

HIV-Related Skin Manifestations: Clinical Presentation

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ABSTRACT

Human Immunodeficiency Virus (HIV) infection is associated with a wide spectrum of dermatological manifestations, which often serve as initial indicators of immune dysregulation and disease progression. These cutaneous reactions range from infectious dermatoses, such as viral, bacterial, and fungal infections, to inflammatory and neoplastic conditions, including seborrheic dermatitis, psoriasis, and Kaposi's sarcoma. The underlying pathophysiology of these dermatological reactions is multifactorial, involving direct viral effects, immune suppression, and opportunistic infections. This article provides a comprehensive review of the dermatological reactions observed in HIV-positive patients, emphasizing their clinical presentations, diagnostic approaches, and therapeutic interventions. By understanding the dermatological spectrum of HIV, clinicians can improve early diagnosis, optimize treatment, and enhance the quality of life for affected individuals. The review also highlights the importance of interdisciplinary collaboration in managing these complex dermatological conditions.

KEYWORDS: HIV, dermatological manifestations, cutaneous reactions, opportunistic infections, immune suppression, Kaposi's sarcoma, seborrheic dermatitis, psoriasis, antiviral therapy, interdisciplinary management.

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INTRODUCTION

The Human Immunodeficiency Virus (HIV) remains a significant global health challenge, with dermatological manifestations being among the earliest and most common clinical features of the disease. The skin, as a primary barrier and immunological organ, often reflects the systemic immune status of HIV-positive patients. As the virus progressively depletes CD4⁺ T lymphocytes, the resulting immune suppression predisposes patients to a myriad of dermatological conditions, including infectious, inflammatory, and neoplastic disorders. These cutaneous reactions not only contribute to the morbidity and mortality associated with HIV but also significantly impact patients' quality of life and psychological well-being.^{1,2}

Dermatological manifestations in HIV-positive individuals are highly diverse and can vary depending on the stage of the disease, the degree of immune suppression, and the presence of comorbid conditions. Early in the course of HIV infection, patients may present with acute exanthems or generalized maculopapular rashes, often associated with seroconversion. As the disease progresses, opportunistic infections such as

herpes simplex virus (HSV), human papillomavirus (HPV), and fungal infections become more prevalent. Additionally, chronic inflammatory conditions like seborrheic dermatitis and psoriasis are frequently observed, often with atypical and severe presentations. Kaposi's sarcoma, a vascular neoplasm associated with human herpesvirus-8 (HHV-8), is a hallmark of advanced HIV disease and remains a significant cause of morbidity.^{3,4}

The management of dermatological reactions in HIV-positive patients requires a multifaceted approach, including antiretroviral therapy (ART) to restore immune function, targeted treatments for specific dermatoses, and preventive measures to reduce the risk of opportunistic infections. Early recognition and intervention are critical to improving outcomes and preventing complications. This article aims to provide a detailed overview of the dermatological manifestations associated with HIV, exploring their clinical features, underlying mechanisms, and current management strategies. By integrating the latest evidence and clinical insights, this review seeks to enhance the understanding and care of dermatological conditions in HIV-positive patients,

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ultimately contributing to better health outcomes and improved quality of life.^{5,6}

Epidemiology of Dermatological Reactions in HIV-Positive Patients

The epidemiology of dermatological reactions in patients infected with the Human Immunodeficiency Virus (HIV) is intricately linked to the global burden of HIV/AIDS, the degree of immune suppression, geographic location, access to healthcare, and the prevalence of comorbid infections. Dermatological manifestations are among the most common clinical features of HIV, affecting up to 90% of individuals at some point during the course of their disease. These cutaneous reactions often serve as early markers of HIV infection and can provide critical insights into the patient's immune status, particularly as CD4+ T-cell counts decline.⁷ Globally, the prevalence and spectrum of dermatological reactions in HIV-positive patients vary significantly based on regional factors such as the prevalence of opportunistic infections, socioeconomic conditions, and the availability of antiretroviral therapy (ART). In resource-limited settings, where access to ART and diagnostic tools may be constrained, dermatological conditions are frequently more severe and are often associated with advanced HIV disease. In contrast, in regions with widespread ART availability, the incidence of severe opportunistic infections and neoplastic dermatological conditions, such as Kaposi's sarcoma, has markedly declined. However, even in well-resourced settings, dermatological reactions remain a significant clinical concern due to the chronic nature of HIV and the aging population of individuals living with the virus.^{7,8}

The most frequently observed dermatological manifestations in HIV-positive patients include infectious, inflammatory, and neoplastic conditions. Infectious dermatoses, such as viral infections (e.g., herpes simplex virus, varicella-zoster virus, and human papillomavirus), fungal infections (e.g., candidiasis, dermatophytosis, and cryptococcosis), and bacterial infections (e.g., *Staphylococcus aureus* and *Mycobacterium tuberculosis*), are highly prevalent, particularly in individuals with CD4+ counts below 200 cells/ μ L. Inflammatory conditions, such as seborrheic dermatitis, psoriasis, and eosinophilic folliculitis, are also common, often presenting with atypical and more severe clinical features in HIV-positive patients compared to the general population. Neoplastic conditions, particularly Kaposi's sarcoma, are strongly associated with advanced HIV disease and coinfection with human herpesvirus-8 (HHV-8).⁹ The epidemiology of these dermatological reactions has evolved significantly since the advent of ART. Prior to the widespread use of ART, dermatological manifestations were often severe and life-threatening, reflecting profound immune suppression. However, with the introduction of ART, the incidence of many opportunistic infections and neoplastic conditions has decreased, and the overall spectrum of dermatological reactions has shifted toward chronic inflammatory and metabolic conditions. Despite these

advances, dermatological reactions remain a significant cause of morbidity and reduced quality of life in HIV-positive patients, particularly in those with poor adherence to ART or delayed diagnosis.¹⁰

Geographic and demographic factors also play a critical role in shaping the epidemiology of dermatological reactions in HIV-positive patients. In sub-Saharan Africa, where the burden of HIV is highest, Kaposi's sarcoma and infectious dermatoses are particularly prevalent. In contrast, in high-income countries, chronic inflammatory conditions and drug-related cutaneous adverse reactions are more commonly observed. Additionally, certain populations, such as men who have sex with men (MSM), intravenous drug users, and individuals with limited access to healthcare, are at increased risk for both HIV infection and associated dermatological complications.¹⁰

In conclusion, the epidemiology of dermatological reactions in HIV-positive patients is complex and multifaceted, reflecting the interplay between viral pathogenesis, immune suppression, geographic and socioeconomic factors, and the availability of medical interventions. Understanding the epidemiological trends and risk factors associated with these conditions is essential for developing targeted prevention and treatment strategies, improving patient outcomes, and reducing the global burden of HIV-related dermatological morbidity.¹¹

Clinical Manifestations of Dermatological Reactions in HIV-Positive Patients

The dermatological manifestations observed in patients infected with the Human Immunodeficiency Virus (HIV) are remarkably diverse, reflecting the complex interplay between viral pathogenesis, immune dysregulation, and opportunistic infections. These cutaneous reactions often serve as critical clinical indicators of the stage and progression of HIV disease, with their severity and presentation closely correlated to the degree of immune suppression, as measured by CD4+ T-cell counts. The spectrum of dermatological reactions in HIV-positive patients encompasses infectious, inflammatory, neoplastic, and drug-related conditions, each presenting with distinct clinical features and diagnostic challenges.¹¹

Infectious Dermatoses

Infectious dermatoses are among the most prevalent and clinically significant dermatological manifestations in HIV-positive patients. The risk and severity of these infections increase as CD4+ counts decline, particularly when levels fall below 200 cells/ μ L.¹²

Viral Infections:

Herpes Simplex Virus (HSV): HSV infections in HIV-positive patients often present as severe, chronic, and recurrent mucocutaneous ulcers, particularly in the orolabial and anogenital regions. These lesions may coalesce into large, painful erosions and are frequently resistant to standard antiviral therapies.¹²

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1 **Varicella-Zoster Virus (VZV):** Herpes zoster, or shingles, is a common manifestation in HIV-positive individuals, often occurring at earlier stages of immune suppression. The presentation is typically characterized by painful, unilateral vesicular eruptions following dermatomal distributions. Disseminated zoster, with widespread cutaneous involvement, may occur in advanced HIV disease.¹²

2 **Human Papillomavirus (HPV):** HPV infections are highly prevalent in HIV-positive patients, leading to extensive and recalcitrant anogenital warts, verruca vulgaris, and plantar warts. These lesions are often larger, more numerous, and less responsive to treatment compared to immunocompetent individuals.¹²

3 **Fungal Infections:**

1 **Candidiasis:** Oropharyngeal and esophageal candidiasis are common early manifestations of HIV, often presenting as creamy white plaques that can be scraped off, leaving an erythematous base. Cutaneous candidiasis may also occur, particularly in intertriginous areas.¹³

2 **Dermatophytosis:** Tinea infections, including tinea corporis, tinea cruris, and tinea pedis, are frequently observed in HIV-positive patients. These infections may present with atypical features, such as extensive involvement, deeper tissue invasion, or lack of response to standard antifungal therapies.¹³

3 **Cryptococcosis:** Cutaneous cryptococcosis, although rare, can manifest as papules, nodules, or ulcers, often resembling molluscum contagiosum or Kaposi's sarcoma.¹³

4 **Bacterial Infections:**

1 **Staphylococcus aureus:** Staphylococcal infections, including folliculitis, impetigo, and cellulitis, are common in HIV-positive patients. Recurrent bacterial infections may indicate advanced immune suppression.¹⁴

2 **Mycobacterium tuberculosis:** Cutaneous tuberculosis, although rare, can present as papulonodular lesions, ulcers, or scrofuloderma, particularly in endemic regions.¹⁴

Inflammatory Dermatoses

Inflammatory skin conditions are frequently observed in HIV-positive patients, often presenting with atypical and more severe clinical features compared to immunocompetent individuals.¹⁴

1 **Seborrheic**

Dermatitis:

Seborrheic dermatitis is one of the most common inflammatory dermatoses in HIV-positive patients, affecting up to 85% of individuals. It typically presents as erythematous, scaly patches involving the scalp, face, and upper trunk. In advanced HIV disease, the condition may become more severe and refractory to treatment.¹⁴

2 **Psoriasis:**

Psoriasis in HIV-positive patients often presents with severe, widespread plaques, erythroderma, or pustular

variants. The condition may be exacerbated by immune dysregulation and can be challenging to manage.¹⁴

3 **Eosinophilic Folliculitis:**

4 Eosinophilic folliculitis is a pruritic, papulopustular eruption that primarily affects the face, neck, and upper trunk. It is strongly associated with advanced HIV disease and is thought to result from immune dysregulation and hypersensitivity reactions.¹⁴

Neoplastic Dermatoses

Neoplastic conditions, particularly Kaposi's sarcoma, are hallmark dermatological manifestations of advanced HIV disease.¹⁵

1 **Kaposi's Sarcoma (KS):**

Kaposi's sarcoma, caused by human herpesvirus-8 (HHV-8), is the most common HIV-associated malignancy. It presents as violaceous macules, papules, or nodules on the skin, mucous membranes, and internal organs. Cutaneous lesions are often widespread and may coalesce into larger plaques or tumors.¹⁶

2 **Non-Melanoma Skin Cancers:**

HIV-positive patients are at increased risk for non-melanoma skin cancers, including basal cell carcinoma and squamous cell carcinoma. These lesions may present with aggressive growth patterns and higher rates of recurrence.¹⁷

Drug-Related Dermatoses

Adverse drug reactions, particularly to antiretroviral therapy (ART) and prophylactic medications, are common in HIV-positive patients. These reactions range from mild morbilliform rashes to severe, life-threatening conditions such as Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN).¹⁷

The clinical manifestations of dermatological reactions in HIV-positive patients are highly varied and often serve as critical indicators of disease progression and immune status. Early recognition and appropriate management of these conditions are essential for improving patient outcomes and quality of life. A thorough understanding of the diverse presentations of HIV-associated dermatoses enables clinicians to provide targeted and effective care, ultimately reducing the burden of dermatological morbidity in this vulnerable population.¹⁷

CONCLUSIONS

The dermatological reactions observed in patients infected with the Human Immunodeficiency Virus (HIV) represent a complex and multifaceted spectrum of conditions that reflect the intricate interplay between viral pathogenesis, immune dysregulation, and opportunistic infections. These cutaneous manifestations are not merely superficial concerns but are often critical indicators of the underlying immune status and disease progression in HIV-positive individuals. The diversity of dermatological reactions, ranging from infectious dermatoses and inflammatory conditions to neoplastic and drug-related eruptions, underscores the importance of a

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comprehensive and interdisciplinary approach to their diagnosis and management.

One of the most striking aspects of HIV-associated dermatological reactions is their ability to serve as early markers of HIV infection and immune suppression. Conditions such as seborrheic dermatitis, herpes zoster, and oropharyngeal candidiasis often precede the diagnosis of HIV, highlighting the need for heightened clinical suspicion and routine screening in patients presenting with these cutaneous findings. As the disease progresses and CD4⁺ T-cell counts decline, the severity and complexity of dermatological manifestations increase, with conditions such as Kaposi's sarcoma, disseminated fungal infections, and severe drug reactions becoming more prevalent.

The advent of antiretroviral therapy (ART) has profoundly altered the landscape of HIV-associated dermatological reactions. While ART has significantly reduced the incidence of severe opportunistic infections and neoplastic conditions, it has also introduced new challenges, such as immune reconstitution inflammatory syndrome (IRIS) and chronic inflammatory dermatoses. These evolving patterns emphasize the need for ongoing surveillance and adaptation of clinical strategies to address the changing needs of HIV-positive patients.

Geographic and socioeconomic factors further complicate the epidemiology and management of dermatological reactions in HIV-positive individuals. In resource-limited settings, where access to ART and diagnostic tools may be limited, dermatological conditions are often more severe and are associated with higher morbidity and mortality. In contrast, in high-income countries, the focus has shifted toward managing chronic inflammatory conditions and drug-related adverse reactions, reflecting the success of ART in prolonging life expectancy and improving overall health outcomes.

The management of dermatological reactions in HIV-positive patients requires a holistic and patient-centered approach. Early diagnosis, prompt initiation of ART, and targeted treatment of specific dermatoses are essential for improving outcomes and reducing complications. Additionally, preventive measures, such as vaccination against preventable infections and routine skin examinations, play a crucial role in minimizing the burden of dermatological morbidity.

In conclusion, dermatological reactions in HIV-positive patients are a window into the systemic effects of HIV infection and immune suppression. Their clinical presentations are diverse and dynamic, reflecting the evolving nature of HIV disease in the era of ART. By understanding the underlying mechanisms, epidemiological trends, and clinical features of these conditions, healthcare providers can optimize care, enhance patient outcomes, and improve the quality of life for individuals living with HIV. Continued research, education, and advocacy are essential for addressing the ongoing challenges posed by HIV-associated

dermatological reactions and for advancing the global response to the HIV/AIDS pandemic.

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