

# Dermatophytoses Features in HIV/AIDS Patients at Haji Adam Malik General Hospital Medan

Febrina Tritama Kurniasih\*, Meidina Kusuma Wardani\*\*, Lukmanul Hakim Nasution\*\*

\*Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

\*\*Departement of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

DOI: 10.29322/IJSRP.9.11.2019.p9521

<http://dx.doi.org/10.29322/IJSRP.9.11.2019.p9521>

**Abstract- Introduction:** Dermatophytosis are superficial fungal infection of the hair, nail and skin. Causative organisms include fungi in the *Trichophyton*, *Microsporum*, dan *Epidermophyton*. Fungal infections can occur in all immune statuses, both in immunocompetents and immunocompromaise condition such as in patients with HIV/AIDS.

**Objectives:** To determine dermatophytosis features in HIV/AIDS Patients

**Methods:** It was a descriptive study with cross-sectional design which involved 32 dermatophytosis in HIV/AIDS patients from June to August 2019 at Pusyansus in H. Adam Malik General Hospital Medan. Diagnosis was made based on history, clinical examination, and a direct microscopic examination using 10%-20% KOH solution of scraping skin, hair and nails.

**Results:** HIV/AIDS patients most dermatophytosis are found mostly in man 24 people (75%), in the group of age 36-45 years (40,63%), senior high school (50%), the most diagnosis is tinea pedis, level CD4<sup>+</sup> 200-400 cells/mm<sup>3</sup> are 14 people (43,8%). The duration of 1 – 3 years suffering from HIV/AIDS is 10 people (31,3%)

**Conclusion:** Tinea pedis is the most common type of dermatophytosis found in this study, followed by tinea corporis and tinea facialis. The incidence of dermatophytosis is not significantly affected by HIV / AIDS status.

**Index Terms-** dermatophytosis, human immunodeficiency virus, tinea pedis

## I. INTRODUCTION

Human immunodeficiency virus (HIV) is a virus that attacks the body's immune system, CD4<sup>+</sup>. Acquired-immunodeficiency syndrome (AIDS) is an immunosuppressive condition (syndrome) that is closely related to various opportunistic infections, neoplasms, and certain neurogenic manifestations due to HIV infection.<sup>1,2</sup>

Dermatophytosis often occurs in HIV / AIDS patients where fungal growth is associated with an imbalance in the host immune system. Some fungal infections, such as dermatophytosis, give nonspecific symptoms that require a more thorough examination. Dermatophytosis which attacks the skin, nails and hair keratin, is a fungus that is often found in HIV disease.<sup>3,4</sup> Tinea pedis, tinea cruris, tinea corporis and onychomycosis show a prevalence rate four times higher in HIV / AIDS patients than in the normal

population. The complaints and clinical features of dermatophytosis are highly variable in HIV patients.<sup>5,6</sup>

According to Lemak et al that the incidence of dermatophytosis in HIV patients is recorded at 15–40%.<sup>7</sup> The most common clinical form of this disorder is proximal subungual onychomycosis (PSO).<sup>6,7</sup> From the annual report in the Mycology Division of dermatovenereology department Dr. Soetomo Surabaya in 2012 found that 2.9% of dermatophytosis cases in non-HIV patients, and 3.0% of dermatophytosis cases is founded in non-HIV patients in 2013.<sup>9</sup>

Some predisposing factors for dermatophytosis such as hot climate, high humidity, poor hygiene, contact with animals, obesity, and immunocompromised conditions caused by HIV / AIDS, long-term use of corticosteroids, and diabetes mellitus.<sup>10,11</sup>

The clinical features of dermatophytosis in HIV patients is not specific, it is not always itchy, but it can spread throughout the body and often recurrent. At the AIDS stage, there is no inflammatory reaction or central clearing (tinea anergic). This situation can be the basic for knowing the clinical sign of dermatophytosis at CD4<sup>+</sup> levels at examination.

## II. METHODS

This study is a descriptive study with cross-sectional design, that involved 32 HIV / AIDS patients who had been diagnosed with dermatophytosis from June 2019 to August 2019. The basic data of all patients were recorded such as patient identity, history taking, physical examination and dermatology examination by researchers at Pusyansus H. Adam Malik General Hospital Medan. Sampling of skin scrapings is done by microbiology laboratory staff of RSUP HAM.

This study has been approved by Health Research Ethics Commission of the Faculty of Medicine, Universitas Sumatera Utara/ H. Adam Malik General Hospital Medan.

## III. RESULTS

Characteristics of the study subjects were the number of subjects suffering from dermatophytosis with HIV / AIDS, there 24 men (75%) and 8 women (35.0%), most in the 36-45 years age group, there 13 people (40.63%), senior high school is 16 people (50%) and self employment is 14 people (43.8%), the proportion of the duration of HIV / AIDS is 1 - 3 years, found 10 people (31.3%). CD4<sup>+</sup> T-cells counts of dermatophytosis patients with

HIV / AIDS are CD4<sup>+</sup> T-cells ranging from 200-400 cells/mm<sup>3</sup>, there 14 people (43.8%). The most clinical type of dermatophytosis in HIV / AIDS patients is tinea pedis, found 16 people (50, 0%). (Table 1)

In this study that the clinical manifestation of dermatophytosis based on CD4<sup>+</sup> levels showed > 400 cells/mm<sup>3</sup>

found 9 people followed by CD4<sup>+</sup> level 200-400 cells/mm<sup>3</sup> is 7 people in case of tinea pedis, whereas at CD4<sup>+</sup> levels <200 cells/mm<sup>3</sup> obtained some cases of tinea corporis dan tinea facialis are 3 people. (Table 2)

Characteristic		Number of cases	Percentage of cases
Gender	Male	24	75.0
	Female	8	35.0
Age	17 – 25 years	0	0
	26 – 35 years	9	28.13
	36 – 45 years	13	40.63
	46 – 55 years	3	9.38
	>55 years	7	21.86
Education level	Elementary school	3	9.4
	Junior highschool	7	21.9
	Senior highschool	16	50.0
	University	6	18.8
Occupation	Unemployed	1	3.1
	Civil service	4	12.5
	Office worker	3	9.4
	Self employment	14	43.8
	Farmer	4	12.5
	Housewife	6	18.7
Duration of HIV disease	< 6 months	5	15.6
	6 months – 1 year	4	12.5
	1 – 3 years	10	31.3
	3 – 5 years	8	25.0
	>5 years	5	15.6
CD4 <sup>+</sup> T-lymphocyte count	< 200 cells/mm <sup>3</sup>	9	28.1
	200-400 cells/ mm <sup>3</sup>	14	43.8
	>400 cells/ mm <sup>3</sup>	9	28.1
Type of Dermatofitosis	Tinea capitis	1	3.1
	Tinea corporis	5	15.6
	Tinea facialis	5	15.6
	Tinea pedis	16	50.0
	Onichomycosis	1	3.1
	Tinea corporis + Tinea pedis	1	3.1
	Tinea pedis + Onichomycosis	3	9.4

Clinical variant of dermatophytoses	CD4 <sup>+</sup> T-lymphocyte count			Total
	< 200 cells/mm <sup>3</sup>	200-400 cells/ mm <sup>3</sup>	>400 cells/ mm <sup>3</sup>	
Tinea capitis	0	1	0	1
Tinea corporis	3	2	0	5
Tinea facialis	3	2	0	5
Tinea pedis	0	7	9	16
Onichomycosis	1	0	0	1
Tinea corporis + Tinea pedis	1	0	0	1
Tinea pedis + Onichomycosis	1	2	0	3
<b>Total</b>	<b>9</b>	<b>14</b>	<b>9</b>	<b>32</b>

#### IV. DISCUSSION

In this study, it was found that from 32 samples of HIV / AIDS patients with dermatophytosis, there were 24 male (75%) and 8 female (35.0%).

The study of Hanum et al. at Pusyansus H. Adam Malik General Hospital found that most of superficial fungal infections patients with HIV/AIDS were male (67.1%) and female (32.9%).<sup>12</sup> This is according to Costa et al. found in men (61%) and women (24%).<sup>13</sup> Study by Kaviarasan et al. found that dermatophytosis with HIV/AIDS was 22% where male and female ratio is 3: 1.<sup>14</sup> The most of HIV/AIDS patients in this study was male, in the heterosexual group and injection drug using as risk factor. This is consistent with data from the Ministry of Health of the Republic of Indonesia in 2018, where HIV/AIDS infection predominantly occurs in heterosexual and injecting drug users groups and an increase in the number of HIV/AIDS infections in the "Men having Sex with Men" group (MLM).<sup>15</sup>

The most subjects in this study is in the age group 36-45 years were 13 people (40.63%). Which Rosvanti et al. in Surabaya get the result that the youngest patient is 23 years old and the oldest is 38 years old with the age range of patients in 25-54 years is 5 people (100%).<sup>6</sup> This is consistent with data from the Ministry of Health PP&PL of the Republic of Indonesia in 2018, where HIV infection tends to increase and most occurs in the productive age group, there the age group 25-49 years (69.9%) and followed by the age group 20-24 years (15.6%).<sup>15</sup>

Kaviarsan et al. found that the most age group in dermatophytosis with HIV / AIDS is 21-30 years by 50%.<sup>14</sup>

Based on the level of education of HIV/AIDS sufferers, most are middle-high, there 16 people (50%). In accordance with the results of study conducted by Hanum in Pusyansus H. Adam Malik Hospital, most dermatophytosis sufferers at the senior high school education 57 people (78.1%) followed by elementary school education 12 people (16.4%).<sup>12</sup> while Rosvanti et al in Surabaya also found the most sufferers at the senior high school, 3 people (60%) and the junior high school, 2 people (40%).<sup>6</sup>

According to the job of patients who come for treatment, most of them work as entrepreneurs, there 14 people (43.8%). In accordance with study conducted by Hanum et al. where the most kind of job in patients with superficial fungal infections with HIV/AIDS is 29 entrepreneurs (39.7%).<sup>12</sup>

Rajesh et al. in India (2006) most HIV/AIDS sufferers with dermatophytosis have jobs that do not require expertise or semi expertise, followed by the work as a farmers and drivers. Women are mostly housewives so that the tendency for HIV disease can occur in all community groups.<sup>16</sup>

In this study that the length of suffering from HIV / AIDS with dermatophytosis is 1-3 years as many as 10 people (31.3%). Rajesh et al. get  $\geq 6$  months is 38 people (67.86%) and  $\leq 6$  months is 18 people (32.14%)<sup>16</sup> and Costa et al get  $\geq 1$  year (41%),  $\leq 2$  months (35%) and 2 months - 1 year (23%).<sup>13</sup>

Based on CD4<sup>+</sup> cells counts, most subjects suffered from dermatophytosis in the group of CD4 T-cells counts ranging from 200-400 cells / mm<sup>3</sup>, is 14 people (43.8%). This is not in accordance with Rosvanti et al study of HIV/AIDS patients suffering from dermatophytosis in dr. Soetomo General hospitals, where the most subjects in the group with a CD4<sup>+</sup> T-cells count of  $\leq 200$  cells / mm<sup>3</sup>.<sup>6</sup>

Gniadek et al in Brazil got CD4 T-cells results of  $\leq 199$  cells/mm<sup>3</sup> of 60 people (14.3%), followed by 200 - 499 cells/mm<sup>3</sup> of 35 people (10%)<sup>17</sup> and Zewdu et al in Ethiopia got results the highest CD4<sup>+</sup> T-cells count with a CD4<sup>+</sup> count of  $\leq 200$  cells/mm<sup>3</sup> is 11%.<sup>18</sup>

The pathogenic mechanisms for the occurrence of anergic, extensive or multiple lesions of dermatophytosis in HIV patients are not yet clear. Some authors hypothesized that loss of function in CD4<sup>+</sup> T lymphocytes, changes in the balance between Th1 and Th2 immune responses and damage to cellular immunity, which occur in the progression of HIV infection, could explain the occurrence of these peculiar clinical presentations. The degree of inflammation at the site of fungal infection is one of the determinants of the clinical expression, and is dependent on the predominance of humoral or cellular immune response. This hypothesis are supported by the fact that, although dermatophytosis can occur throughout the HIV infection, most of the reported cases of extensive or atypical lesions have occurred in patients with compromised immunological status, with CD4<sup>+</sup> T lymphocyte count below 100 cells/mm<sup>3</sup> or with opportunistic diseases which characterize the AIDS stage of the HIV infection.<sup>13</sup> The clinical signs of dermatophytosis with HIV/AIDS was tinea pedis, 16 people (50.0%) followed by tinea corporis and tinea pedis, each 5 people (15.6%).

Study by Ali et al in India found the most cases of dermatophytosis 42% with tinea cruris followed by tinea corporis in 18% of the cases.<sup>19</sup>

Study by Kaviarsan et al. get the most cases of dermatophytosis, 22 (53.7%) cases with tinea corporis, followed by tinea cruris in 18(49.9%), tinea pedis in 7 (17.1%), tinea facialis in 6 (14.7%) and 1 patient with tinea manum.<sup>14</sup> Whereas the study of Zewdu et al obtained the highest number of types of dermatophytosis with HIV / AIDS, is tinea capitis (19.6%), onychomycosis (23.5%), and tinea corporis (12.5%).<sup>18</sup>

The study by Kheira et al in Aljazair (2007) which obtained a higher frequency of dermatophytosis, is tinea pedis as much as 45.25%.<sup>20</sup> Moya-Salajar et al got the most results is tinea pedis as much as 70.6%.<sup>21</sup>

According to research reports Kumarasamy et al. there were no clinical differences in HIV patients compared to the non HIV patients.<sup>22</sup>

The clinical variant of dermatophytosis based on CD4<sup>+</sup> levels showed  $>400$  cells/mm<sup>3</sup> found 9 people followed by CD4<sup>+</sup> levels 200-400 cells/mm<sup>3</sup> is 7 people in tinea pedis cases. The study by Ali et al which obtained at the clinical materials to mycological examination, the number of CD4<sup>+</sup> varied from 100 to 1015 cells/mm<sup>3</sup>. Patients with CD4<sup>+</sup> cell count between 200-499 dominated. It was also found that the number of CD4<sup>+</sup> T-cells does not influence the occurrence of dermatophytosis.<sup>19</sup>

#### V. CONCLUSION

Tinea pedis is the most common type of dermatophytosis found in this study, followed by corporis tinea and facialis tinea, with a CD4<sup>+</sup> T-cells count of 200-400 cells/mm<sup>3</sup>. The incidence of dermatophytosis was significantly unaffected by HIV / AIDS status.

## REFERENCES

- [1] Moss JA. HIV/AIDS Review. Radiologic technology.2013;84(3):247-67.
- [2] Fauci AS, Lane HC. Human Immunodeficiency Virus Disease: AIDS and related disorder. In: Kasper DL, Fauci AS, Longo DL, Braunwald E, Hays RD, Jameson JL. editors. Harrison's Principle of Internal Medicine. 17<sup>th</sup> ed. The United States of America: McGraw-Hill:241-50.
- [3] Venkatesan P, Perfect JR, Myres SA. Evaluation and management of fungal infection in immunocompromised patient. Dermatologic therapy.2005; 18(1):44-57.
- [4] Woodfolk JA. Allergy and dermatophytes. Clinical microbiology review. 2005; 18(1):30-43.
- [5] Johnson RA. Dermatophyte infection in human deficiency virus (HIV) disease. Journal of the American Academy of Dermatology.2000; 43(5): S135-142.
- [6] Rosvanti A, Suyoso S, Murtiastutik D. Profil manifestasi klinis dan spesies penyebab dermatofitosis pada pasien HIV. Berkala Ilmu Kesehatan Kulit dan Kelamin. 2010; 22(2):97-101
- [7] Lemak NA, Duvic M. Superficial fungal infections in HIV and AIDS. Dermatologic Therapy. 1997 Dec 1;3:84-90
- [8] Putri AI, Astari L. Profil dan Evaluasi Dermatofitosis. Berkala Ilmu Kesehatan Kulit dan Kelamin. 2017;29(2):135-41.
- [9] Lohoué Petmy J, Lando AJ, Kapteu L, Tchinda V, Folefack M. Superficial mycoses and HIV infections in Yaonde. Journal of the European Academy of Dermatology and Venerology.2004;18(3):301-4
- [10] Pires CAA, Lobato AM, Carneiro FRO, et al. Clinical Epidemiological and Therapeutic Profile Dermatophytosis. Anais Brasileiros de dermatologia. 2014;89(2):259-64.
- [11] Tilak R, Prakash P, Nigam C, Gupta R. Tinea Pedis an update. Asian Journal of Medical Science.2011;2(2):134-8.
- [12] Hanum SYM, Nasution LH, Wardani MK. Hubungan Kadar CD4 dengan Infeksi Jamur Superfisialis pada Penderita HIV di RSUP H. Adam Malik Medan. [tesis]. Medan: Universitas Sumatera Utara;2009.
- [13] Costa JEF, Neves RP, Delgado MM, Lima-Neto RG, Morais VMS, Coleho MRCD. Dermatophytosis in patients with human immunodeficiency virus infection: clinical aspect and etiologic agents. Acta Tropica.2015;150:111-115.
- [14] Kaviarasan PK, Jaisankar TJ, Thappa DM, Sujatha S. Clinical Variations In Dermatophytosis In HIV Infected Patients. Indian Journal Of Dermatology, Venereology, And Leprology.2002; 68(4): 213.
- [15] Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia. Data dan Informasi Tahun 2018. Available from: [http://siha.depkes.go.id/portal/files\\_upload/Laporan\\_Triwulan\\_IV\\_2018.pdf](http://siha.depkes.go.id/portal/files_upload/Laporan_Triwulan_IV_2018.pdf)
- [16] Rajesh R, Subramanian K, Padmavathy BK, Vasanthi S. Prevalence and Spesies Profile of Dermatophytosis Among Positive Patients in Rural Referral Centre. Indian Journal of Sexually Transmitted Disease. 2006;27(2): 70-74.
- [17] Gniadek A, Skóra M, Garlicki A, Gadek A, Macura, A. B. Prevalence of dermatophytes in interdigital spaces in HIV patients. Postepy Dermatologii i Alergologii. 2012;29(1): 30.
- [18] Zewdu FT, Kindeneh M, Tesfaye DM, Yenit MK, Dessie M. Magnitude and Associated Factors of Superficial Fungal Infections on HIV/AIDS Patients Who Attends in Debreabor General Hospital ART Clinic, Debreabor, North West Ethiopia, 2015/16. International Journal of Clinical & Experimental Dermatology. 2016; 1(1):1-11.
- [19] Ali SY, Gajjala SR, Raj A. Study of prevalence of dermatophytes among human immunodeficiency virus/AIDS patients in Shadan Institute of Medical Science and Teaching Hospital and Research Centre, Hyderabad, Telangana, India. Indian Journal of sexually transmitted disease and AIDS.2018;39(2): 98-101.
- [20] Kheira H, Selselet AG, Bensoltane SA. Dermatophytes in North West of Algeria: a prospective study. Middle-East Journal of Scientific Research.2007;2(3-4):104-106
- [21] Moya-Salazar J, Salazar-Hernández R, Rojas-Zumaran V, Quispe WC. Fungal Infections in HIV-positive Peruvian Patients: Could the Venezuelan Migration Cause a Health Warning Related-infectious Diseases?. Journal of Infectiology. 2019;2(2): 3-10.
- [22] Kumarasamy, N., Solomon, S., Paul, S. J., Venilla, R, Amalraj RE. Spectrum of opportunistic infections among AIDS patients in Tamil Nadu, India. International journal of STD & AIDS,1995; 6(6): 447-449.

## AUTHORS

**First Author** – Febrina Tritama Kurniasih, Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, [tritama28@gmail.com](mailto:tritama28@gmail.com)  
**Second Author**- Meidina Kusuma Wardani. Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara  
**Third Author**- Lukmanul Hakim Nasution, Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara