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Original Article

Prevalence, clinical profile, and severity of nail involvement in psoriasis – A hospital-based cross-sectional study from a tertiary care center in North Kerala

Vivek Prabhakar, Bifi Joy, Anoop Thyvalappil, Rajiv Sridharan, Ajayakumar Sreenivasan, Pretty Mathew

Department of Dermatology, Goverment Medical College, Kannur, Kerala, India.

***Corresponding author:**
Dr. Anoop Thyvalappil, Professor, Department of Dermatology, Goverment Medical College, Kannur, Kerala - 670503, India.

anooptvanoop@gmail.com

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ABSTRACT

Objectives: Nail changes are present in 25–50% of psoriatic cases. Nail Psoriasis Severity Index (NAPSI) assess the extent of the involvement of the psoriatic nail unit. This study was conducted with the aim of finding the prevalence, clinical characteristics and severity of nail psoriasis.

Methods and Materials: In this cross-sectional study, a thorough clinical examination was done to determine the type and extent of skin disease including PASI (psoriasis area severity index) score, and all the fingernails and toenails were examined in a well-lit environment, under a magnifying lens to visualize the nail findings, and NAPSI score was calculated for each patient. Statistical Package for the Social Sciences (SPSS v. 11.0) software was used to analyze the data collected.

Results: Of the100 patients studied, 73% of patients with psoriasis had nail involvement. Mean total NAPSI was 30.97 ± 30.79. Mean age of onset of psoriasis was 43.62 ± 15.31 and 33.04 ± 12.80 in those with and without nail involvement respectively (*P*-value 0.002). The majority without nail involvement (77.8%) belonged to the early-onset group, while 22.2% of those without nail involvement had late-onset psoriasis (*P*-value 0.001). The most common nail pattern in our study was Pitting (93.2%).

Limitation: Nail changes in severe forms of disease could not be studied since patients receiving systemic drugs for the disease were excluded from the study.

Conclusion: The mean duration of psoriasis in those with nail involvement in our study was 5 years more than in those without nail disease. Our study demonstrated a significant association between higher PASI scores and nail involvement. All patients with severe psoriasis (PASI >20) in our study had nail involvement.

Keywords: Psoriasis, Psoriasis area severity index, Nail psoriasis severity index

INTRODUCTION

Nail involvement is seen in association with all types of psoriasis of the skin and is frequently present with psoriatic arthropathy. Nail changes are present in 25%–50% of all cases. There is no sex predilection, but patients over 40 years of age are affected twice as often as those under 20 years.[1]

Of reducing frequency, nail signs of psoriasis include pits, onycholysis, subungual hyperkeratosis, nail plate discoloration, uneven nail surface, splinter hemorrhages, acute and chronic paronychia,

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and transverse midline depressions in the thumbnails. Pits, ridges, and grooves are a result of psoriasis of the nail matrix, whereas onycholysis, subungual hyperkeratosis, and splinter hemorrhages are attributable to disease of the nail bed or hyponychium.[1]

Nail Psoriasis Severity Index (NAPSI), which assesses the extent of the involvement of the psoriatic nail unit, has been developed by Rich and Scher, which is useful in clinical trials and in evaluating different treatment modalities for psoriatic nails.[2] This study was conducted with the aim of finding the prevalence, clinical characteristics, and severity of nail psoriasis among patients attending a tertiary care hospital in North Kerala.

METHODS

All the psoriasis patients attending the outpatient department of dermatology and venereology at a tertiary referral center in North Kerala for a period of 1 year were included in this cross-sectional study.

Exclusion criteria

Patients receiving/have received systemic antipsoriatic medications or topical nail medications in the past 3 months and patients with concomitant onychomycosis proven by microscopy and/or culture were excluded from the study.

A detailed history was taken in each patient with particular reference to cutaneous complaints including duration, progression, and treatment modalities. Based on the age of onset of disease, patients were classified into early-onset group (age of disease onset <40 years) and late-onset group (age of disease onset at or after 40 years).[2] A thorough clinical examination was done and extent of skin disease was documented using Psoriasis Area Severity Index (PASI) score. Based on PASI score, patients were classified into mild (PASI <10), moderate (PASI 10–20), and severe disease (PASI >20). All the fingernails and toenails were examined in a well-lit environment, under a magnifying lens to visualize the nail findings, and NAPSI score was calculated for each patient.

NAPSI scoring[3]

In this scoring system, each quadrant of the nail is evaluated for the presence or absence of nail matrix disease (pitting, leukonychia, red spots in lunula, and nail plate crumbling) and for nail bed disease (oil drop [salmon patch] discoloration, onycholysis, nail bed hyperkeratosis, and splinter hemorrhage).

Each nail gets a matrix score and a nail bed score, the total of which is the score for that nail (0–8). The sum of the individual nail scores is the total NAPSI score of the patient. The sum of the scores for all of the finger and toenails varies from 0 to 160 and is the nail psoriasis severity score for that patient at that time.

Relevant investigations including KOH mount and fungal culture and skin biopsy were carried out wherever required, to confirm the diagnosis. The Statistical Package for the Social Sciences (SPSS v. 11.0) software was used to analyze the data collected in this study. Mean and standard deviations were compared between patients with and without nail psoriasis using *t*-test for independent samples. Categorical variables were summarized as number and percentages of all patients and evaluated using Pearson's Chi-square test.

RESULTS

A total of 100 patients were enrolled into the study: 71 were male and 29 were female. Fifty had early-onset psoriasis and the other 50 had late-onset disease. 43/71 (60.6%) of males had late-onset psoriasis, while 28 (39.4%) had early-onset disease; 22/29 (75.9%) of females suffered from early-onset psoriasis and the remaining 7 (24.1%) had late-onset disease.

Mean age of the patients was 46.32 ± 15.68. Mean duration of psoriasis was 5.67 ± 8.73 years. Mean age of the onset of psoriasis was 40.76 ± 15.36.

73/100 (73%) patients with psoriasis had nail involvement. 60/71 (84.5%) of males and 13/29 (44.8%) of females had nail involvement.

The majority of patients with nail involvement (42.5%) were in the 40–59 years age group. None of the <20 years age group had nail involvement. Most of those without nail involvement (17/27, 63%) fell in the 20–39 years category. The findings were statistically significant ($P = 0.000$).

Mean age of onset in psoriatics with nail involvement was 43.62 ± 15.31, while in those without nail involvement, this was 33.04 ± 12.80 ($P = 0.002$). Most of the patients with nail involvement (44/73, 60.3%) had late-onset psoriasis, while 39.7% (29/73) had early-onset psoriasis. The majority without nail involvement (21/27, 77.8%) belonged to the early-onset group, while 22.2% (6/27) of those without nail involvement had late-onset psoriasis ($P = 0.001$) as shown in Figure 1.

Mean duration of psoriasis in those with and without nail involvement was 7.07 ± 9.67 years and 1.90 ± 3.28 years, respectively ($P = 0.008$).

The mean PASI of the study group was 7.07 ± 6.28 which ranged from 0 to 33.7. Mean PASI in psoriasis patients with nail involvement was 8.19 ± 6.64 and without nail involvement was 4.05 ± 3.84 ($P = 0.003$).

Mean total NAPSI was 30.97 ± 30.79. Mean total NAPSI in males was 39.14 ± 31.54 and in females was 10.97 ± 16.74.

The mean total NAPSI score in those with early-onset psoriasis was 38.5 ± 32.0 and in late-onset psoriasis was 45 ± 25.9 ($P = 0.340$). Mean total NAPSI was highest in those with psoriasis of 5–10 years duration (60 ± 28.7, $P = 0.01$), followed by psoriasis > 10 years (46.7 ± 32.7), <1 year duration (35.1 ± 23.1), and 1–5 years duration (33.2 ± 25.5).

Among patients with nail involvement as well as those without nail involvement, the patients with mild psoriasis (PASI <10) accounted for the majority (52/73 [71.2%] and 24/27 [88.9%], respectively). Patients with moderate psoriasis accounted for 20.5% (15/73) of those with nail involvement and 11.1% (3/27) of those without nail involvement. Those with severe psoriasis (PASI >20) accounted for 8.2% (6/73) of patients with nail involvement and none of the severe psoriasis patients figured in the "nails not involved" category ($P = 0.135$).

Mean NAPSI score in mild psoriasis patients (PASI <10) was 40.8 ± 26.6, in moderate psoriasis (PASI 10–20) was 42 ± 33.3, and that in severe psoriasis was 57.5 ± 32.6 (P = 0.401), as shown in Figure 2. Frequency of specific psoriasis nail patterns in fingernails and toenails is depicted in Table 1.

The most common finding among those with nail changes was pitting (68/73, 93.2%). Other common changes were onycholysis (55/73, 75.3%), subungual hyperkeratosis (52/73, 71.2%), crumbling (51/73, 69.9%), leukonychia (40/73, 54.8%), and oil drop sign (37/73, 50.7%).

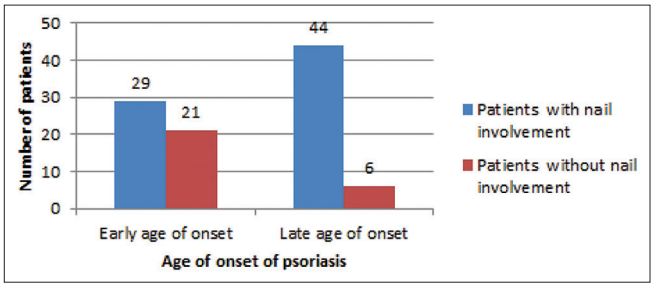

Figure 1: Association between nail involvement and age of the onset of psoriasis.

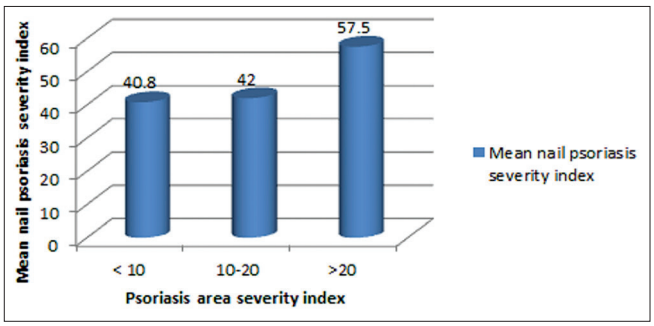

Figure 2: Comparison between mean Nail Psoriasis Severity Index and Psoriasis Area Severity Index.

DISCUSSION

Of the 100 patients enrolled in this study, 71 were male and 29 were female. Nail involvement is common in psoriasis and, according to Samman and Fenton, over a lifetime, the incidence is probably nearer 80%–90%.[4] Studies by Brazzelli *et al.* and Tham *et al.* seem to indicate that this figure can vary widely, with some studies showing prevalence above 75%.[5,6] Our study too showed a prevalence of 73%, which is in line with the more recent studies. About 2% had only nail findings, without any skin changes of psoriasis. This is in line with the current literature that puts the prevalence of nail psoriasis as the exclusive manifestation of psoriasis between 1% and 10%.[7,8] While an overwhelming, majority (84.5%) of males had nail involvement, less than half (44.8%) of females with psoriasis had nail involvement. The studies by Kaur *et al.*, Augustin *et al.*, and Yap and Pubalan and Armesto *et al.* also showed higher prevalence of nail changes in males.[9-12] However, the study by Tham *et al.* did not show any difference in prevalence according to gender.[6]

The mean age of the patients, mean duration of the disease, and the mean age of the onset of disease documented by us was comparable to the finding of Brazzelli *et al.*[5]

Gudjonsson *et al.* had suggested that all types of nail changes were more common in the HLA-C*0602 negative (more often associated with late-onset psoriasis) patients, and they more often had multiple types of nail lesions. Our findings were also supportive of this observation.[13] Whether the early age of onset was the reason for most of the females in this study presenting without nail changes due to psoriasis compared to males, most of whom had late-onset disease and psoriatic nail changes need evaluation in larger studies. The Brazzelli *et al.* study also revealed a higher age of onset in those with nail disease, but the difference was not significant.[5] In contrast, the study by Armesto *et al.* observed a lower age of onset in psoriasis patients with nail involvement compared to those without nail findings.[12]

The study by Brazzelli *et al.* had the majority of nail involved patients in the 40–59 years category, which was consistent with our finding but unlike documented by us the majority of their patients without nail involvement fell in the ≥60 years age group.[5] Yap and Pubalan found the psoriasis patients with nail disease to be significantly older than the ones without nail disease.[11]

The mean duration of psoriasis in those with nail involvement in our study was about 5 years more than in psoriatics without nail disease. Tham *et al.* found that nail changes were significantly more common in patients who have psoriasis for >5 years as compared with patients who have psoriasis of <5 years duration.[6] Recently, the study by Augustin *et al.* also showed correlation between

Table 1: Distribution of specific psoriasis nail patterns in fingernails and toenails among patients with nail changes of psoriasis.

Nail changes seen in psoriatic patients with nail involvement	Patients with involvement of fingernails alone (%)	Patients with involvement of toenails alone (%)	Patients with involvement of both fingernails and toenails (%)	Total patients with nail involvement due to psoriasis manifesting the specified change (%)
Pits	11 (15.1)	3 (4.1)	54 (74)	68 (93.2)
Leukonychia	8 (11)	21 (28.8)	11 (15.1)	40 (54.8)
Red spots in lunula	4 (5.5)	5 (6.8)	0 (0)	9 (12.3)
Crumbling of nail plate	1 (1.4)	30 (41.1)	20 (27.4)	51 (69.9)
Onycholysis	14 (19.2)	18 (24.7)	23 (31.5)	55 (75.3)
Oil drop sign	12 (16.4)	8 (11)	17 (23.3)	37 (50.7)
Splinter hemorrhage	15 (20.5)	6 (8.2)	2 (2.8)	23 (31.5)
Subungual hyperkeratosis	10 (13.7)	11 (15.1)	31 (42.5)	52 (71.2)
Beau's lines	5 (6.8)	8 (11)	0 (0)	13 (17.8)
Rough nails	3 (4.1)	23 (31.5)	5 (6.8)	31 (42.5)

Percentage given in bracket is the percentage of 73 patients with psoriatic nail changes manifesting the specific finding

nail psoriasis and longer duration of disease.[10] Our observation of pitting and onycholysis as the most common nail findings in psoriatics was consistent with the previous studies.[6,9,14,15]

The current study demonstrated a significantly higher mean PASI among psoriasis patients with nail involvement than in those without. This was concurrent with results from the previous studies which revealed a more severe disease in psoriatics with nail involvement.[6,10,11,12]

Mild psoriasis (PASI <10) observed in majority of our study subjects, irrespective of presence or absence of nail involvement (71.2% and 88.9%, respectively) could be attributed to the selection bias, leading to exclusion of those with severe disease since patients on systemic drugs for psoriasis were excluded. The large sample size in the Augustin *et al*. study, with many patients falling into the severe psoriasis category, had enabled them to showcase the association between nail changes and severity of psoriasis.[10]

Higher mean total NAPSI score in those with early age of disease onset in comparison to those with late-onset psoriasis, though not significant, shows a trend toward more severe nail involvement in those with late-onset psoriasis. A similar finding was reported by Brazzelli *et al*.[5]

Although not directly proportional, the NAPSI scores indicated a generally higher trend in those with longer duration of the disease. Our observations of statistically insignificant relation between severity of nail involvement and higher PASI scores were as reported earlier. The study by Sánchez-Regaña *et al*. showed a significant correlation between the psoriasis severity and the NAPSI scores. They also found a fall in PASI and NAPSI scores following treatment, though NAPSI scores fell at a slower rate.[16]

Limitations

By excluding patients receiving systemic drugs for the disease, we were unable to study the nail changes associated with severe psoriasis.

CONCLUSIONS

The frequency of nail changes in psoriasis was 73%. Majority of males and less than half of females with psoriasis had nail involvement. The present study demonstrated a highly significant association between the late-onset group of psoriasis patients and nail involvement. The most common nail pattern in our study was pitting, followed by onycholysis, subungual hyperkeratosis, crumbling, and leukonychia. A significant association between higher PASI scores and nail involvement was observed. A trend toward a more severe nail involvement was noted with increase in severity of psoriasis.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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