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COEXISTENCE OF ONYCHOMYCOSIS IN PSORIATIC NAIL

Dermatology

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ABSTRACT

Background: Psoriasis is a chronic inflammatory autoimmune disease that manifests with red patches of skin covered with thick, silvery scales and has a prevalence of 2-3% in the population. Nail involvement in psoriasis is often complicated by concomitant fungal infections. **Objective:** The aim of this study was to investigate the prevalence of fungal infections in nail psoriasis and correlate it with the severity of nail psoriasis. **Methods:** 50 patients with nail psoriasis were included in the study. Direct microscopic examination with 20% KOH and culture were carried out in all patients showing psoriatic nail changes. Histopathological examination with Periodic Acid-Schiff (PAS) stain was done in cases negative by KOH examination and culture. **Result:** Most frequently occurring type of psoriasis was Chronic Plaque Psoriasis and least common type was Pustular Psoriasis and Psoriatic Arthritis. Total 15 (30%) patients had positive KOH and Culture and PAS results of nail psoriasis sample. Fungal culture grew dermatophyte (2/50, 4%), non-dermatophytes(yeast 8/50,16%) (molds 4/50,8%). The most common finger nail change observed was pitting (54.3%) and most common toenail changes observed were subungual hyperkeratosis (38.3%). There was no significant association of NAPSI score between the psoriasis patients with and without onychomycosis 38.88 vs 22.3 ($p > 0.05$). **Conclusion:** Co-existance of Onychomycosis in Psoriatic patient does occur.

KEYWORDS

Psoriasis, onychomycosis, culture

INTRODUCTION

Psoriasis is a chronic inflammatory autoimmune disease that manifests with red patches of skin covered with thick, silvery scales and has a prevalence of 2-3% in the population[1]. A fungal infection of the toes or fingers known as onychomycosis can damage the matrix, bed or plate of the nail as well as other parts of the nail unit. Onychomycosis can cause pain, discomfort and deformity, as well as severe physical and vocational limits and a decrease in quality of life[2].It is a fungal infection that causes nail thickening, discoloration and separation from the nail bed. In the general population 10% of people have onychomycosis, but this number rises to 20% in people over the age of 60 and 50% in those over the age of 70[3]. Considering that onychomycosis can aggravate nail abnormalities in psoriasis by koebnerization , it may be useful to differentiate between psoriatic nail alterations and an underlying onychomycosis in psoriatic patients. With this background, the present study was carried out to study the presence of investigative evidence of onychomycosis in psoriatic nail.

MATERIALS AND METHOD

50 patients with psoriasis having NAPSI > 0 were included in the study over a period of 18 months (2020–2022). Those patients who were on systemic antifungal treatment for any indication and/or on topical antifungal treatment for onychomycosis within the period of last 4 weeks were excluded from the study. After obtaining informed consent, detailed history was obtained in all cases and detailed clinical examination of the nails was done. Severity of nail disease was scored by Nail Psoriasis Area Severity Index (NAPSI). The severity of skin disease was scored according to the Psoriasis Area Severity Index (PASI).

Only those patients with any psoriatic nail change were evaluated further for onychomycosis. A maximum of two finger nails and two toenails with the suspicion of onychomycosis were selected for evaluation. Samples were collected with a sterile nail clipper after disinfecting the nail with 70% alcohol. The nail samples collected were transported in a sterile pouch made out of paper to microbiology lab and in 10% formalin solution to pathology lab. All specimens were subjected to direct microscopy in 20% KOH to determine the presence of fungal elements. The specimens were cultured in two tubes containing Sabouraud's Dextrose Agar (SDA), with and without cycloheximide, respectively. The culture tubes were incubated at 25°C and examined daily for 4 weeks. Histopathology of nail specimen was necessary when KOH and culture are repeatedly negative in patients with suspected onychomycosis. Histological examination of the affected nail material was carried out by Periodic Acid-Schiff (PAS) staining.

Diagnosis of onychomycosis was made if both direct microscopy with 20% KOH and culture were positive, or histological examination with PAS demonstrated fungal elements in cases negative by direct microscopy and culture

Stastical Analysis

The data was entered into the Microsoft excel and the statistical analysis was performed by statistical software SPSS version 25.0. The Quantitative (Numerical variables) were present in the form of mean and SD and the Qualitative (Categorical variables) were present in the form of frequency and percentage. The student t-test was used for comparing the mean values between the 2 groups whereas chi-square test was applied for comparing the frequency. The p-value was considered to be significant when less than 0.05

RESULT

Maximum number of patients were in the age group of 39 – 48 years (34%) and minimum number of patients were in the age group of 49 - 58 years (12%). Most of the patients were 70% males and remaining 30% were females . Maximum female patients were housewife (22%) followed by farmers (16%), student (14%),unemployed (12%), teacher (8%), labourer and shopkeeper (6% each) while least frequency was that of mineworker (2%) with maximum number of patients of Psoriasis had duration of <1 years (44%) shown in **Table 1**. Most frequently occurring type of psoriasis was Chronic Plaque Psoriasis (76%) followed by guttate psoriasis (16%), palmoplantar psoriasis(2%) and least common type was Pustular Psoriasis and Psoriatic Arthritis (1% each) as shown in **Table 2**. Total 15 (30%) patients had positive KOH **(Image1)** and Culture and PAS results of nail psoriasis sample **(Table 3).** Fungal culture grew dermatophyte (2/50,4%), non-dermatophytes (yeast 8/50,16%) (molds 4/50,8%). The most common finger nail change observed was pitting (54.3%) followed by onycholysis (50%), subungual hyperkeratosis (34%) , salmon patch (10%) and most common toenail changes observed were subungual hyperkeratosis (38.3%) followed by onycholysis (30%) and leukonychia(4%).The mean PASI score of 50 patients was 6.35. The mean of total NAPSI score (finger and toenails) of patients with nail changes was 31.5. Mean NAPSI scores for fingernails and toenails

were 19.8 and 11.2 respectively. There was no significant association of NAPSI score between the psoriasis patients with and without onychomycosis 38.88 vs 22.3 (p >0.05).

Table 1: Frequency distribution of duration of Psoriasis

Duration	Frequency	Percentage
<1 year	22	44
1 – 5 years	18	36
6 – 10 years	4	8
>10 years	6	12
Total	50	100

Table 2: Frequency distribution of type of Psoriasis

Type of Psoriasis	Frequency	Percentage
Chronic Plaque Psoriasis	38	76
Guttate Psoriasis	8	16
Pustular Psoriasis	1	2
Psoriatic Arthritis	1	2
Palmoplantar Psoriasis	2	4

Table 3 : Onychomycosis in patients of nail psoriasis

Diagnostic test for onychomycosis	Fingernail	Toenail
KOH and Culture test Positive	8	6
PAS Positive	0	1
Total	8	7

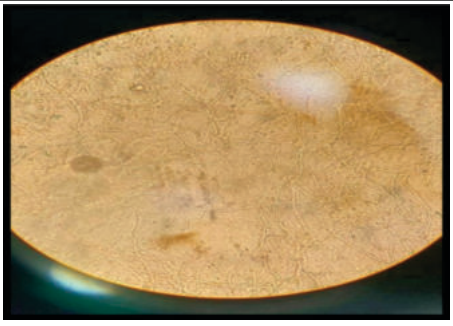

Image 1: Nail clipping on KOH mount (400X) showing branching fungal hyphae .

Image 2: Culture showing aspergillus species

Image 3: Culture showing growth of Candida albicans

DISCUSSION

The association of onychomycosis and nail psoriasis remains unclear and sometimes contradictory, as observed from studies done by Gupta et al[4], Larsen et al[5] and Natarajan et al[6]. Most frequently occurring type of psoriasis was chronic plaque psoriasis and least common type was both pustular psoriasis and psoriatic arthritis (2%). These findings were consistent with the study done by Satish Kumar P et al[7]. 70% of total patients were males and 30% were females. Males were more likely to be affected than females. The clinical differentiation of psoriatic nails with onychomycosis can be challenging sometimes. Kacar et al[8] found that nail changes were more severe in patients with onychomycosis, suggesting that the presence of fungal infection may intensify nail psoriasis through koebner effect. There were no correlations between the presence of fungal infection and the type of nail alterations.

The NAPSI score was slightly higher in patients with onychomycosis (16.2) compared to patients without onychomycosis (14.7) p > 0.05 according to study done by Jandoubi et al[9].In our study NAPSI score was also higher, 38.88 for patient with onychomycosis and 22.3 for patient without onychomycosis but the difference was not statistically significant.

The coexistence of psoriasis and onychomycosis has been reported in the literature. According to Solomon J. et al. [10] and Natarajan et al. [6], there is a roughly 18% correlation between psoriasis and ony chomycosis, which is comparable to our study.

In our study Onychomycosis was detected in 15 (30%) patients with nail psoriasis. The findings were compared to those of a study by Klaassen et al[11], which found that although there is still a lack of conclusive evidence, the average prevalence of onychomycosis in psoriatic patients is 18.0%, which appears to be higher when compared to control groups and the literature on healthy populations.

Gupta et al[4], and Kacar et al[8] concluded that nail psoriasis constituted a risk factor for onychomycosis specifically by dermatophytes. In our study, Fungal culture grew dermatophyte (4%), Non dermatophytes (16% yeast & 8% molds).

CONCLUSION

A high rate of concomitant fungal infection, especially yeasts and non-dermatophytes , was found in patients with psoriatic nails.

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