

Comparison of Dermatophytosis among Psoriasis and Non-Psoriasis Group

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Abstract: The dermatophytes are a group of closely related fungi that have the capacity to invade keratinized tissue (skin, hair, and nails) of humans and other animals to produce an infection¹, Psoriasis is a chronic skin disease caused by rapid growth of skin cells. There are suggestions that dystrophic nails in psoriatic patients lose their natural preventing barrier and therefore are more predisposed to fungal infections². It is therefore important to clarify how frequent mycosis occurs in psoriasis patients³. The study group included 150 clinically suspected cases of Dermatophytosis in psoriatic and non-psoriatic patients attending Osmania general hospital, Hyderabad during March 2015-August 2015. Out of the total 75 Dermatophytosis cases of non-psoriatic group 46(61.33%) were positive for both KOH and culture and Of the 75 psoriatic group 16 (21.3%) were positive for both KOH and culture *Trichophyton tonsurans* was the commonest isolate 28/53 (52.9%). The difference found in the psoriasis vs. the control groups was significant. Hence the present study supports the hypothesis of Reza Yaqoobi⁴ that the Infection involving prevalence of Dermatophytosis in normal population is higher than the patients with psoriasis.

Keywords: Dermatophytosis, clinically suspected, Psoriasis, Non-Psoriatic, *Trichophyton tonsurans*.

INTRODUCTION

The dermatophytes are a group of closely related fungi that have the capacity to invade keratinized tissue (skin, hair, and nails) of humans and other animals to produce an infection[1]. Psoriasis is a chronic skin disease caused by rapid growth of skin cells.

Typical turnover of the skin cells allows them to grow, live, die and slough off on a routine basis. There are suggestions that dystrophic nails in psoriatic patients lose their natural preventing barrier and therefore are more predisposed to fungal infections². It is important to clarify how frequent mycosis occurs in psoriasis patients³. the present study is aimed at isolation and identification of dermatophyte species, comparison of their infection among psoriatic and non-psoriatic patients

MATERIALS AND METHODS

Study population: 150 clinically suspected cases of Dermatophytosis among psoriatic and non-psoriatic

Collection of material

From skin

The affected area was thoroughly swabbed with 70% alcohol to remove surface contaminants. After it has dried the active edge of the lesion was scrapped with a flame sterilized blunt scalpel.

From the scalp

The same procedure was followed as for the skin scrapings in addition a few affected hairs were epilated with sterile epilating forceps

From the nail

The affected nail was meticulously swabbed with 70% alcohol and allowed to dry. Scrapings were obtained by lifting the nail and scrapped with the help of scalpel or with scissors. care was taken to obtain recently invaded nail tissue.

Direct microscopic examination

A small portion of the specimen was directly collected onto a sterile microscopic slide to which a drop of 10% KOH (potassium hydroxide) was added and covered with a cover slip. Specimens were also examined with a mixture of KOH and DMSO (dimethyl sulphoxide)

The preparations were examined under low power and high power objectives of a light microscope.

Culture

All direct positive and negative samples were cultured. Primary cultures were made in sabourauds dextrose agar(SDA)containing chloramphenicol and cycloheximide. After inoculation, the bottles were kept incubated at room temperature and examined at regular intervals for growth. Slopes not showing growth for four weeks were discarded. Any visible growth on the slant was examined for: colony morphology, microscopic morphology, tease mount preparation, slide culture, urea hydrolysis.

RESULTS

The study group included 150 clinically suspected cases of Dermatophytosis in psoriatic and non-psoriatic patients. There were 48 males (63.56%) and 27 (36.44%) among non-psoriatic group and there were 52 males (69.3%) and 23 females (30.67%) among psoriatic group in both the groups males outnumbered the females.

Table-1: Clinical types of Dermatophytosis

Clinical types	Non-psoriatic group				Psoriatic group			
	Cases(n)= 75		Percentage	Cases(n)=75		Percentage		
	M	F		M	F			
Tinea corporis	33	21	12	43.5%	5	4	1	6.67%
Tinea capitis	17	12	5	23.52%	4	1	3	5.33%
Tinea cruris	6	5	1	7.56%	0	0	0	0
Tinea pedis	6	2	4	7.56%	3	2	1	4%
Tinea unguinum	5	4	1	6.67%	46	35	11	60%
Tinea manuum	4	1	3	5.33%	17	11	6	22.7%
Tinea barbae	2	2	0	2.67%	0	0	0	0
Tinea faciei	1	1	2	2.67%	0	0	0	0

The predominant age group in both males and females was 21-30yrs

Results obtained after direct examination and culture



Fig-1: showing hair bulb with spores



Fig-2: SDA slants with growth of *Trichophyton tonsurans*

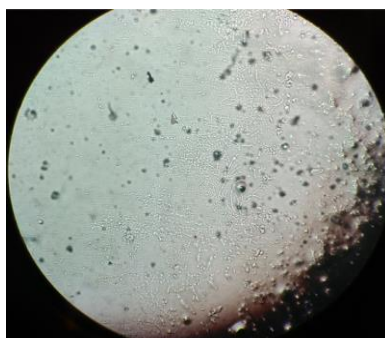


Fig-3: showing fungal branching fungal hyphae

NON-PSORIATIC GROUP

Out of the total 75 Dermatophytosis cases of non-psoriatic group 54 (71.56%) were direct KOH wet

mount examination positive and 21(28.4%) were wet mount negative. 46(61.33%) were positive for both KOH and culture.

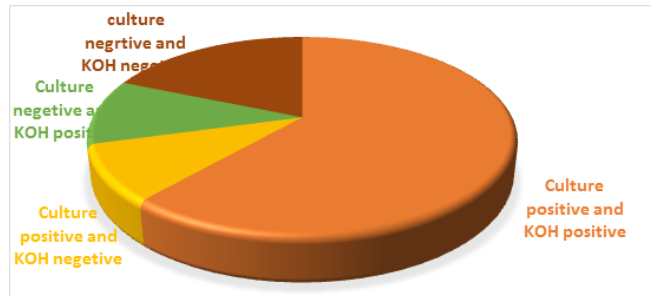


Chart-1: KOH and culture positivity in non-psoriatic group

PSORIATIC GROUP

Of the 75 psoriatic group 42 (56.7%) were direct KOH wet mounting examination positive and 33

(44%) were wet mount negative. 16(21.3%) were positive for both KOH and culture.

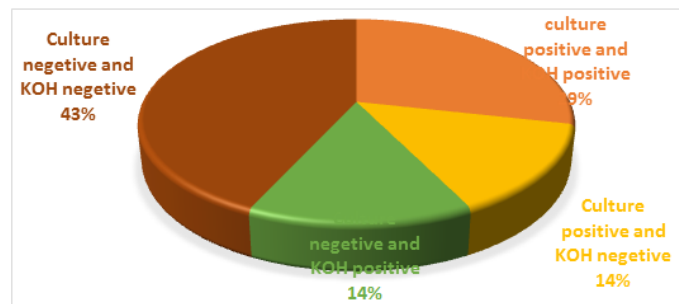


Chart-2: KOH and culture positivity in psoriatic group

Incidence of various species of dermatophytes in clinical isolates

Out of the total 75 cases of Dermatophytosis in non-psoriatic group 53 were positive for culture.

Trichophyton tonsurans was the commonest isolate 28/53 (52.9%).

Table-2: Incidence of various species of dermatophytes in clinical isolate

Species	Non-psoriatic group		Psoriatic group	
	No of isolates	Percentage	No of isolates	Percentage
<i>Trichophyton. Tonsurans</i>	28	52.9%	6	8%
<i>Trichophyton rubrum</i>	11	21.57%	8	10.7%
<i>Trichophyton violaceum</i>	8	14.7%	3	4%
<i>Trichophyton. mentagrophyte</i>	4	6.86%	5	6.7%
<i>Trichophyton. Verrucosum</i>	2	2.94%	2	2.94%

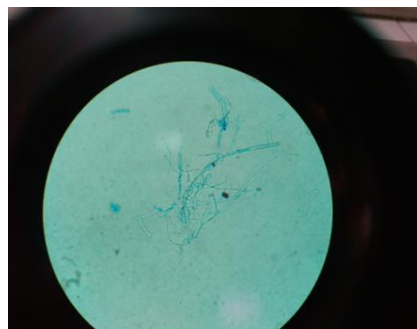


Fig-6: LPCB mount showing *Trichophyton tonsurans*

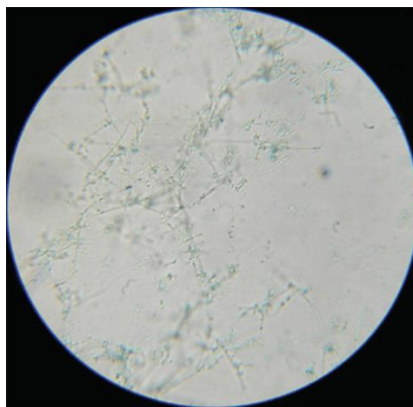


Fig-7: *Trichophyton rubrum*

DISCUSSION

This study shown maximum number of cases in the age group of 21-30 years (32%), followed by 31-40 years (18.22%), (34.6%) among non-psoriatic group and psoriatic group respectively. The present study is in line with Kumar *et al.* [6], Banerjee U *et al.* [7], Amin AG *et al.*[8], Rao *et al.* [9] and in contrast with Suman et al¹⁰ observed more cases in age group of 11-20 years.

The reason for the higher incidence in the second and third decade of life as observed in our study may be due to more chance of exposure to infection due to their occupation and sweating will be more due to heavy work.

In the present study Dermatophytic infection was more common in male than in female. There were 48 males (63.56%) and 27 (36.44%) among non-psoriatic group and 52 males (69.3%) and 23 females (30.67%) among psoriatic group.

KM Achary, RK Thakur *et al.* in 1995 reported dermatophytic infection more in men (65%) and less in female (35%) [11].

Male predominance of Dermatophytosis was observed due to increased Out Door activities and increased opportunity for exposure to the fungi of men than women

Table-3: Comparison of age sex and site of involvement

	Male: Female ratio	Commonest age group affected	Commonest clinical site involved
Aruna Aggarwal [12]	1.8:1	>20yrs (60%)	T.corporis (36.1%)
Grover WCS [13]	4.26:1	20-30yrs (39%)	T.pedis(12.46%)
Parul [14]	1.75:1	21-30 yrs (29.3%)	T.corporis (64%)
Nawal [15]	1.8:1	Adult (66.5%)	T.corporis (40.8%),
V Bindu [16]	2.06:1	11-20 yrs (23.3%)	T.corporis (54.6%)
Present study	1.7:1	21-30 yrs(32%)	T.corporis (43.5%)

Comparison of Dermatophytosis

Of the 75 cases of non-psoriatic group 61.3% of the specimens were positive for Dermatophytosis and among psoriatic group only 32% had Dermatophyte infection. Among the 32% cases most of them had onychomycosis. The difference found in the psoriasis vs. the control groups was significant. Hence the present study supports the hypothesis of Reza Yaqoobi [4] that the prevalence of Dermatophytosis in normal population is higher than the patients with psoriasis.

Gupta *et al.* [3] and Kacar *et al.* [17] concluded that nail psoriasis constituted a risk factor for onychomycosis specifically by dermatophytes.

Other case control studies by Larsen *et al.* [18], Staberg *et al.* [19], and Stander *et al.* [11], reported a higher probability of yeast infection, while Szepes [20] reported a higher probability of non-

dermatophytic infection in psoriatic nails, but they all also concluded that the frequency of onychomycosis in psoriatic patients did not differ from the occurrence of onychomycosis in non-psoriatic.

Pawlaczyk *et al.* [21], and Gotz *et al.* [22], reported that there was no altered susceptibility to onychomycosis in patients with psoriatic nail changes.and Zaias *et al.* [23], reported non-dermatophytes and some yeasts.

The difference in the present study and the other studies might be because they have included only onychomycosis or tinea pedis as the study group, but the present study includes all types of tinea infections. And most of the studies had non dermatophytic fungi as the common isolates.

It is important to remember that oral terbinafine may induce de novo development of psoriatic lesions or exacerbate pre-existing psoriasis [24,25]. Therefore, this highly effective antifungal

agent [26] should rather be avoided in psoriatic individuals.

STATISTICS

Table-4: chi square test of culture positivity

P/NP	CULTURE POSITIVE	CULTURE NEGATIVE	TOTAL
PSORIATIC	24	51	75
NON-PSORIATIC	53	22	75
TOTAL	77	73	150

$X^2=22.4426$ $P<0.0001$ $OR=0.19(0.09-0.39)$

Table-5: chi square test of KOH positivity

P/NP	KOH POSITIVE	KOH NEGATIVE	TOTAL
PSORIATIC	24	51	75
NON-PSORIATIC	54	21	75
TOTAL	78	72	150

$X^2=24.03$ $P<0.0001$ $OR=0.18(0.09-0.39)$

The differences found in the psoriasis vs. the control groups are statistically significant. This study does supports the hypothesis that the prevalence of Dermatophytosis in patients with psoriasis differs from that in a normal population.

CONCLUSION

The differences found in the psoriasis vs. the control groups were significant. This study does support the hypothesis that the prevalence of Dermatophytosis in patients with psoriasis differs from that in a normal population. But, we should remain aware of the fungal manifestations in psoriatic patients, which would not appear to be an exceptional occurrence

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