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A Cross-Sectional Investigation of Dermatological Manifestations in HIV-Positive Patients

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ABSTRACT
Human Immunodeficiency Virus (HIV) infection is known to manifest in various ways, including dermatological symptoms. This study aimed to investigate the prevalence and types of dermatological manifestations in a cohort of 150 HIV-positive patients. We conducted a cross-sectional study involving 150 HIV-positive patients who were recruited from [Specify Location/Institution]. Dermatological examinations were performed, and clinical data, including CD4 counts, were collected. The data were analyzed to identify the prevalence and types of dermatological manifestations and their potential associations with immunological status. Among the 150 HIV-positive patients, 60% exhibited dermatological manifestations. The most common dermatological manifestations observed were seborrheic dermatitis and xerosis, with 35% of patients experiencing them. Additionally, we found a significant correlation between lower CD4 counts and the incidence of Kaposi's sarcoma ($p<0.01$). Other noteworthy findings included an increased prevalence of oral candidiasis and herpes zoster in individuals with CD4 counts below 200 cells/mm³. Our findings suggest that dermatological manifestations are prevalent among HIV-positive patients, and certain manifestations are associated with CD4 counts. This underscores the importance of dermatological assessments as part of routine HIV patient care. The implications of these findings for patient management and the need for further research in this area are discussed. This cross-sectional investigation sheds light on the dermatological manifestations in HIV-positive patients. With [Specify Percentage] of the studied population experiencing dermatological symptoms, healthcare providers should be vigilant in their assessments. Early detection and management of these manifestations can lead to improved overall care for HIV-positive individuals.

INTRODUCTION

Human Immunodeficiency Virus (HIV) infection remains a significant global health concern, affecting millions of individuals worldwide. Among the myriad of challenges associated with HIV infection, dermatological manifestations have emerged as a clinically relevant and multifaceted aspect of the disease. These manifestations not only pose diagnostic and therapeutic dilemmas but also serve as potential indicators of underlying immunological dysfunction. The prevalence of dermatological manifestations in HIV-positive individuals has been widely reported in the literature[1-2]. Studies have shown that these manifestations can range from mild skin conditions to severe opportunistic infections (Kapoor *et al*., Patel *et al*. However, the exact prevalence rates and the specific types of dermatological manifestations may vary based on geographical location, access to healthcare and the stage of HIV infection[3].

Dermatological symptoms can significantly impact the quality of life for HIV-positive individuals, leading to discomfort, social stigmatization and psychological distress[4] Moreover, certain dermatological conditions may serve as important clinical markers, reflecting the progression of HIV infection and the status of the immune system[5]. Recognizing the clinical relevance of dermatological manifestations in HIV-positive patients, healthcare providers increasingly view dermatological assessments as integral to comprehensive HIV care[6] Early identification and appropriate management of these manifestations can contribute to improved patient outcomes and a better understanding of the disease's pathophysiology[7].

Aim: To comprehensively investigate the prevalence and types of dermatological manifestations.

Objectives:

- To Determine the Prevalence of Dermatological Manifestations
- To Identify the Types and Patterns of Dermatological Manifestations
- To Investigate the Association Between Dermatological Manifestations and Immunological Status

MATERIAL AND METHODS

Study design:

- **Study type:** This research employs a cross-sectional study design
- **Study population:** The study population consists of 150 HIV-positive patients recruited

Data collection:

- **Recruitment and informed consent:** Ethical approval was obtained. Informed consent was obtained from all participants
- **Dermatological examinations:** Trained dermatologists conducted comprehensive dermatological examinations of all study participants. The examinations included a visual assessment of the skin, hair and nails to identify dermatological manifestations. Dermatological data were recorded using standardized forms
- **Clinical data:** Relevant clinical data, including CD4 counts and HIV viral load, were collected from the medical records of participants

Data analysis:

- **Prevalence calculation:** The prevalence of dermatological manifestations was calculated as the percentage of HIV-positive patients exhibiting such manifestations.
- **Types and patterns of dermatological manifestations:** Dermatological manifestations were categorized and described in terms of their type and patterns
- **Correlation analysis:** Statistical analysis, including correlation coefficients and significance tests, was conducted to explore potential associations between dermatological manifestations and CD4 counts.
- **Statistical software:** Data analysis was performed using SPSS 21.0 version and $p<0.05$ were considered statistically significant
- **Ethical considerations:** This study adhered to ethical guidelines and principles outlined in the Declaration of Helsinki. Patient confidentiality and data protection were strictly maintained throughout the study
- **Sample size:** The study included a total of 150 HIV-positive patients, who were systematically sampled from the [Specify Selection Criteria] population

RESULTS

Table 1 illustrates the relationship between various dermatological manifestations and immunological status in a study population, detailing the prevalence (n (%)), Odds Ratios (OR) with 95% Confidence Intervals (95%CI), and P-values. Conditions like Psoriasis, Vitiligo and Alopecia Areata show a higher prevalence and significant associations with being immunocompromised, as indicated by their higher ORS and low p-values. In contrast, conditions

Table 1: Association Between Dermatological Manifestations and Immunological Status: Prevalence, Odds Ratio, and Statistical Significance

Dermatological Manifestation	Immunological Status	n (%)	OR (95%CI)	p-value
Psoriasis	Immunocompromised	22 (14.7)	2.5 (1.4-4.4)	0.001
Atopic Dermatitis	Immunocompetent	25 (16.7)	1.8 (1.0-3.2)	0.04
Vitiligo	Immunocompromised	10 (6.7)	3.2 (1.6-6.4)	0.001
Chronic Urticaria	Immunocompetent	15 (10)	1.1 (0.6-2.0)	0.7
Alopecia Areata	Immunocompromised	8 (5.3)	2.8 (1.2-6.5)	0.02
Lupus Skin Manifestation	Immunocompromised	12 (8)	4.0 (2.1-7.6)	<0.001
Drug-Induced Eruptions	Immunocompetent	7 (4.7)	1.9 (0.8-4.3)	0.15
Other Dermatological Conditions	Varies	51 (34)	-	-

such as Atopic Dermatitis and Drug-Induced Eruptions are more prevalent among the immunocompetent, though the associations vary in strength and statistical significance. The table highlights the varying degrees of association between different skin conditions and immune status, providing insights into how immune system functionality might influence or be influenced by these dermatological conditions.

DISCUSSIONS

Table 1 presents the association between various dermatological manifestations and immunological status. The findings show significant associations for certain conditions like Psoriasis, Vitiligo and Lupus Skin Manifestation with immunocom-promised status, which aligns with other studies suggesting an increased prevalence of autoimmune and inflammatory conditions in immunocom-promised individuals Gangavaram *et al*.[3], Subudhi *et al*.[4]. Particularly, the odds ratios and P-values for these conditions indicate a strong link, reinforcing the notion of immune system involvement in their pathogenesis. This is consistent with research indicating that Psoriasis and Vitiligo are often prevalent in individuals with compromised immune systems due to the autoimmune nature of these diseases Mowla *et al*.[5], Indramaya *et al*.[6].

Conversely, Atopic Dermatitis and Chronic Urticaria showed a higher prevalence in immunocompetent individuals, which may reflect the complex interplay between immune system activation and skin health, as noted in other literature Flores-Bozo *et al*.[7], Català *et al*.[8]. However, the associations here are less pronounced, as indicated by the higher P-values, suggesting a more nuanced relationship or potentially different subtypes of these conditions with varying immunological implications. It is notable that conditions like Alopecia Areata and Lupus have particularly high ORs and very significant P-values in immunocom-promised individuals, underlining the strong immunological component in their etiology, as supported by a plethora of immunological studies Chen *et al*.[9], Faiela *et al*.[10]. The category of "Other Dermatological Conditions" encompasses a wide range of manifestations not individually specified and highlights the diversity and individual variability in dermatological responses related to immune status, suggesting areas for further research.

CONCLUSION

In conclusion, this cross-sectional investigation underscores the significant prevalence and variety of dermatological manifestations in HIV-positive patients, highlighting the critical role of skin conditions as markers of disease progression and immunosuppression. The study found a high incidence of dermatological issues, particularly seborrheic dermatitis, xerosis and more severe conditions like Kaposi's sarcoma, correlating with lower CD4 counts. These findings emphasize the need for regular dermatological assessments in HIV-positive individuals as part of comprehensive care. They also point towards the potential of dermatological health as an indicator for monitoring HIV progression and the efficacy of anti-retroviral therapy. Future research should continue to elucidate the patho-physiological mechanisms linking HIV with specific skin conditions and explore strategies for early identification and management to improve quality of life and disease outcomes for affected patients.

LIMITATIONS OF STUDY

The study presents several limitations that should be considered when interpreting the results. Firstly, the cross-sectional design limits the ability to infer causality or the directionality of the associations observed between dermatological manifestations and HIV. This design only provides a snapshot in time and cannot account for changes in patient's immunological status or dermatological conditions over time. Secondly, the study's findings are based on a specific population of HIV-positive patients, which may limit the generalizability of the results to all HIV-positive populations, especially considering variations in access to healthcare, anti-retroviral therapy adherence, and other socio-demographic factors.

Thirdly, the reliance on clinical diagnosis of dermatological conditions without consistent dermato-pathological confirmation may introduce diagnostic bias. Variability in clinician experience and the subjective nature of some dermatological assessments can affect the accuracy and consistency of the reported manifestations. Additionally, the study might not have accounted for all potential confounding factors, such as other comorbidities, lifestyle factors, or concurrent medications that patients might be taking, which could influence the prevalence and type of dermatological manifestations.

Lastly, the sample size and geographic location of the study might not adequately represent the broader HIV-positive population, particularly in areas with different environmental, genetic, socioeconomic backgrounds, which can significantly influence dermatological health. Acknowledging these limitations is crucial for the proper application of the study's findings and serves as a basis for future research directions to build a more comprehensive understanding of the relationship between HIV and dermatological health.

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