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Examining the Prevalence and Risk Factors of Genital Warts among HIV-Infected and HIV-Negative Women: A Cross-Sectional Study in Cameroon

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ABSTRACT

Background: Current research primarily focuses on high-risk strains of HPV associated with cervical cancer, overlooking risk factors for low-risk HPV infections like genital warts among vulnerable women, especially concerning their HIV serology. Understanding the interplay between genital warts, HIV status, and socio-cultural factors is crucial for informing targeted prevention to alleviate the burden of genital warts in vulnerable populations.

Aims: The purpose of this study is to determine the prevalence and risk factors of genital warts among women based on their HIV serostatus.

Materials and Methods: A cross-sectional study was conducted among women seeking gynecological consultation at a public Hospital in Cameroon. Data were collected through a survey and medical records, then analyzed using SPSS version 18.0.

Results: Among 257 women attending the hospital, 60 had genital warts, with the majority being HIV-positive (63.33%). Notably, 67% of these women sought gynecology consultation for the first time for genital warts. The location and types of genital warts were associated with HIV status, with papular genital warts being more prevalent among HIV-infected women and acuminate warts among non-infected women. Additionally, associations were found between smoking, multiple sexual partners, and genital warts among HIV-positive women. The reliance on traditional medicine or homemade remedies (85%) and the high prevalence of self-medication (75%) were also observed.

Conclusion: Addressing socio-cultural barriers is essential to enhance healthcare-seeking behaviour, facilitate early detection and treatment, and alleviate the burden of genital warts and HIV. Efforts should prioritize awareness-raising, enhancing healthcare access, and integrating traditional medicine into comprehensive healthcare systems.

Key words: Genital warts; HIV; Risk factors; Behaviour, Women

Abbreviations: VEGFR: Vascular Endothelial Growth Factor; DDR1: Discoidin Domain Receptor 1; PPAR-Peroxisome Proliferator Activated Receptor; GKRP: GlucoKinase Regulatory Protein; HPV-Human Papillomavirus; HIV-Human Immunodeficiency Virus

INTRODUCTION

Cervical cancer remains a significant public health challenge in Africa, with a high prevalence observed across the continent [1]. However, there is a notable gap in understanding the risk factors associated with low-risk HPV infections, such as genital warts, particularly among women with different HIV serostatus [2]. Genital warts are primarily caused by low-risk Human Papillomavirus (HPV) types 6 or 11, accounting for approximately 90% of cases. These warts can have a significant impact on the well-being of patients, causing psychological and psychosexual distress, and leading to anxiety [3]. The regression of genital warts depends on the patient's immunity. HPV infection is prevalent worldwide, particularly among people infected with the Human Immunodeficiency Virus (HIV) [3]. HIV is a retrovirus that attacks the Cluster of Differentiating 4 (DC4) lymphocytes, leading to AIDS (acquired immunodeficiency syndrome) and making the body more vulnerable to other diseases or viruses such as HPV [4,5]. People

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with HIV are more vulnerable to potential HPV infection, which is also one of the most prevalent sexual virus infections in Cameroon [6]. The study indicated a high prevalence of HIV in Cameroon (43.1%) among women, with 8.02 million women at risk for cervical cancer [7,8]. However, developing countries face challenges with accessibility to both HPV vaccine awareness and antiretroviral [9]. The lack of knowledge about the social determinants of health, accessibility to appropriate care, and HPV vaccination in developing countries further exacerbates the burden of HPV-related infections, including genital warts, particularly among vulnerable populations such as those living with HIV [9,10]. In addition to medical factors, socio-cultural barriers play a crucial role in shaping the prevalence and management of HPV-related conditions [11]. Stigmatization surrounding sexually transmitted infections, including HPV, is pervasive, particularly among vulnerable populations such as HIV-infected individuals [11]. This stigma can act as a barrier to seeking appropriate medical care and may contribute to the underreporting of HPV-related symptoms. Additionally, despite the significant impact of genital warts on patients' well-being, the research and attention in developing countries' healthcare systems have been focused on cervical cancer, while genital warts have been relatively understudied and overlooked [2,12]. This gap underscores the need for more comprehensive studies and awareness campaigns that encompass the broader spectrum of HPV-related conditions, including genital warts [11]. Furthermore, traditional medicine practices often prevail in women's healthcare in many African regions [13]. The reliance on traditional remedies and treatments may reflect cultural beliefs, accessibility issues, or a lack of trust in conventional healthcare systems [14]. Understanding the interplay between traditional and modern healthcare practices is essential for developing comprehensive approaches to HPV prevention and management. Given the significant importance of sociocultural factors in women's health in Africa [15], there is a need to identify exposure behaviour associated with genital warts specifically among women with varying HIV serology. Therefore, the purpose of this study is to determine the prevalence and risk factors of genital warts among women based on their HIV serostatus. By elucidating the relationship between genital warts, HIV status, and socio-cultural factors, to inform targeted prevention and management strategies to mitigate the burden of genital warts in vulnerable populations.

MATERIALS AND METHODS

The study designs

This study employed a cross-sectional design and was conducted at the gynaecological consultation service at a public hospital in the central region of Cameroon.

Data collection

The study included women aged 18 years and above diagnosed with genital warts. Consecutive non-probability sampling was utilized, with 60 out of the 257 women who received gynaecological consultations between January and October 2023 being included in the study due to their genital wart diagnosis.

Questionnaire form: A questionnaire was developed by the researchers based on recommendations and literature on HPV infections in developing countries. It focused on sociodemographic information, HIV status, location and type of genital warts, and associated behaviours and factors.

Data collection procedure

Information on HIV serology status and clinical characteristics of genital warts was obtained through a combination of medical record review and clinical examination conducted by a gynecologist. key areas, including HIV status, the location and type of genital warts, and factors associated with condyloma. Additionally, socio-demographic data, behavoir, and factors associated with the condition were gathered through patients using the developed questionnaire.

Evaluation of research data

The collected data were analyzed using SPSS version 18.0 software. Descriptive statistics such as percentages, frequencies, means, and standard deviations were utilized to analyze the data. Parametric tests, including one-way ANOVA (Analysis of Variance), and non-parametric tests, such as Kruskal-Wallis test, were employed to analyze relationships between variables.

RESULTS

Profiles of participants

The results indicate that among the 60 participants diagnosed with genital warts, the mean age was 26 years old. The age range varied from 15 to 62 years old, with the youngest participant being 15 years old and the oldest being 62 years old. Nearly half of the women fell into the age bracket of 26-30 years old (49.8%), and a majority of them were single (58.33%). Furthermore, the majority of participants had attained a university level of education (41.1%), and 88.33% reported having at least three children (Table 1).

Table 1: Socio-demographic characteristics of women.

Descriptive characteristics			
Number of children		**n**	%
	0-3	53	88.33
	04-Jul	3	5
	More than 7	4	6.66
	15-25	30	53
Age	26-30	106	49.8
	Over 31	22	10.3
	Primary	16	26.7
Education level	High school	19	31.7
	University	25	41.7
Marital status	Single	35	58.33
	Couple/boy-girlfriend	4	6.66
	Married	20	33.3
	Polygamic	1	1.66

The prevalence of genital warts among women with HIV-positive and negative

In this study, out of 257 women attending gynaecologist consultations, 60 of them (23%) were diagnosed with genital warts. Among the women with genital warts, 38 (63.33%) were HIV-positive, while 22 (36.6%) were HIV-negative (p=0.039).

Table 2 sheds light on the care and management of genital warts, focusing on the seeking behaviour among participants. The majority noticed their genital warts themselves (60%), with most of them having their first gynaecologist consultation after noticing warts (67.14%). A significant proportion had not visited a gynaecologist in over 3 months (80%). Furthermore, a considerable number used traditional medicine or homemade remedies (85%) and engaged in self-medication (75%).

Characteristic of genital warts among women with HIV-positive and negative

In terms of the localization of genital warts, a statistically significant association ($p \leq 0.05$) was observed between the vulva and vaginal sites and HIV serology (Table 3). The genital warts were predominantly localized on the vagina (60%), with the vulva being the second most common site (35%). Notably, vaginal presentation was more frequently observed among HIV-infected women (63.2%) compared to HIV-negative women (54.5%) (Table 3). Women who were HIV-negative were more likely (0.90 ± 0.31) to have condyloma on the vulvar compared to HIV-positive women (0.85 ± 0.36).

Regarding the type of genital warts, there was a statistically significant association ($p \leq 0.05$) between papule genital warts and HIV serology. Indeed, HIV-positive women were more inclined (0.9 ± 0.29) to present papule genital warts compared to non-infected women (0.21 ± 0.41). Additionally, acuminate genital warts were found to be more prevalent overall (55%). However, non-infected women exhibited a lower incidence of acuminate genital warts (52.6%) compared to the HIV-negative group (59.1%) (Table 3).

The associated factors of genital warts among the two groups

The most prevalent risk factors in the HIV-positive group were smoking (70.8%) and having multiple sexual partners (60.5%). Conversely, among women with HIV-negative status, the most common risk factors were smoking (66.7%) and early intercourse (59.1%). A statistically significant association (p=0.00) was found between smoking and HIV-positive serology as a risk factor. However, smoking was not significantly associated with negative HIV serology in women ($p>0.05$). Furthermore, there was a statistically significant association between having multiple sexual partners and being HIV-positive (Table 4).

Table 2: Genital warts care and management: Seeking behavior among women in Cameroon.

Questions	Responses n (%)
Who noticed your genital warts first?	
Self	36 (60.%)
Partner	10 (16.67%)
Doctor	14 (23.33%)
Is it your first time coming for a gynaecologist consultation since having genital warts?	
Yes	47 (67.14%)
No	23 (32.86%)
Was your last gynaecologist consultation date more than 3 months ago?	
Yes	48 (80%)
No	12 (20%)
Do you use traditional medicine or homemade remedies for your genital warts?	
Yes	51 (85%)
No	09 (15.00%)
Did you engage in self-medication upon noticing genital warts?	
Yes	45 (75%)
No	15 (25.%)

Table 3: Repartition of the characteristics of genital warts in the two groups.

Characteristics	HIV (+)	HIV (-)	45 (75%)	45 (75%)	45 (75%)
	n (%)	(mean ± SD)	n (%)	(mean ± SD)	p
localization					
Vulva	12 (31.6)	0.85 ± 0.36	9 (40.9)	0.90 ± 0.31	0.037*
Lips	1 (2.6)	0.70 ± 0.26	1 (4.5)	1.15±0.5	0.514
Anal	1 (2.6)	0.7 ± 0.26	0 (0.00)	0.1 ± 0.36	0.665
Vagina	24 ± (63.2)	0.63 ± 0.48	12 (54.5)	0.54 ± 0.5	0.017*
Type of genital warts					
Acuminate	20 (52.6)	0.52 ± 0.5	13 (59.1)	0.59 ± 0.5	0.118
Papule	8 (21.1)	0.9 ± 0.29	2 (9.10)	0.21 ± 0.41	0.014*
Flat	10 (26.30)	0.26 ± 0.44	7 (31.8)	0.31 ± 0.47	0.187

Note: ANOVA test, * $p<0.05$.

Table 4: Repartition of the associated factor of genital warts in the two groups.

Risk factors	HIV (-)	HIV (+)	13 (59.1)	13 (59.1)
	N (%)	p	N (%)	p
Smoking				
Yes	34 (70.8)	0.301	14 (66.7)	0.746
No	4 (33.3)		8 (29.2)	
Oral contraception				
Yes	18 (47.4)	0.607	12 (54.5)	0.00*
No	20 (56.6)		10 (45.5)	
Multi-partner sexual				
Yes	23 (60.5)	0.201	8 (36.4)	0.00*
No	14 (39.4)		14 (63.6)	
Earlier sexual intercourse				
Yes	18 (47.4)	0.395	9 (59.1)	0.516
No	20 (52.6)		13 (40.9)	

DISCUSSION

The high prevalence of genital warts among participants in this study, especially among women aged 26 to 30, underscores the urgency for targeted prevention and screening efforts in this age group. This prevalence aligns with findings from similar studies in developing countries [16,17] emphasizing the need for tailored interventions. Indeed, this could be due to sexual activity being more frequent among women in this age group, leading to a higher risk of exposure to HPV [17]. The higher prevalence among educated women may reflect increased health-seeking behaviour and awareness of preventive measures like HPV vaccination and cervical cancer screening [16-18]. The association between higher parity and increased risk of HPV infection corroborates previous research [19]. Factors such as changes in the cervix during pregnancy and childbirth may contribute to this association. Additionally, being single may indicate a higher likelihood of engaging in unprotected sexual activity, highlighting broader social and economic factors at play, such as barriers to healthcare access and socioeconomic status. Targeted prevention and screening efforts are crucial to address the high prevalence of genital warts among Cameroonian women. Moreover, addressing broader social and economic factors is essential to ensure equitable access to healthcare and mitigate the burden of HPV-related conditions.

The Genital wart among women HIV positive and HIV negative

This study demonstrates a significant association between HIV serology and genital warts among women in Cameroon, indicating that HIV-positive individuals are at greater risk of developing genital warts. HIV-induced immune regression is a major risk factor for HPV infection, exacerbating HPV-related symptoms [20,21]. The heightened prevalence of genital warts among HIV-positive women underscores the elevated cervical cancer rates observed in Africa [22]. Notably, HIV-positive individuals exhibit a higher prevalence of high-risk HPV, highlighting HIV as a potential risk factor for genital cancer [12,20,23]. The weakened immune system in HIV facilitates HPV replication and progression, leading to cervical intraepithelial lesions and genital warts [24]. Study indicated HIV target cells are found to be highly concentrated in the outermost skin layer of anogenital warts, providing a possible explanation for the observed association between HIV and genital warts [7]. Additionally, a recent study demonstrated that although low-risk HPV co-expression is not directly associated with genital cancer, it can increase DNA damage due to the accumulation of somatic mutations [25-27]. The observed association between HPV and HIV infections necessitates comprehensive prevention and management strategies for both conditions, particularly among vulnerable populations in developing countries.

Characteristic of genital warts among women with negative HIV and positive

This study reveals distinct characteristics of genital warts among women with positive and negative HIV status. Vaginal localization of genital warts is more prevalent among HIV-positive women, whereas vulvar localization is more common among HIV-negative women. This disparity may be attributed to differences in sexual behavior following counseling and screening, with HIV-positive individuals adopting safer sexual practices. This finding is consistent with a previous study that also reported higher rates of genital warts in the vaginal area among HIV-positive women [7]. Interestingly, a link was observed between positive HIV serology and vaginal condyloma, while negative HIV serology was associated with vulvar localization (p=0.037). This disparity may be attributed to differences in sexual behaviour following counselling and screening, with HIV-positive individuals adopting safer sexual practices. In this study, acuminate genital warts were more frequently found in HIV-negative women and may regress with a normal immune response, whereas papule genital warts, which were frequent among HIV-infected women could be less likely to regress [26]. Although there are limited studies comparing the types of genital warts in both groups, the results suggest that papule genital warts affect the mucosa more, which is in close proximity to low-grade cervical intraepithelial neoplasia [7,8].

The risk associated with HPV infection

Social determinants of health significantly shape the risk associated with HPV and HIV infections in developing countries. This study identifies distinct risk factors among HIV-positive and HIV-negative women, with sexual behaviour emerging as a primary risk factor. Among HIV-positive women, early oral contraceptive use emerged as a prominent risk factor, possibly due to its impact on hormonal concentrations, leading to an increased risk of genital warts [8]. Early oral contraceptive use is prominent among HIV-positive women, while smoking and multiple sexual partners are significant risk factors among HIV-negative women [28]. The observed association in this study between smoking, multiple sexual partners, and genital warts among HIV-positive women underscores the complex interplay between HPV and HIV infections [21]. The high prevalence of genital warts and HIV

among these women underscores the urgency of understanding and addressing these issues within the context of socio-cultural factors. Firstly, the majority of women noticed their genital warts themselves (60%), indicating a proactive approach to their health. However, this also suggests a potential lack of awareness about preventive measures or the importance of regular gynecologist consultations. Moreover, most women sought gynaecologist consultation only after noticing warts (67.14%), indicating a reactive rather than proactive approach to healthcare. This delay in seeking medical attention could be attributed to various factors, including cultural taboos, fear of stigma, or limited access to healthcare facilities. Additionally, a significant proportion of women had not visited a gynaecologist in over 3 months (80%). This highlights a lack of consistent gynaecological care, which may be influenced by socio-economic factors such as financial constraints, transportation issues, or cultural beliefs regarding healthcare utilization. The reliance on traditional medicine or homemade remedies by a considerable number of women (85%) further emphasizes the influence of socio-cultural beliefs on healthcare-seeking behaviour. Traditional medicine may be perceived as more accessible, affordable, or culturally acceptable, leading to its widespread use despite potential risks [29]. Moreover, the high prevalence of self-medication (75%) among women reflects the limited access to healthcare services or the lack of trust in the healthcare system. Self-medication can lead to improper treatment, delayed diagnosis, or adverse health outcomes, highlighting the need for improved access to quality healthcare services and Public health education initiatives [30].

CONCLUSION

Addressing socio-cultural barriers is crucial in improving healthcare-seeking behavior, promoting early detection and treatment, and reducing the burden of genital warts and HIV. Efforts should focus on raising awareness, improving access to healthcare services, and integrating traditional medicine practices into comprehensive healthcare systems. Addressing social determinants of health in prevention strategies can effectively lower HPV and HIV incidence in developing countries, ultimately improving the health outcomes of vulnerable populations.

Limitations and recommendations

This study was conducted in a single region of Cameroon and may not be generalizable to other regions or countries. Future studies could assess the psychological and social impact of genital warts on women in Cameroon and explore ways to improve.

ETHICAL CONSIDERATIONS

The research received proper authorization and ethics clearance from the Ethics Committee of Universite des Montagnes de Bagante (authorization IBR No 152/UDM/PR/CIE) and the Institutional Ethics Committee of Human Health of the hospital. Participants were provided with information regarding anonymity, confidentiality, and their rights, and free and informed consent was obtained from each participant.

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DISCLOSURE STATEMENT

The authors report no conflict of interest. The authors confirm that the research presented in this article met the ethical guidelines and received approval from the hospital.

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AVAILABILITY OF DATA AND MATERIALS

The authors declare that all data supporting the findings of this study are available on request due to privacy/ethical restrictions.

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