bracket 51-60 years although the difference is not statistically significant ( $P = 0.16$ ). In addition women with tertiary education had the highest percentage of HPV IgG positivity compared with those with none ( $P = 0.5$ ).

Fig 1 shows the level of awareness, accessibility and affordability of HPV vaccine to women attending STI clinics in Lagos and Ibadan. Thirty five percent of the women were aware of

HPV vaccine. Of the 35 women who were aware of the vaccine 20 (57.1%) could access the vaccine while 15 (42.9%) could afford the vaccine.

## DISCUSSION

This study provided information on the prevalence of HPV infection, as well as its gender and age distribution and marital status among patients attending STI clinics in Lagos and Ibadan Nigeria. It also showed the level of awareness, accessibility and affordability of HPV vaccine among women in the study population.

The overall prevalence of anti HPV IgG antibodies of 29.4% found in this study shows that HPV infection is quite common among patients attending STI clinics in Nigeria supporting the fact that HPV infection is among the commonest sexually transmitted infections. The high prevalence found among women in this study is higher than what was observed in previous study by Vaccarella *et al.*, 2010 where they found about 25% of Nigerian women screened to have IgG antibodies HPV 16 and 18. This higher prevalence could be because the study was conducted among high risk population STI clinic attendees.

It was observed in this study that women within the age group of 31-40 years had the highest prevalence (40%). This result is different from what was observed by Adekunle *et al.*, 2014 where they found highest prevalence among the age group of less than 30 years. Men of the age group 31-40 also had the highest rate of seropositivity to HPV. All these information is similar to what has been observed in literature that HPV seropositivity is highest at middle age (Wang *et al.*, 2003). This is the age that people are most sexually active and HPV being sexually transmitted explains the higher prevalence at this age.

It is also important to note that people of higher education had the highest rate of seropositivity to HPV antibodies among the study population. This could be because this group of people are more enlighten thus are more likely to seek medical attention as they are the largest group in the study population. In addition married people both male and female had the highest rate of seropositivity of HPV antibodies compared to other marital status buttressing the fact that this group of people are more sexually active resulting from cohabitation. There is a low level of awareness and accessibility of HPV vaccine among women in among the female participants of this study. Only 35 (35%) are aware of the aware of the availability of the vaccine and 20 (20%) could access. The vaccine is also unaffordable to most of the women as only 15 (15%) could afford the vaccine at the current price.

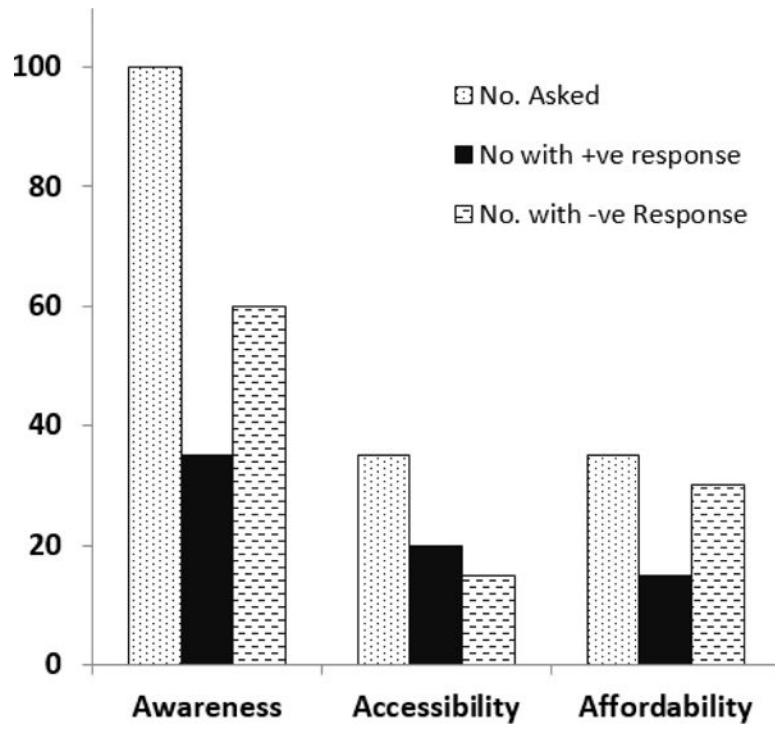
In conclusion, this study showed that there is a high prevalence of HPV among sexually active individuals in Nigeria. There is also a low level of awareness and accessibility of the vaccine among women. Most of the women could also not afford the vaccine. This information shows the need for more effort in providing information on HPV and its prevention as this will ultimately aid in prevention of cervical cancer and other HPV related cancers in Nigeria.

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## References

- Adekune S, Waidi Folorunso Sule, Oluwayely DO. High negativity of IgG antibodies against human papilloma virus type 6, 11, 16 and 18 virus-like particles in healthy women of childbearing age. *J Exp Intergr Med*. 2014; 4(1):37–41.
- Barbisan G, Perez LO, Contreras A, Golijow CD. *Tumor Biol*. 2012; 33:1549.doi: 10.1007/s13277-012-0408-1
- Cogliano V, et al. Carcinogenicity of human papillomaviruses. *Lancet Oncology*. 2005; 6(4):204. [PubMed: 15830458]
- de Villiers EM, Fauquet C, Broker TR, Bernard HU, zur Hausen H. Classification of papillomaviruses: *Virology*. 2004; 324:17–27.
- de Sanjosé S, Diaz M, Castellsagué X, Clifford G, Bruni L, Muñoz N, Bosch FX. Worldwide prevalence and genotype distribution of cervical human papillomavirus DNA in women with normal cytology: a meta-analysis. *Lancet Infect Dis*. 2007; 7:453–9. [PubMed: 17597569]
- Hwang SG, Lee D, Kim J, Seo T, Choe J. Human papillomavirus type 16 E7 binds to E2F1 and activates E2F1-driven transcription in a retinoblastoma protein-independent manner. *J Biol Chem*. 2002; 277(4):2923–30. [PubMed: 11713253]
- Howley PM, Lowy DR. Papillomaviruses. In: Knipe DM, Howley PM, editors *Fields Virology*. 5th. Vol. 2007. Philadelphia: Lippincott, Williams & Wilkins; 2003. 2299–2354. Burd E. M.
- Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER. Tnf- $\alpha$  and IL-10 promoter polymorphisms, HPV infection and cervical cancer risk. Recommendations of the Advisory Committee on Immunization Practices (ACIP) Quadrivalent Human Paillomavirus Vaccine. 2007. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5602a1.htm>
- Muñoz N, Bosch FX, de Sanjosé S, Herrero R, Castellsagué X, Shah KV, Snijders PJ, Meijer CJ, International Agency for Research on Cancer Multicenter Cervical Cancer Study Group. Epidemiologic classification of human papillomavirus types associated with cervical cancer. *N Engl J Med* 6. 2003; 348(6):518–27.
- Smith JS, Lindsay L, Hoots B, Keys J, Franceschi S, Winer R, Clifford GM, et al. Papillomavirus type distribution in invasive cervical cancer and high-grade cervical lesions: a meta-analysis update. *Int J Cancer* 1. 2007; 121(3):621–32.
- Walboomers JM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV, Snijders PJ, Peto J, Meijer CJ, Munoz N. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *J Pathol*. 1999; 189:12–19. [PubMed: 10451482]
- Hiller ThomasPoppelreuther SvenStubenrauch Frank. Comparative analysis of 19 genital human papillomavirus types with regard to p53 degradation, immortalization, phylogeny, and epidemiologic risk classification. *Cancer Epidemiology Biomarkers and Prevention*. 2006; 15:1262–1267. Cogliano *et al*. 2005.
- Vaccarella S, Franceschi S, Clifford GM, Touze A, Hsu CC, de Sanjose S, Anh PTH, Hieu NT, Matos E, Hai Rim Shin HR, Sukvirach S, Thomas Jo, Boursaghin L, Gaitan J, Snijders PJF, Meijer C, Munoz N, Herrero R, Pierre Couisaget P, for IARC HPV Prevalence Surveys Study Group. Seroprevalence of Antibodies against Human Papillomavirus (HPV) Types 16 and 18 in Four Continents: The International Agency for Research on Cancer HPV prevalence Surveys. *Cancer Epidemiology, Biomarkers & Prevention*. 2014; 19(9):2379–2388.9.
- Wang SS, Sciffman M, Shields TS, Herrero R, Hildesheim A, Bratti MC, Sherman ME, Rodriguez AC, Castle PE, Morales J, Alfaro M, Wright T, Chen S, Clayman B, Burk RD, Viscidi RP. Seroprevalence of human papillomavirus 18, 18, 31, and 35 in a population-based cohort of 10000 women in Costa Rica. *Br J Cancer*. 2003; 89:1248–1254. [PubMed: 14520455]



**Figure 1.** Awareness, Accessibility and Affordability of HPV vaccine to Women attending STI Clinics in Lagos and Ibadan

**Table 1**

Age Group and HPV Antibodies

Variable	Category	Number Tested	Number Positive (%)	Number Negative (%)	Chi <sup>2</sup> (P<0.05)
Age	30	64	13 (20.3)	51 (79.7)	6.02 (0.16)
	31–40	69	27 (39.9)	42 (60.9)	
	41–50	20	7 (35.0)	13 (65.0)	
	>50	5	1(20.0)	4(80.0)	
Sex	Female	100	30(30.7)	70 (69.3)	0.193 (0.91)
	Male	60	20 (28.3)	40(71.7)	
Education	Primary	15	04 (26.7)	11 (73.3%)	0.9108 (0.8228)
	Secondary	63	17 (27)	44 (73)	
	Tertiary	66	22 (32)	44 (68)	
	None	2	1 (50)	1 (50)	
Marital Status	Single	43	9 (20.9)	34 (79.9%)	7.721 (0.0521)
	Married	96	29 (30.2)	67 (69.8)	
	Widow	5	3 (60.0)	2 (40.0)	
	Single	2	2 (100)	0	