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Clinico-mycological profile of onychomycosis in HIV patients at a tertiary care centre, Kakinada

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Abstract: *Introduction: The prevalence of onychomycosis is about 15-40% in HIV infected individuals and is one of the earliest manifestations of HIV infection. Multiple nail involvement, rapid spreading nature to hands and feet, high frequency of proximal subungual type, high resistance to the treatment, isolation of common and rare species characterizes onychomycosis in HIV. Aim: To study the epidemiology, clinical pattern of onychomycosis in HIV infected individuals with special emphasis to common site affected, type of onychomycosis and to identify the various causative organism microbiologically. Materials and methods: 38 clinically diagnosed cases of HIV in a period of 1 year were included in the study. Patients were clinically examined for the type and pattern of nail involvement. Nail clippings were sent for KOH direct microscopy and fungal culture and results obtained were statistically analyzed using SPSS 20.0. Results: Out of 38 HIV infected patients clinically suspected with onychomycosis, 25 were males and 13 were females; Majority were in the age group between 21-30 years; Half of the (50.00%) patients had the disease for less than 1 year. In majority of HIV positive patients 14(46.67%) the CD4 count was between 401-500 cells /µl. 13(43.33%) patients had other associated fungal infections. Most of the patients 30 (73.33%) were asymptomatic while 8(26.67%) patients complained of pain and discoloration of nail plates were seen in all cases. Paronychia and subungual hyperkerotosis were seen in 16.67% and 50.00% of the patients respectively. Finger nails were affected more than toe nails. Distal Lateral Subungual Onychomycosis was the most common clinical types seen in 14(46.66%) patients followed by Proximal Subungual Onychomycosis 6(20.00%) and Candidal onychomycosis 5(16.67%). Out of 38 clinical suspected cases, 30(78.95%) were positive for fungus on direct microscopic examination or culture or by both. Trichophyton rubrum(33.33%), Trichophyton mentagrophytes (33.33%), Candida albicans (16.67%) and Aspergillus species (10.00%) were the important species isolated.Conclusion: Distal lateral Subungual Onychomycosis was the most common type observed in our study and Trichophyton rubrum was the predominant causative organism.*

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I. Introduction

Onychomycosis is a common fungal infection of nail plate caused by dermatophytes, non dermatophytes, molds & yeast. Tinea unguium on the other hand refers specifically to infection caused by dermatophytes. Onychomycosis is distributed worldwide with prevalence of 3% to 9%. It is generally considered as a disease of middle aged & elderly, affecting a large & significant number of people. There has been a recent increase in the incidence as well as a spectrum of causative pathogens associated with onychomycosis. This increase in the incidence can be attributed to various factors like an aging population, use of immunosuppresive drugs, spread of HIV infection and changing life styles. Onychomycosis is more common in HIV patients. Prevelence of onychomycosis among HIV patients ranges from 15% to 40%[1, 2, 3, 4] and may be directly related to the degree of immunosuppression[5]. It can be an early manifestation of immunosuppression & is more frequent when CD4 cell count approaches 450 cells/ microL[6]. Onychomycosis associated with HIV is clinically more aggressive with a higher frequency of unusual presentation and therapeutically more difficult to treat[7]. Studies worldwide have shown that onychomycosis is present in different forms in different parts of the world, showing great differences not only between different countries and different climatic zones, but also between different regions of the same country[8]. The present study is an attempt to know the prevalence and clinico mycological factors related to onychomycosis among HIV patients in and around Kakinada.

II. Materials and method

This prospective observational study was carried out on 38 people living with HIV/AIDS previously and newly diagnosed who attended the Department of DVL and ART Centre, Government general hospital Rangaraya Medical College Kakinada for the period of 1 year. Patients were clearly explained about the nature of the study and a written consent was taken for their participation in this study.

Complete demographic data and clinical history related to the disease were obtained. Patients were thoroughly examined for nail changes, associated systemic or skin diseases, especially the presence of mycotic infections elsewhere on the body were noted. Routine investigations along with CD4 counts were done for all the patients included in the study.

Nail samples proximally as possible till the junction of healthy nail with the diseased nail were collected aseptically using a sterile nail clipper. When both finger nails and toe nails were affected, scrapings were collected from both the sites.

Direct microscopy of nail clippings with 20% potassium hydroxide done and observed after 1-2 hours for the presence of fungal hyphae and spores. The remaining nail material was inoculated directly into 4 bottles of Sabouraud's dextrose agar and was observed on the 3rd and 4th day, thereafter on alternate days for the presence of fungal growth for a total period of 4 weeks, after which they were discarded if there was no growth. Macroscopic examination of colonies for colony morphology, texture, surface pigmentation, pigmentation on the reverse and microscopic examination of colonies and microscopic examination of colonies for presence of hyphae, pseudohyphae, conidia and chlamydospore morphology were done.

Following criteria were employed before reporting a non-dermatophytic mould as an isolate from the nail.

- Presence of fungus form the scrapings under direct microscopy
- Isolation of fungus in culture on three consecutive occasions, at a minimum interval of 7 days each.

In cases where candida species were isolated, germ tube test was done and in addition the suspected strain of Candida was grown on corn meal agar.

III. Results

In the present study, Out of 38 HIV infected patients clinically suspected with onychomycosis, 25 were males and 13 were females; Majority were in the age group between 21-30 years (Table 1); Out of 25 male patients 12 were manual labourers and 10 were farmers. Out of 13 female patients 9 were house-wives and 4 were farmers(Table 2). Out of 30 patients 4(9.3%), 2(2.33%), and 4(15.12%) had a past history of T.manuum, T.pedis and trauma respectively. 28 use common bath rooms or communal bathing facilities (Table 3). Duration of the disease varied from 3 months to 12 years. Half of the (50.00%) patients had the disease for less than 1 year. In majority of HIV positive patients 14 (46.67%) the CD4 count was between 401-500 cells /µl (Table 4). 13 (43.33%) patients had other associated fungal infections. Most of the patients 22 (73.33%) were asymptomatic while 8 (26.67%) patients complained of pain and discoloration of nail plates were seen in all cases (Table 5). Paronychia and subungual hyperkerotosis were seen in 16.67% and 50.00% of the patients respectively. Finger nails18 (60.00%) were affected more than toe nails 8 (26.67%). Unilateral involvement was seen in 16 (53.33%) patients, compared to 14(46.67%)patients with bilateral involvement (Table 6).

Distal Lateral Subungual Onychomycosis was the most common clinical types seen in 14 (46.66%) patients (Figure 3) followed by Proximal Subungual Onychomycosis 6 (20.00%) (Figure 5) and Candidal onychomycosis 5(16.67%) (Figure 1). Out of 38 clinical suspected cases, 30 (78.95%) were positive for fungus on direct microscopic examination or culture or by both and the remaining 8 (21.05%) cases were negative (Table 7). Fungus was grown on culture in a total of 30 (78.95%) cases, out of 38 clinically suspected cases. Trichophyton rubrum(33.33%) (Figure 6&7), Trichophyton mentagrophytes (33.33%) (Figure 8&9), Candida albicans (16.67%) (Figure 12&13) and Aspergillus species (10.00%) were the important species isolated (Table 8).

Table 1: Age and Gender distribution of HIV infected patients

Age in years	Male	Female	Total	Percentage
11-20	0	0	0	0
21-30	14	7	21	55.26
31-40	7	4	11	28.94
41-50	3	2	5	13.15
51-60	0	0	0	0
>60	0	0	0	0
Total	25	13	38	100.00

Table 2: Distribution of patients according to their occupation

OCCUPATIONAL CATEGORY	HIV PATIENTS
I. Associated with wet work	
Housewives	3
Hotel workers	2
Fisher men	0
Cooks	0
Washer women	0
Total	**5**
II.Associated with increased physical activity	

Farmers	
Labourers	8
Painters	10
Mechanics	1
Tailors	4
Gardners	2
	0
Total	**25**
III.Others	
Office personnel	0
Business men	4
Students	0
Professionals	0
No specific occupations	4
Total	**8**

Table 3: Predisposing factors among the patients

Predisposing Factor	HIV	Percentage
Past H/o:T.manuum	4	9.3
:T.pedis	2	2.33
:Trauma	4	15.12
Use of Occlusive footwear	1	9.3
Use of Common bathrooms/ Communal bathing facilities	26	98.84
H/o Contact with persons suffering from Cutaneous fungal infection	1	10.47

Table 4: Relationship with CD4 count

CD4 COUNT	MALE	FEMALE	TOTAL
0-100	2	1	3
101-200	1	0	1
201-300	2	2	4
301-400	4	5	9
401-500	10	8	18
501-600	2	1	3

Figure 1 : Clinical types of onychomycosis in HIV patients

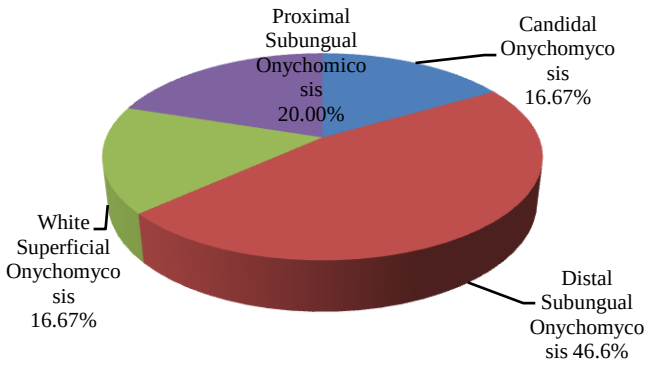

Table 5: Relationship with symptoms and clinical types of onychomycosis

Symptoms	**Clinical Types**				
	Distal Lateral Subungual Onychomycosis	Proximal Subungual Onychomycosis	White superficial Onychomycosis	Candidal Onychomycosis	Total
Asymptomatic	12	8	6	4	30
Pain	6	0	0	2	8
					38

Table 6: Site Involvement of onychomycosis in HIV patients

	Unilateral	**Bilateral**	**Total**	**%**
Finger nails	10	8	18	60.00
Toe nails	4	4	8	26.67
Both	2	2	4	13.33
Total	16(53.33%)	14(46.67%)	30	100.00

Table 7: Relationship between site of involvement and species isolated

Fungus isolated	Finger nails	%	Toe nails	%	Both Finger & Toe nails	%	Total	%
I. Candida sps	3	10.00	1	3.33	1	3.33	5	16.67
C.albicans	3		1		1		5	16.67
II. Dermatophytes	13	43.33	5	16.67	2	6.67	20	66.67
T.rubrum	5		3		2		10	33.33
T.mentagrophytes	8		2		0		10	33.33
III. Non Dermatophytes	2	6.67	2	6.67	1	3.33	5	16.67
Aspergillus spp	1		2		0		3	10.00
Acremonium spp	1		0		0		1	3.33
Geotrichum	0		0		1		1	3.33
Total	18		8		4		30	

Table 8: Relationship between clinical types and species isolated

Species Isolated	Clinical Types				
	Candidal Onychomycosis	Distal Lateral Subungual Onychomycosis	White superficial Onychomycosis	Proximal Superficial onychomycisis	Total
C.albicans	5	0	0	0	5
T.rubrum	0	6	2	2	10
T.mentagrophytes	0	3	3	4	10
Aspergillus spp	0	3	0	0	3
Acremonium spp	0	1	0	0	1
Geotrichum	0	1	0	0	1
Total	5	14	5	6	30

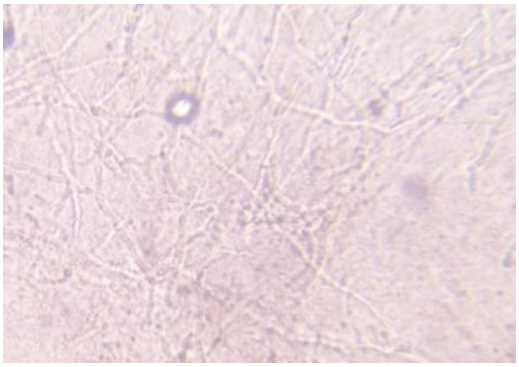

Figure 2: KOH Mount – septate hyphae with branching

Figure 3: Distal lateral subungual onychomycosis

Figure 4: Superficial white onychomycosis

Figure 5: Proximal subungual onychomycosis

Figure 6: Culture on sabourauds dextrose agar- Trichophyton rubrum

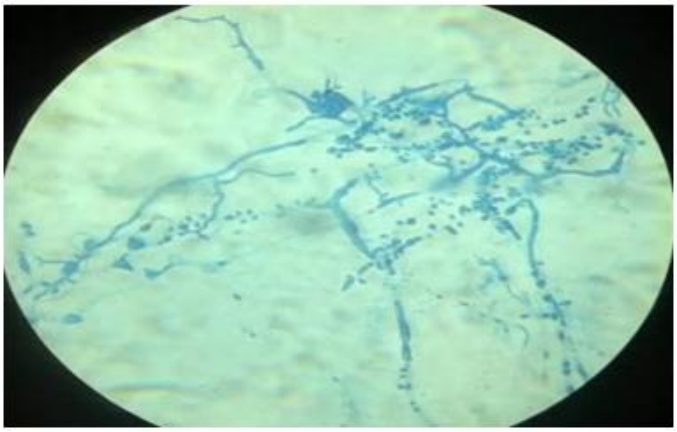

Figure 7: LCB MOUNT- TRICHOPHYTON RUBRUM-Tear shaped microconidia and pencil shaped macro conidida are seen

Figure 8: Culture on SDA agar-Trichophyton mentagrophytes Creamy white colony with cottony mounded surface. No reverse pigment

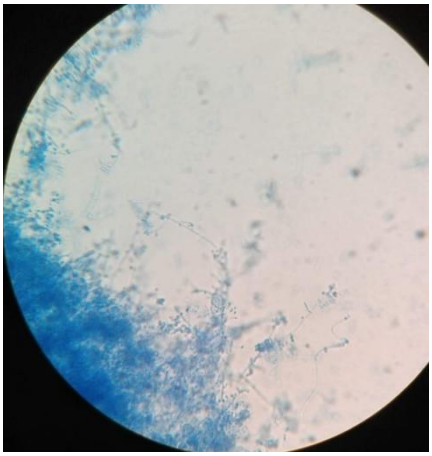

Figure 9: LCB Mount-Trichophyton mentagrophytes clustered round microconidia

Figure 10: SDA AGAR-Trichophyton tonsurans Suede-like center with feathery periphery with white to yellow colour.

Figure 11: LCB Mount - Trichophyton tonsurans -Numerous multiform microconidia are present

Figure 12: SDA Agar-Candida Cream-coloured waxy smooth colonies

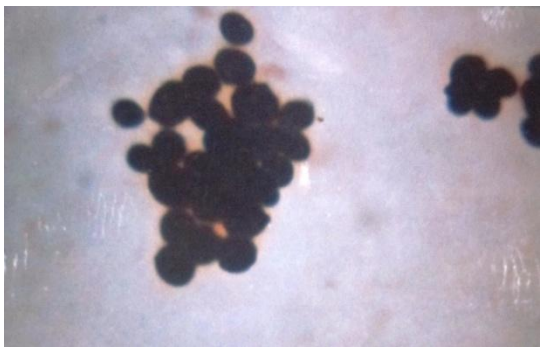

Figure 13: Candida albicans – gram stained - Smear from culture

IV. Discussion

The higher prevalence of onychomycosis among the 21-30 years age group in this study can be attributed to factors such as an increased participation in physical activity, increased exposure to wet work and shoe wearing habit among this age group. Early marriage leading to new household responsibilities is another important factor for the increased prevalence of onychomycosis in the 21-30 years age group among Indians.

Ramesh V. [9] et al (1982) observed a higher prevalence in men (68.9%). In the present study, among HIV patients males were commonly affected than females.

40.12% of the patients had occupations associated with increased physical activity. Trauma inflicted to the nails as a result of hard physical work facilitates easy entry of fungal pathogens.

The duration of the disease varied from 3 months to 12 years. The long duration could be explained by the fact that onychomycosis being asymptomatic in a majority, only a few people seek medical advice early.

Among 30 hiv patients discoloration of nail plate was seen in all 30(100%) patients. Oncholysis, subungual hyperkeratosis, distraction of nail plate and paronychia were observed in 60%, 50%, 40% and 16.67%, respectively.

Among 30 HIV patients, finger nails 18(60%) were more frequently involved than the toe nails 8 (26.67%) in both the sexes, with finger nails of the right hand alone being affected in 40% of the patients. In contrast Amar surjushi et al,[10] (2007) reported toe nail involvement common then finger nail involvement.

Among 30 HIV patients, distal lateral subungual onychomycosis 10 (46.66%) was the predominant clinical type observed. It was more frequently seen in those whose occupation mainly associated with increased physical activity (70%). Proximal subungual onychomycosis 6 (20.00%) was the second commonest type, followed by proximal subungual onychomycosis 5 (16.67%) and candidial onychomycosis 5 (16.67%) respectively. Higher risk of exposure to trauma in this group might be a predisposing factor. A K gupta et al [11] (1999) reported, distal lateral subungual onychomycosis type more common in HIV patients, followed by proximal subungual onychomycosis, white superficial onychomycosis.

Among 30 HIV patients 43.43% of the patients had associated fungal infections like tinea corporis (16.67%) tinea pedis (6.66%) and tinea manuum (13.33%). Amar surjushi et al[10],(2007) reported tinea pedis was most common associated infection followed by T .corporis, T .manuum in HIV patients.

In 30 (78.95%) cases out of the 38 clinically suspected HIV patients of onychomycosis nail samples obtained were positive on direct microscopic examination and culture respectively. 127 (71%) out of the 38 mycologically confirmed cases were positive both on direct microscopy and culture. Among 30 HIV patients commonly isolated fungal species were dermatophytes 66.67%, Trichophyton rubrum was the 33.33% followed by T. mentagrophytes in 33.33% of the patients. Raza aly et al[12], (1996) reported T.rubrum in most common dermatophyte in HIV patients.

V. Conclusion

Onychomycosis can no longer be considered a simple cosmetic nuisance confined to the nails. It is significant and important disease which can generate many physical, psychosocial and occupational problems, considerably imparing patients' quality of life. Onychomycosis in HIV patients shows much variation when compared to non- HIV patients in clinical types and causative organisms. This variation could be due to the immunosupression in HIV infected patients predisposing this population to uncommon infections.

References

[1]. Matis WL, Triana A, Shapiro R,Eldred L, Polk BF, Hood AF. Dermatologicac findings associated with human immunodeficiency virus infection. Jam Acaddermatol 1987; 17:746-51.
[2]. Kaplan MH, Sadick N, Mcnutt NS, Meltzer M, Sarngadharan MG, Pahwa S. Dermatalogic findings and manifestation of acquired immunodeficiency syndrome (AIDS) .J Am Acad Dermatol 1987;16:485-506.
[3]. Goodman DS. Teplitz ED, Wishner A, Klein RS, Burk PG, Hershenbaum E. Prevalence of cutaneous disease in patients with acquired immunodeficiency syndrome or AIDS related complex. J Am Acad Dermatol 1987; 17:210-20.
[4]. Prose NS, Abson KG, Seher RK. Disorders of the nails and hair associated with human immunodeficiency virus infection. Int J Dermatol 1992; 31:453-7.
[5]. Criber B, Mena ML, Rey D, Partisani M,FabienV, Lang JM, et al. nail changes in patients infected with human immunodeficiency virus: A prospective controlled study. Arch dermatol 1998; 134:1216-20.
[6]. Canant MA .The AIDS epidemic. J Am Acad dermatol 1994; 31: 47-50.
[7]. Herranz P, Grracia J,De Lucas R, et al, Toenail onychomycosis in patients with aquried immunedeficency syndrome treatment with terbinafine .Br J Dermatol 1997;137:577-80.
[8]. Rigopoulos D Katisboulas V et al; Epidemiology of onychomycosis in southern Greece .Int Dermatol 1998; 37 (12): 925-928.
[9]. Reddy BSN, Ramesh V, Singh R. Clinico-Mycological study of onychomycosis. Ind J Derm Vener Lepr, 1982; 48: 145 – 150.
[10]. Amar surjushe,a clinic mycological study of onychomycosis in HIV infection. IJDVL ,2007,Vol 73,issue 6,397-401
[11]. Gupta AK, Summerbell RC. Combined distal and lateral subungual and white superfuicial onychomycosis in the toe nails. J Am Acad Dermatol, 1999; 41: 938 – 944.
[12]. Raza Aly, clinical infectious diseases; 1996; 22; s128-32.

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