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HIV/AIDS and Diabetes Co-Morbidity in Nigeria: Emerging Trends, Clinical Management, and Health System Challenges

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ABSTRACT

The co-morbidity of HIV/AIDS and diabetes has become an emerging public health concern in Nigeria, as individuals living with HIV (PLHIV) experience increased longevity due to the widespread use of antiretroviral therapy (ART). While ART has significantly reduced HIV-related mortality, it has inadvertently contributed to the rising incidence of non-communicable diseases (NCDs), particularly diabetes mellitus. Diabetes, especially type 2, has emerged as one of the most prevalent comorbidities among PLHIV, posing significant challenges for clinical management and healthcare delivery in Nigeria. This review explores the complex relationship between HIV, ART, and diabetes, examining the factors contributing to the rising prevalence of diabetes among PLHIV, including metabolic disturbances induced by ART, chronic inflammation from HIV infection, and modifiable lifestyle risk factors. The clinical management of both conditions presents unique challenges, as managing the dual burden requires an integrated approach that accounts for ART-induced metabolic complications and tight glycemic control. The Nigerian healthcare system, however, faces significant barriers, including limited resources, insufficient training for healthcare workers, and fragmented care. The review highlights the need for integrated care models, enhanced healthcare infrastructure, and public health interventions to address the growing burden of HIV and diabetes co-morbidity. Effective management strategies and policy reforms are essential to improve health outcomes for PLHIV and mitigate the rising prevalence of diabetes in this population.

Keywords: HIV/AIDS, diabetes, co-morbidity, antiretroviral therapy (ART), Nigeria, non-communicable diseases (NCDs).

INTRODUCTION

The HIV/AIDS epidemic remains one of the most devastating global health crises, especially in sub-Saharan Africa, where the prevalence of the disease continues to be disproportionately high. In Nigeria, the fourth most populous country in the world, the human toll of HIV has been staggering [1]. Despite remarkable advancements in healthcare, HIV remains a major public health concern, with Nigeria home to one of the largest populations of people living with HIV (PLHIV) globally. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), over 1.9 million Nigerians are living with HIV, contributing to a persistent public health challenge [2]. However, over the past two decades, the expansion of antiretroviral therapy (ART) has led to a significant decrease in HIV-related mortality, improving the quality of life and survival rates of those infected. The success of ART in prolonging life has brought about an unexpected, though equally concerning, challenge: the growing burden of non-communicable diseases (NCDs) among people living with HIV [3]. As ART helps control viral replication and boosts immune function, individuals with HIV are now living longer lives, leading to an increased prevalence of

other diseases that typically affect older populations, such as diabetes, hypertension, and cardiovascular diseases. This shift from acute infectious diseases to chronic conditions is a new paradigm for managing HIV, complicating treatment regimens and healthcare delivery [4]. Among these NCDs, diabetes mellitus, particularly type 2 diabetes, has emerged as one of the most prevalent comorbidities among PLHIV. The rising incidence of diabetes among individuals on ART has raised significant concerns for healthcare providers in Nigeria. The relationship between HIV, ART, and diabetes is complex, influenced by metabolic changes induced by long-term ART use, the chronic inflammation caused by HIV infection itself, and lifestyle risk factors such as poor diet and physical inactivity [5]. Nigeria, with its growing urbanization, has witnessed rapid lifestyle changes, including increased consumption of processed foods, sedentary behavior, and decreased physical activity, all of which are risk factors for type 2 diabetes. The confluence of HIV, ART-induced metabolic disturbances, and these modifiable lifestyle factors creates a perfect storm for the rise of diabetes among PLHIV [6]. This situation demands urgent attention from public health policymakers and healthcare professionals, as diabetes complicates the clinical management of HIV, further challenging the health system and the individuals affected [6].

The increasing comorbidity of diabetes in individuals living with HIV presents significant challenges to both healthcare providers and patients. While ART has improved survival and quality of life for those living with HIV, it has also brought about a parallel rise in chronic diseases, particularly diabetes. Diabetes among PLHIV is associated with poor glycemic control, leading to a higher incidence of complications such as cardiovascular disease, kidney dysfunction, neuropathy, and other diabetic complications [7]. Furthermore, managing HIV and diabetes simultaneously is a complex task, requiring a multidisciplinary approach to care. The problem is compounded by the limited capacity of healthcare systems in Nigeria to provide integrated care that addresses both HIV and diabetes. Healthcare workers, particularly in rural areas, often face challenges such as insufficient training on the management of co-morbid conditions, a lack of appropriate diagnostic tools, and limited access to resources for the management of diabetes [8]. Additionally, there is a lack of comprehensive data on the extent of the diabetes epidemic among PLHIV, which hampers effective planning and implementation of healthcare interventions. In a country like Nigeria, where the healthcare system is under-resourced, the dual burden of HIV and diabetes places an enormous strain on the healthcare infrastructure [9]. The urgency of addressing this challenge is clear, but it is necessary to first understand the interplay between HIV, ART, and diabetes, to develop effective management strategies, and to implement policies that can mitigate the rising burden of diabetes in this population [10].

This study aims to investigate the rising prevalence of diabetes among individuals living with HIV (PLHIV) in Nigeria, examining the factors contributing to this trend and the implications for healthcare management. The specific objectives include assessing the prevalence of type 2 diabetes among PLHIV, which will provide essential data for healthcare planning and resource allocation. Another key objective is to explore the association between antiretroviral therapy (ART) and the development of diabetes. Given that ART has become a cornerstone of HIV treatment, this objective will evaluate its long-term metabolic effects, particularly how ART may predispose individuals to diabetes, with a focus on regimens commonly used in Nigeria. Additionally, the study will assess the role of modifiable lifestyle factors such as diet, physical activity, and obesity on the risk of developing diabetes. This is essential in identifying preventive measures that can be incorporated into the care of PLHIV. The study will also investigate the challenges faced by healthcare providers in managing the dual burden of HIV and diabetes, highlighting the barriers to effective care. Finally, the study aims to propose integrated care strategies that address both HIV and diabetes management, promoting improved health outcomes for PLHIV. These objectives are crucial in developing comprehensive solutions to address the evolving healthcare needs of individuals living with HIV in Nigeria.

Emerging Trends

The rising incidence of diabetes among HIV-positive individuals is a growing concern globally, including in Nigeria, where the HIV/AIDS epidemic remains prevalent. Studies show that the prevalence of diabetes in this group is significantly higher than in the general population. This trend is alarming, particularly in Nigeria, where healthcare systems are often under-resourced and lack access to advanced medical interventions [11]. Several factors contribute to the increasing rates of diabetes in HIV-positive individuals. First, long-term use of antiretroviral therapy (ART), especially drugs like protease inhibitors (PIs) and nucleoside reverse transcriptase inhibitors (NRTIs), has been associated with metabolic disturbances such as insulin resistance, hyperlipidemia, and abnormal fat distribution. These changes elevate the risk of developing diabetes. Second, chronic inflammation caused by persistent low-level HIV infection can interfere with normal glucose metabolism, leading to insulin resistance [12]. Third, the aging HIV-positive population presents an additional risk, as older individuals are more susceptible to age-related chronic diseases like type 2 diabetes, particularly when compounded by conditions like hypertension and dyslipidemia. Finally, urbanization and lifestyle changes in Nigeria, such as poor diet, sedentary lifestyles, and rising

obesity rates, contribute to the increasing prevalence of diabetes, further exacerbating the health challenges faced by those living with HIV [13].

Clinical Management of HIV and Diabetes Co-Morbidity

The management of HIV and diabetes co-morbidity is a multifaceted challenge that requires an integrated approach to effectively address both conditions. Antiretroviral therapy (ART) is the foundation of HIV treatment, significantly reducing viral load and improving immune function. However, in patients with diabetes, the choice of ART drugs is critical [14]. Some ART medications, particularly protease inhibitors (PIs) and certain nucleoside reverse transcriptase inhibitors (NRTIs), can exacerbate metabolic issues by increasing insulin resistance and dyslipidemia. Therefore, healthcare providers must carefully monitor blood glucose levels and adjust ART regimens to minimize the risk of diabetes progression [15]. Newer ART classes, such as integrase inhibitors and non-nucleoside reverse transcriptase inhibitors (NNRTIs), offer more favorable metabolic outcomes and should be prioritized in individuals with a high risk of metabolic complications. In managing diabetes within the context of HIV, tight glycemic control is essential to reduce the risk of complications from both diseases [16]. This involves a combination of lifestyle modifications, such as diet and exercise, pharmacological management with oral hypoglycemics or insulin, and regular monitoring of blood glucose levels. The challenge lies in developing a regimen that does not interfere with ART or worsen metabolic side effects like weight gain and insulin resistance, which are common in HIV patients on long-term ART [17]. Finally, individuals with HIV and diabetes face an elevated risk of cardiovascular diseases, kidney failure, and neuropathy. Effective management requires routine screenings for these complications, as well as targeted interventions like antihypertensive medications, statins, and renoprotective agents [18].

Health System Challenges

The management of HIV and diabetes co-morbidity in Nigeria presents significant challenges to the healthcare system. First, Nigeria's healthcare infrastructure, especially in rural and underserved areas, is severely limited. The scarcity of specialized clinics and trained healthcare workers further complicates the management of the dual diagnosis [19]. Healthcare providers often lack the expertise to address the complexities of co-morbid HIV and diabetes, and diagnostic tools such as HbA1c tests and advanced imaging for diabetic complications are rarely accessible. Secondly, financial constraints exacerbate the situation. While antiretroviral therapy (ART) is provided free of charge through government and donor-funded programs, diabetes medications, including insulin and oral hypoglycemics, can be prohibitively expensive [20]. This financial burden hinders many Nigerians, especially those in low-income brackets, from obtaining consistent treatment. Additionally, public awareness about the relationship between HIV and diabetes remains alarmingly low. Many people living with HIV may not recognize the heightened risk of developing diabetes, and healthcare professionals may not be adequately trained to detect or manage the co-morbidity effectively [21]. The absence of integrated care models means patients must often seek care from multiple providers for each condition, leading to fragmented treatment and, in many cases, suboptimal health outcomes. Addressing these challenges requires a multi-faceted approach, focusing on improving healthcare infrastructure, reducing treatment costs, and increasing awareness and training for both patients and healthcare providers [22].

Implications for Integrated Chronic Disease Care

The increasing prevalence of HIV and diabetes co-morbidity in Nigeria calls for urgent reforms in chronic disease management. To effectively address this challenge, it is critical to adopt integrated chronic disease management strategies that streamline the care of both conditions. A key aspect of this approach is coordinated care, where healthcare systems prioritize integrated care models [23]. These models involve healthcare providers working together to manage HIV and diabetes concurrently, rather than treating them as separate entities. This integrated approach ensures comprehensive care that improves patient outcomes by addressing the complexities of managing dual chronic conditions. Furthermore, training and capacity building for healthcare providers are essential to equip them with the necessary skills and knowledge to effectively manage both HIV and diabetes [24]. By investing in specialized training programs, healthcare professionals can enhance their ability to deliver high-quality care to patients with co-morbid conditions. Additionally, policy and funding support play a pivotal role in ensuring the sustainability of integrated care models. Expanding access to essential medications, diagnostics, and treatment options for both HIV and diabetes is crucial for improving patient outcomes. Increased funding and public awareness campaigns are needed to advocate for dual-care initiatives, which will empower patients and communities to seek comprehensive care [25]. These combined efforts will strengthen the healthcare system and help reduce the burden of HIV and diabetes in Nigeria.

CONCLUSION

The co-morbidity of HIV/AIDS and diabetes is increasingly becoming a significant public health issue in Nigeria, demanding urgent attention and coordinated interventions. The rising number of people living with HIV, coupled with the growing prevalence of diabetes, calls for integrated clinical management strategies that address both conditions simultaneously. Long-term antiretroviral therapy (ART) is known to contribute to metabolic

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complications, including insulin resistance and elevated blood sugar levels, thus increasing the risk of diabetes among individuals with HIV. Effective management of these dual burdens requires not only appropriate medical interventions but also substantial reforms within the healthcare system to ensure that both diseases are managed holistically. Collaborative healthcare approaches, involving multidisciplinary teams of healthcare providers, are essential to improve patient outcomes. By integrating the management of HIV and diabetes within the broader context of chronic disease care, healthcare providers can deliver more comprehensive care, reducing the risk of complications and improving the quality of life for individuals living with both conditions.

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