

The Prevalence of Cervical Cancer among Females Living with HIV/AIDS in Wuse District Hospital, Abuja, Nigeria: Epidemiological Trends and Health Outcomes

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Abstract

Cervical cancer remains a significant public health challenge, particularly among women living with HIV/AIDS. This paper aims to explore the prevalence and health outcomes associated with cervical cancer among females living with HIV/AIDS in Abuja, Nigeria. To achieve this objective, a cross-sectional retrospective study design was used to determine the prevalence of cervical cancer in females living with HIV between January 2022 to December 2023. Data was collected by use of folders and clients' records, well-articulated personal interviews, questionnaires and forms. A random sampling method was adopted to make sure that all important groups are captured including different age grades, socioeconomic status, cultural beliefs, tribe, marital status, educational level, religion, sexual behavior, and parity. Data extracted was inputted in Microsoft Excel 2010, analysis was done using statistical software SPSS (Statistical Package for Social Sciences). At the end of this analysis, the result showed that the prevalence of cervical cancer among females living with HIV/AIDS in Abuja is 4% which indicates that cervical cancer is a significant public health issue among HIV-positive women in Abuja. While this rate may appear modest, it is considerably higher than the general population, underscoring the heightened risk faced by females living with HIV.

Keywords: Abuja, Cervical Cancer, Females Living with HIV/AIDS.

Introduction

Cervical cancer is the second most common cancer in Nigeria and second to breast cancer among its female population [6]. Cervical cancer remains an important challenge in global health especially affecting women in low- and medium-income countries where there is limited or even, no access to screening and treatment services. Among the vulnerable populations, females living with Human Immunodeficiency Virus (HIV) are at a higher risk of cervical cancer because of immunosuppression and persistent infection with high-risk Human Papillomavirus (HPV) strains. Abuja, the Federal Capital Territory of Nigeria, constitutes a minute part of this issue, where both issues of HIV and cervical cancer

pose a substantial health burden on these individuals and an excessive demand on the limited healthcare resources. A systematic review on cervical cancer incidence and mortality rate shows that the scarcity of information reveals a substantial need for further studies on cervical cancer prevalence and mortality with associated risk factors [14]. Human Immunodeficiency Virus (HIV) continues to be a major global public health issue, affecting millions worldwide. Sub-Saharan Africa remains the region most severely affected, with Nigeria being one of the countries with a high HIV burden. In Nigeria, approximately 1.8 million people were living with HIV as of 2019, with a national prevalence rate of about 1.4% [27]. Abuja, the Federal

Capital Territory, also reflects these statistics, with a significant number of people living with HIV, many of whom are women. HIV can be transmitted through sexual contact, mother-to-child transmission, blood transfusions, needle sharing, and occupational exposure. Antiretroviral therapy (ART) is the cornerstone of HIV treatment, aimed at reducing the viral load in the body, maintaining immune function, and preventing opportunistic infections and transmission. The introduction of ART has transformed HIV from a fatal disease to a manageable chronic condition. According to [26], females living with HIV have higher risk of having cancer of the cervix as against women without HIV and globally, about 6% of women with cancer of the cervix have HIV and less than 5% of people that have cancer of the cervix are due to HIV. Studies conducted by [11] shows that the main determinant of having cancer of the cervix is the presence of HPV infection. Females living with HIV have a higher risk of having this HPV infection thereby causing cervical distortion and malignancy. This is because the immune system has already been compromised by this virus which has led to an immunosuppressive state. Understanding the comorbidities helps medical practitioners to know the essence of proper and complete health delivery to this vulnerable population. The comorbidities include coinfection with other sexually transmitted infections, chronic inflammation and opportunistic infections, non communicable diseases and nutritional deficiencies. There should be targeted care and intervention which include yearly cervical cancer screening, yearly or frequent monitoring of CD4 count and viral loads of this population and ensure proper adherence to ARVs. This is because co-morbid conditions commonly seen in HIV-positive women significantly impact the outcomes and prognosis of cervical cancer. National health policies and programs that support integrated care for HIV and cervical cancer are crucial. This includes training healthcare providers,

ensuring the availability of screening and treatment supplies, and monitoring and evaluation to track progress and outcomes [29]. Integrating cervical cancer screening and treatment into existing HIV care services in hospitals can improve access and adherence to screening guidelines. This approach leverages the existing infrastructure and resources of HIV clinics to provide comprehensive care [5]. Providing education and counselling on the importance of cervical cancer screening and the availability of services can enhance uptake and adherence. Cervical cancer remains one of the most significant health issues affecting women worldwide. According to the Global Cancer Incidence, Mortality and Prevalence (GLOBOCAN), approximately 570,000 cases and 311,000 deaths of cervical cancer were estimated to have occurred in 2018 worldwide [30]. The disease predominantly affects women in the prime of their lives, with the majority of cases occurring in women aged 35-44

years. The incidence and mortality rates of cervical cancer vary significantly across different regions of the world. High-income countries have seen a significant reduction in cervical cancer incidence and mortality due to effective screening programs and the widespread use of HPV vaccines. In contrast, low and middle-income countries (LMICs) continue to bear the highest burden of the disease, accounting for nearly 90% of cervical cancer deaths [8]. In Sub-Saharan Africa (SSA), cervical cancer is the leading cause of cancer deaths amongst women. The region carries the greatest burden, with 24.55% of the global mortality from cervical cancer [20]. There are some risk factors contributing to the increased prevalence of cervical cancer both in general population and in this vulnerable group. They include HPV infection, immunosuppression, income and access to health care, education and literacy, geographic location, behavioural factors (smoking, sexual behaviour), coinfection with other sexually transmitted infections (STI), socioeconomic

and demographic factors. Human Papillomavirus (HPV) is the primary etiological agent of cervical cancer. In most cases, persistent infection with highly infectious types of human papillomavirus (HPV) such as HPV 16 and 18 is believed to be the cause of the disease [21]. Immunosuppression is a critical factor in the increased risk of cervical cancer. HIV infection leads to the depletion of CD4+ T cells, which play a crucial role in the immune response against HPV [9]. Low CD4 counts are associated with higher rates of HPV persistence and progression to cervical intraepithelial neoplasia (CIN) and cervical cancer [9]. Smoking is an independent risk factor for cervical cancer. It contributes to immune suppression and enhances the persistence of HPV infections. Smoking damages cervical DNA and impairs local immune responses, facilitating carcinogenesis [25]. Due to the hardship Nigerian citizens face, most females, both young and old resort to having sex in exchange for money in a bid to make ends meet. The main risk factors correlated with HPV infection are early sexual debut, the number of partners, frequency and type of sexual contact and partner's sexual histories. [24]. Lower income levels limit access to healthcare services, including cervical cancer screening and treatment [10]. Financial barriers can delay diagnosis and treatment, leading to worse outcomes. Also, education level is directly linked to health literacy and awareness about cervical cancer. Women with higher education levels are more likely to participate in screening programs and adhere to medical advice [19]. Urban-rural disparities significantly affect healthcare access. Globally, cervical cancer (CC) incidence is higher in rural areas than in urban areas that could be explained by the influence of many factors, including inequity in accessibility of the CC prevention measures [31]. Finally, HIV infection leads to chronic immune activation and inflammation, which creates an environment that supports cancer

development. Although antiretroviral therapy effectively controls human immunodeficiency virus (HIV) replication, a residual chronic immune activation/inflammation persists throughout the disease [16]. These mechanisms above lead to increased susceptibility to infections and cancers in females living with HIV. Research conducted in Ibadan and Abuja between 2009 and 2010 showed that with about 20% of the people in Africa, and a bit above half of the West African people, 15% of about 681,000 recent cancers in 2008 came from Nigeria [4]. Another research carried out in Enugu showed that in 2007, 36.59million females greater than 15years in Nigeria develop cancer of the cervix and there are 9,922 annual cases with 8,030 mortality [6]. Ref. [6] also goes on to say that there are more than 560,000 recent cases and about 275,000 mortalities documented yearly, globally with 80% happening in the third world countries. HIV-positive women have higher human papillomavirus (HPV) prevalence and cervical cancer (CC) incidence than HIV-negative women, partly due to HIV's modifying effect on HPV pathogenesis [15]. The immunosuppressive nature of HIV impairs the body's ability to clear HPV, leading to persistent infections that are more likely to progress to cervical cancer [23]. HIV and HPV co-infection lead to synergistic effects that exacerbate the oncogenic potential of HPV. HIV-induced immune suppression allows for the unchecked activity of HPV's oncogenes, accelerating the progression from infection to malignancy [3]. Antiretroviral therapy (ART) has significantly improved the prognosis of HIV-positive individuals via immune reconstitution. ART improves immune function by increasing CD4 counts and reducing HIV viral load [19]. This immune reconstitution can help control HPV infections and reduce the progression to cervical cancer [10]. The effectiveness of ART in reducing cervical cancer risk is highly dependent on adherence. The widespread use of ART has improved the

overall health and life expectancy of HIV-positive individuals. However, even with ART, the risk of cervical cancer remains elevated. Studies indicate that while ART helps in partial immune reconstitution, it does not completely eliminate the increased risk of cervical cancer in HIV-positive women [10].

Methodology

This study used cross sectional retrospective and descriptive prospective designs with a mixed methods approach, combining quantitative and qualitative techniques. The cross-sectional retrospective study design was used to determine the prevalence of cervical cancer in females living with HIV between January 2022 to December 2023. The descriptive prospective designs was used to determine the risk factors amongst the study participants. Inclusion criteria for study participants include HIV positive female clients already on anti-retroviral drugs, ages between 24 and 49 years old, if less than 24 years, should be sexually active, non pregnant, not menstruating, living in Abuja, Nigeria, ability to give informed consent. Exclusion criteria include males, females not sexually active/virgins, pregnant, menstruating, HIV negative individuals, females undergoing cervical cancer treatment, females that have their cervixes removed for one reason or the other, inability to give informed consent, not living in Abuja. A random sampling method was adopted to make sure that all important groups are captured including different age grades, socioeconomic status, cultural beliefs, tribe, marital status, educational level, religion,

Results

sexual behavior, and parity. The sample size calculation was based on the Lorenz formula: $n = z^2 \cdot p \cdot q / e^2$ (where n is the sample size, p the past prevalence of the disease under investigation ($p + q = 1$), z the value corresponding to the significant criterion of 95% confidence which is equal to 1.96 and e the minimal expected difference. Therefore, to calculate the sample size with a prevalence rate of 6% [18] and to achieve a 95% confidence level with 5% margin error for research on prevalence of cervical cancer among females in people living with HIV in Abuja, Nigeria, a sample size of 86 clients is needed. Sources of data (e.g., medical records, cancer registries, national surveys): Well-articulated personal interviews were conducted, questionnaires and forms were used to achieve information for consent, HIV status, cervical cancer screening data and information. Clients' records and folders were checked to authenticate their HIV status, duration of HIV infection, latest viral load results, cervical cancer screening results including positive and negative results. Hospital facility was also informed so we can get every information concerning cervical cancer screening and outcomes among this vulnerable population and age group. Data extracted was inputted in Microsoft Excel 2010, analysis was done using statistical software SPSS (Statistical Package for Social Sciences). Result representation was in percentages, frequency distribution tables, figures, and charts. The Chi square test was used to determine the risk factors and relationship between HIV and cervical cancer prevalence.

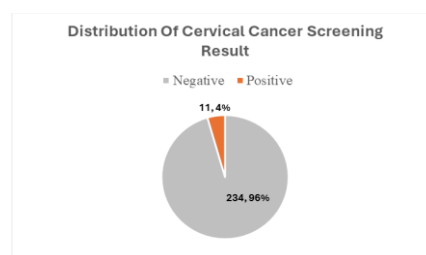


Figure 1. Pie Chart of Prevalence of Cervical Cancer in Wuse District Hospital

Survival rates and prognosis for HIV-positive women with cervical cancer are generally poorer compared to HIV-negative women due to several factors related to both their HIV status and the progression of cervical cancer. Studies have shown that HIV-positive women with cervical cancer have lower survival rates compared to their HIV-negative counterparts which is because of an already compromised immune system. The degree of immunosuppression, as measured by CD4+ T cell counts, significantly affects prognosis. Lower CD4 counts are associated with higher mortality and poorer outcomes. HIV-positive women with CD4 counts below 200 cells/ μ L have a significantly increased risk of cervical cancer-related mortality compared to those with higher CD4 counts [17]. ART improves immune function by increasing CD4 counts and reducing HIV viral load [23]. This immune reconstitution can help control HPV infections and reduce the progression to cervical cancer [13]. With the availability of antiretroviral therapy (ART) coupled with early diagnosis, people living with HIV (PLHIV) now live longer. [18]. The effectiveness of ART in reducing cervical cancer risk is highly dependent on adherence. Introduction of antiretroviral therapy (ART) decreased risks of opportunistic infections and improved overall survival [11]. The quality of life of this vulnerable population will be reduced if treatment challenges and comorbidities are not properly managed. These challenges include delays in diagnosis, limited access to specialized oncology care, and complications related to HIV co-morbidities and treatment interactions [12]. Additionally, HIV-positive women may experience more severe side effects from cancer treatments such as radiotherapy and chemotherapy, which can further impact their prognosis [2]. Studies have shown that the prevalence of cervical cancer is 2-4 times higher in HIV-positive women. Women infected with human immunodeficiency virus (HIV) suffer from

precancerous cervical lesions and severe invasive cervical cancer (ICC) at rates that far exceed those of their HIV-free counterparts [7].

Discussion

The pie chart presented above (Figure 1) shows the distribution of cervical cancer screening results among HIV-positive females in Abuja, Nigeria. Out of the total screened population, 4% tested positive for cervical cancer, while 96% tested negative. This result provides critical insights into the prevalence of cervical cancer and its associated risk factors within this vulnerable group. The prevalence rate of 4% indicates that cervical cancer is a significant health issue among HIV-positive females living in Abuja. While this rate may appear modest, it is considerably higher than the general population, underscoring the heightened risk faced by females living with HIV. HIV-positive females are more susceptible to cervical cancer due to several risk factors like immunosuppression, persistent HPV infections, coinfections and comorbidities and so on. HIV weakens the immune system, reducing the body's ability to clear HPV infections, which are the primary cause of cervical cancer. The overall reduction in immune surveillance due to HIV allows HPV-infected cells to evade immune detection and destruction. This escape from immune control facilitates the accumulation of genetic mutations and the transformation of normal cells into cancerous ones [17]. The compromised immune system of HIV-positive women leads to persistent HPV infections, increasing the risk of developing cervical cancer. HIV-positive women often have other infections and health conditions that can further weaken their immune response and contribute to cancer development. In women with HPV, one factor that increases the risk of progression to cervical cancer is co-infection with a different STI [28]. The socio-demographic data of the screened population, highlights several risk factors associated with cervical cancer

prevalence. A substantial proportion of the women are in the age groups (35-44 years) where the risk of cervical cancer is higher. These age groups are more likely to have a longer duration of HPV infection and multiple childbirths, both of which are risk factors. The high percentage of unemployed women and those with low income suggests limited access to healthcare services. Financial constraints may prevent these women from accessing regular screenings and timely treatments. Low levels of education are linked to reduced health literacy. Low education levels and low financial status are among the two significant social risk factors of cervical malignancy as it leads to poor access to disease screening services and resistance against screening visits [21]. Women with little or no formal education may lack awareness about cervical cancer prevention and the importance of regular screenings. A majority reside in rural areas where healthcare infrastructure is often inadequate. Rural women face barriers such as distance to healthcare facilities, lack of transportation, and fewer healthcare providers trained in cervical cancer screening. High rates of early marriage and multiple childbirths (parity) also increase the risk of cervical cancer. Early marriage leads to early sexual activity and higher exposure to HPV, while multiple childbirths cause repeated trauma to the cervix. Several barriers contribute to the lower screening rates and delayed treatment among HIV-positive women. A study carried out by [1] says that proper screening allows for early detection and effective management of cervical cancer, but limited awareness and various barriers hinder women's access to screening services. HIV-positive women may face stigma, discouraging them from seeking medical help. Also, cultural norms and misconceptions about cervical cancer and its screening and limited availability of screening programs and trained healthcare personnel in rural areas can deter women from undergoing screenings. To address the high prevalence of cervical cancer among HIV-

positive women in Abuja, targeted interventions are essential. Increase awareness about the importance of cervical cancer screening, especially among less educated and rural populations. Expand cervical cancer screening services, particularly in rural areas, through mobile clinics and integrating screenings with HIV care. Provide financial assistance or subsidies for cervical cancer screening and treatment to overcome economic barriers. Involve community and religious leaders in health education campaigns to change cultural attitudes and reduce stigma. There are recommendations for early detection and screening programs that aim to enhance early diagnosis, improve treatment outcomes, and reduce the overall burden of cervical cancer in this vulnerable population. They include integrating routine cervical cancer screening into standard HIV care protocols for all HIV-positive women. This should include Pap smears, Visual Inspection with Acetic Acid (VIA), or Visual Inspection with Lugol's Iodine (VILI) every 6 months to 1 year. Introduce HPV DNA testing as a primary screening tool for HIV-positive women to identify high-risk HPV types that significantly increase the risk of cervical cancer. Develop comprehensive educational campaigns to raise awareness about the importance of cervical cancer screening and the increased risk for HIV-positive women. These programs should target both healthcare providers and patients. Use community health workers to educate women in rural and underserved areas about cervical cancer risks and the benefits of regular screening. Implement mobile clinics to provide screening services in remote and underserved areas where access to healthcare facilities is limited. Ensure that cervical cancer screening services are free and available in all HIV care and treatment clinics to facilitate easy access for women attending these clinics. To address the prevalence and associated risk factors of cervical cancer among females living with HIV in Abuja, Nigeria, it is crucial to implement

integrated care strategies. These strategies focus on combining HIV and cervical cancer services to enhance prevention, early detection, and treatment, thereby improving health outcomes for this vulnerable population. These include providing subsidized or free screening and treatment services for cervical cancer to reduce financial barriers for women living with HIV. Offer incentives, such as transport stipends or food vouchers, to encourage women to attend screening and follow-up appointments. Advocate for policies that support integrated HIV and cervical cancer care. This includes policies that ensure funding, training, and resources are allocated for comprehensive women's health services. Improve healthcare facilities to provide both HIV and cervical cancer services under one roof. This includes equipping clinics with the necessary tools for screening and treatment of cervical cancer. Train healthcare providers on the integrated approach to managing HIV and cervical cancer. This includes training on screening techniques, patient education, and management of co-morbid conditions. There are some limitations in this study which include reluctance to fill in the questionnaire because they are in a hurry to leave the facility, difficulty filling the questionnaire because of illiteracy and language barrier. Some respondents are illiterates and cannot speak English and translators are difficult to find sometimes. Also, there was sampling bias, problem in data Collection, confounding factors, resource constraints, ethical and privacy concerns. The study was hospital-based research; therefore, the sample was not a true representative of the broader population of HIV-positive females living in Abuja, leading to biased prevalence and risk factor estimates. It was also limited by access to certain populations, especially those in rural areas or those not engaged in regular HIV care, which can skew results. The study mostly relied on self-reported data, which could lead to inaccuracies due to recall bias or social desirability bias. The study faced the challenge

in controlling for all potential confounders, such as co-infections, other health conditions, and lifestyle factors, which might also influence cervical cancer risk. The present work was carried out in the hospital settings and there were challenges in ensuring participant confidentiality and managing sensitive health information, obtaining informed consent and ensuring ethical conduct throughout the study was complex, particularly in vulnerable populations. Limited funding and resources constrained the scope of the study, including sample size, duration, and data collection methods. These resource limitations affected the depth and breadth of the analysis.

Future Research Perspectives

Comparative research can be conducted to explore differences in cervical cancer prevalence and risk factors between HIV-positive and HIV-negative women, enhancing the understanding of HIV's impact. Long term Studies can be done to monitor the process of transmission of HPV infection to cancer of the cervix in females living with HIV. Also, new innovative interventions can be formed by observing over a period of time the prevalence and risk factors to have some knowledge on how it evolves. Research can be widened to add a greater and wider topographical area outside Abuja to distinguish between urban and rural dwellers while exploring differences by region in prevalence and risk factors to tailor public health interventions appropriately. Religious and cultural factors can be researched to have a detailed study on the impact of cultural beliefs, and religious practices on the uptake of cervical cancer screening and treatment among HIV-positive women to explore more hinderances to healthcare access and develop interventions to overcome them. Interventional Studies like assessing and devising means to the effectiveness and possibility of targeted interventions, such as mobile screening units for community use. Evaluate the effect of different intervention plans on increasing

screening rates and early detection. New innovative interventions can drive the development of new preventive and therapeutic interventions, including vaccines and novel screening technologies. Health system enhancement, to research the possibility and effectiveness of incorporating free cervical cancer screening with routine HIV care services in all hospitals in Nigeria all year round and evaluate the impact of improving healthcare infrastructure on screening uptake and patient outcomes. Study the quality of life and psychosocial aspects of HIV-positive women diagnosed with cervical cancer. Carry out policy and Health Economics research to investigate the policy implications of cervical cancer screening and treatment programs for HIV-positive women and analyse the economic burden of cervical cancer in HIV-positive populations and the potential savings from preventive measures. Carry out community-based participatory research to engage communities in the research process to better understand their needs and preferences and develop community-led initiatives to increase awareness and participation in cervical cancer screening programs.

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Conclusion

The result of 4% prevalence of cervical cancer among HIV-positive females living in Abuja highlights the urgent need for comprehensive public health strategies. These strategies should focus on improving access to cervical cancer screening, enhancing health education, and addressing socio-economic and cultural barriers by healthcare providers, policymakers, and researchers. By implementing targeted interventions, integrating health care services, providing education and awareness campaigns, advocating for policy changes, prioritizing this vulnerable population, and strengthening global health systems, the healthcare system can reduce the prevalence of cervical cancer and improve the health outcomes for HIV-positive females living in Abuja, Nigeria.

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Conflict of Interest

We, the authors declare that we do not have any conflict of interest.

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