

Clinico-Epidemiological Characteristics and Impact on Quality of Life in Psoriatic Patients with and without Nail Changes - A Nepalese Experience

Shikha Khare¹, Sudha Agrawal²

¹Department of Dermatology and Venereology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India. ²Department of Dermatology and Venereology, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

ABSTRACT

BACKGROUND

Nail involvement in psoriasis is likely to influence the quality of life (QOL) because of its highly visible site; however, the impact of this disease on QOL is an underexplored area. Similarly, the relationship between severity of skin involvement and nail involvement has been overlooked. The study was conducted to evaluate the clinico-epidemiological characteristics of psoriasis patients with and without nail changes and assess the health-related quality of life (HRQOL). Furthermore, the correlation of severity of nail involvement with the severity of skin involvement and its impact on quality of life was assessed.

METHODS

A total of 370 adult psoriasis patients with or without nail changes was studied. Skin severity was assessed by body surface area (BSA) and Psoriasis Area and Severity Index (PASI) while nail severity was assessed using Nail Psoriasis Severity Index (NAPSI). Patients' quality of life was measured using the Nepali Version of Dermatology Life Quality Index (DLQI).

RESULTS

Nail psoriasis was more prevalent in males in both the groups; females were having more nail involvement (0.041). There were no significant differences in other clinico-epidemiologic characteristics between these two groups except the late onset of psoriasis in the age group > 30 years, scalp involvement and absence of family history of psoriasis ($P \leq 0.05$). There was a strong positive correlation between the age of onset of skin changes with age of onset of nail involvement ($r = 0.799$) and the joint involvement ($r = 0.742$) as well as the age of onset of joint involvement with nail changes ($r = 0.838$). The mean PASI was 7.265 ± 7.153 vs. 6.189 ± 7.153 in patients with > 10 vs. ≤ 10 total NAPSI score and it was statistically significant ($P = 0.011$), however, there was a moderate positive correlation between PASI and NAPSI ($r = 0.32$). Almost half of psoriasis patients had very large to extremely large effects on quality of life but leisure and treatment domain were affected more amongst patients with nail changes. Early onset of joint involvement, body surface area of > 3 % involvement and PASI score > 5 had significant effect on quality of life.

CONCLUSIONS

The nail involvement is an important finding in determining the severity of skin involvement and had very large to extremely large effect on quality of life particular on leisure and treatment domain. Therefore, nail examination must be done in all psoriatic patients.

KEYWORDS

Nail Psoriasis, Quality of Life, Dermatology Life Quality Index, Psoriasis Area and Severity Index, Nail Psoriasis Severity Index

Corresponding Author:

Dr. Shikha Khare,
A-19, Single Storey, Malka Ganj,
Behind Malka Ganj Post-Office,
Delhi-110007, New Delhi, India.
E-mail: drshikhakhare@gmail.com

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BACKGROUND

Psoriasis is a common chronic dermatological disease affecting 0.1 % to 11 % population frequently involving skin; however, joints and nails may be involved, and even in patients without skin changes.¹⁻⁴ nail involvement is very common. Psoriasis is affecting 10 - 81.8 % of patients with an estimated lifetime incidence of 80 - 90 % while 5 - 10 % manifest with nail changes alone.⁵⁻¹⁴ The clinical presentation of nail psoriasis is heterogenous including signs of nail bed involvement such as oil-drop discoloration, onycholysis, splinter haemorrhages and subungual hyperkeratosis, and nail matrix involvement as pitting, nail plate crumbling, leukonychia and red spots in lunula.¹⁵

In addition, other features such as Beau's lines, onychomadesis and longitudinal ridging are reported in the studies. Nail fold involvement may manifest as acropustulosis and paronychia. These manifestations depend upon the localization of inflammation in the nail unit. Despite high prevalence, specific impact of nail psoriasis on patient's functioning and well-being has not gained sufficient attention. Patients with nail psoriasis can also experience alterations in quality of life regarding poor cosmetic appearance, pain, restriction in activity of daily living and reduced professional capacity⁶. Clinicians tends to focus on clearing cutaneous component, and nails are often overlooked and are frequently a longstanding problem.⁶

Only a little epidemiological data characterizing patients with nail involvement is available and such study has not been done in Nepalese population to the best of our literature search. Therefore, this study was done to know clinico-epidemiological characteristics of psoriasis patients with and without nail changes and to assess the health-related quality of life using Nepali Version of Dermatology Life Quality Index (DLQI). Furthermore, the correlation of impact of quality of life on nail psoriasis was assessed with the severity of nail involvement using Nail Psoriasis Severity Index (NAPSI) and extent of skin involvement in those patients using body surface area (BSA) and Psoriasis Area and Severity Index (PASI).

METHODS

In this cross-sectional comparative study, patients aged ≥ 18 years with the clinical diagnosis of psoriasis were recruited consecutively from the Department of Dermatology at a tertiary care centre of Eastern Nepal after getting the approval from the institutional ethical review board. Patients with nail changes related to trauma, onychomycosis, receiving treatment within one month or refusal to give consent were excluded.

The prevalence of nail involvement in psoriasis patient was assessed with findings reported by Armesto et al.¹⁶ as 40 % nail involvement within 5 units of true value in both direction and 95 % confidence interval, a total of 369 patients were required, however 370 patients were enrolled in our study. The study duration was between 16 April 2015 to 15 April 2016.

The detailed history of patients with respect to socio-

demographic and psoriasis-related data was taken and thorough cutaneous and systemic examination was done and documented in a pre-set proforma.

The severity of skin involvement was assessed by PASI and BSA.¹⁷ PASI score ranged from 0 - 72. The BSA was calculated as per "The national foundation definition of psoriasis severity" as mild: < 3 %, moderate: 3 - 10 %, and severe: > 10 %.

All twenty nails of patients were evaluated. Nail involvement and severity was assessed by NAPSI.¹⁵ Nail was divided in 4 quadrants and presence of 4 nail bed signs (oil spots, splinter haemorrhage, onycholysis and subungual hyperkeratosis) and 4 nail matrix signs (pitting, crumbling, leukonychia and red spots in lunula) were noted. Presence of each sign in each quadrant was given 1 score. Thus, score ranged from 0 - 8 for each nail, 0 - 80 for all finger nails, and toe nails separately and together for finger and toe nail 0 - 160 score.

Patient's quality of life was measured using the Nepali version of DLQI approved by the original group of Finlay et al.¹⁸ The instrument contains 10 items, dealing with skin and scores ranges from 0 - 30. In our study we modified the "skin" to "skin and, or nail involvement".

The Statistical Package for Social Sciences (SPSS 11.5, SPSS Inc., Chicago, IL, U.S.A.) was used for the statistical analysis. Descriptive statistics were used as mean (SD) and median (range) for numeric data and absolute and percentile frequencies for categorical data. Comparisons of numeric variables was analysed with unpaired t tests or Mann-Whitney U test and the χ^2 test or Fischer's exact test were used for differences between categorical variables. Spearman's rank test was used to know the relationship between continuous variables. Logistic regression was fitted using nail psoriasis as the outcome variable and the different demographic and clinical characteristics measured as the covariate variables. All tests were two-sided. Statistical significance was considered at $p < 0.05$.

RESULTS

Out of the total 370 psoriasis patients, 328 (88.6 %) had nail changes present at the time of the nail examination. The duration of nail involvement ranged from 2 weeks - 20 years with a mean of 2.24 ± 4.46 years. The age of onset of nail involvement ranged from 17 - 85 years with a mean of 42.33 ± 13.05 years. History of relapse / recurrences was present in 252 (68.1 %) patients, majority had ≤ 10 relapses (196; 77.8 %). History of precipitating factors was present in 56 (15.1 %) patients with most common factors being infection (25.3 %) followed by trauma, medications or summer season (14.3 %).

Table 1 depicts the socio-demographic and clinical characteristics of patients with and without the nail involvement. Males (185; 56.4 % in nail changes group and 29; 69.0 % in no nail changes group) were preponderant in our study ($P = 0.118$). The mean age of psoriasis patients with and without nail involvement were 44.53 ± 13.85 and 39.29 ± 16.08 years respectively ($P = 0.02$). The mean age of onset of psoriasis was 37.52 ± 13.76 years in patients

with nail changes and 35.12 ± 17.15 years in patients without nail changes ($P = 0.38$). The duration of skin psoriasis ranged from 2 weeks - 40 years with a mean duration of 6.52 ± 7.15 years and but duration was longer in patients with nail involvement (6.81 ± 7.42 years) than without nail involvement (3.83 ± 3.98 years) ($P = 0.018$).

Parameters		Nail Changes (N = 328)	No Nail Changes (N = 42)	P-Value
Gender, n (%)	Male	185 (56.4)	29 (69.0)	0.118*
	Female	143 (43.6)	13 (31.0)	
Age (years), mean \pm SD		44.53 \pm 13.85	39.29 \pm 16.08	0.02***
Duration of psoriasis (years), mean \pm SD		6.81 \pm 7.426	3.83 \pm 3.987	0.018**
Age of onset of psoriasis (years), mean \pm SD		37.52 \pm 13.769	35.12 \pm 17.15	0.387***
Joint involvement, N (%)		95 (29.1)	9 (22.0)	0.341*
Duration of joint involvement		3.70 \pm 4.82	3.85 \pm 3.47	0.512**
Age at joint involvement (years), mean \pm SD		45.63 \pm 12.0	35.92 \pm 14.61	0.024***
Family history of psoriasis, n (%)		9 (2.7)	9 (21.4)	< 0.001*
BSA % in mean \pm SD		10.79 \pm 18.71	6.09 \pm 8.39	0.035**
PASI mean \pm SD		6.97 \pm 7.32	4.16 \pm 4.00	0.007**
Scalp involvement, n (%)		150 (45.7)	6 (14.3)	< 0.001*
S-mPASI, mean \pm SD		1.76 \pm 1.051	1.43 \pm 0.87	0.426**
Type of psoriasis, n (%)	a. Chronic Plaque			0.001*
	(i) Palmoplantar	294 (89.6)	42 (100)	
	(ii) Inverse	64 (19.5)	18 (42.9)	
	b. Guttate	2 (0.6)	0	
	c. Erythrodermic	4 (1.21)	0	
	d. Pustular	10 (3.04)	0	
	e. Nail Psoriasis	12 (3.65)	0	
Body surface area percentage (mean \pm SD)		10.798 \pm 18.71	6.095 \pm 8.39	0.035
Psoriasis area severity score (mean \pm SD)		6.97 \pm 7.32	4.16 \pm 4.00	0.007

Table 1. Sociodemographic and Clinical Characteristics of Patients with and without Nail Changes

² Test; ** Mann Whitney U Test; *** Student T test

Family history of psoriasis was present in 18 (4.9 %) patients only, mostly involving 1st degree relatives (16; 88.9 %). Positive family history of psoriasis was present in 9 (2.7 %) patients with nail changes and 9 (21.4 %) patients without nail changes ($P < 0.001$). About one-third of patients (104; 28.1 %) had history of joint involvement in the form of joint pain. The duration of joint involvement ranged from 1 week - 20 years with a mean of 3.58 ± 4.66 years. The age of onset of joint involvement ranged from 16 - 80 years with a mean of 44.82 ± 12.46 years. Out of these, knee involvement was seen in 56 (53.8 %) patients followed by proximal interphalangeal (48; 46.1 %) and distal interphalangeal (48; 46.1 %) joint involvement followed by metacarpophalangeal joint involvement (40; 38.46 %). Joint involvement was found in 29.1 % patients with nail changes and 22 % without nail changes ($P = 0.341$). The mean age of onset of joint involvement was 45.63 ± 12.0 years in patients with nail changes and 35.92 ± 14.61 years in without nail changes ($P = 0.02$).

Scalp involvement was seen in 156 (42.1 %) patients. The mean Scalp Modified Psoriasis Area and Severity Index (S-mPASI) was 1.75 ± 1.04 with values ranging from 0.1 - 4.8. Scalp changes were present in 150 (45.7 %) patients with nail changes and 6 (14.3 %) patients without nail changes ($P < 0.001$), however, S-mPASI was 1.76 ± 1.05

in patients with nail changes and 1.43 ± 0.87 in patients without nail changes ($P = 0.42$).

Among the recruited psoriasis patients, majority 336 (90.8 %) patients had chronic plaque psoriasis followed by pustular 12 (3.2 %), erythrodermic 10 (2.7 %) and guttate 4 (1.08 %) variant. Nail psoriasis the only manifestation was present in 12 (3.2 %) patients. Most of the patients had chronic plaque psoriasis both in nail changes and no nail changes group (294; 89.6 % and 42; 100 % respectively). Palmoplantar variant was present in 64 (19.5 %) patients with nail changes, and in 18 (42.9 %) patients without nail changes ($P < 0.001$). Pustular psoriasis, erythrodermic, guttate and inverse psoriasis were seen only in patients with nail changes group.

Mean BSA was 10.26 ± 17.29 % with values ranging from 0 - 95 %. Mean BSA was 10.798 ± 18.71 in patients with nail changes and 6.095 ± 8.39 in patients without nail changes ($P = 0.035$). Amongst them, 196 (52.9 %) had BSA > 3. However, 180 (54.9 %) patients had BSA > 3 in nail changes and 16 (38.1 %) in without nail changes ($P = 0.043$). Mean PASI was 6.65 ± 7.08 with values ranging from 0 - 38.8. Mean PASI was 6.97 ± 7.32 in patients with nail changes and 4.16 ± 4.00 without nail changes ($P = 0.007$). Amongst them, 158 (42.7 %) had PASI > 5. However, 150 (45.7 %) patients had PASI > 5 in nail changes and 8 (19.0 %) without nail changes ($P = 0.002$).

Though, there was no association observed with and without nail changes with gender, age, duration of psoriasis, age of onset of psoriasis, joint involvement and duration of joint involvement in univariate analysis except for family history of psoriasis, BSA > 3 %, PASI > 5, scalp involvement and palmoplantar psoriasis. On multivariate analysis, female gender (adjusted odds ratio = 2.180, $P = 0.041$), age of onset of psoriasis > 30 years (adjusted odds ratio = 2.223, $P = 0.030$), absence of family history of psoriasis (adjusted odds ratio = 0.106, $P < 0.001$) and scalp involvement (adjusted odds ratio 6.37, $P < 0.001$) were found to be associated with psoriasis patients with nail involvement (Table 2). The age of onset of skin, nail involvement and joint involvement correlated significantly to each other. The age of onset of nail and joint involvement had stronger positive correlation ($r = 0.838$, $P < 0.001$) as compared to age of onset of skin changes with age of onset of nail changes ($r = 0.799$, $P < 0.001$) and age of onset of joint ($r = 0.742$, $P < 0.001$). The mean NAPSII score was 26.88 ± 24.38 in patients with nail changes. There was a moderate positive correlation of total NAPSII ($r = 0.32$, $P < 0.001$), finger nail NAPSII ($r = 0.238$, $P < 0.001$) and toe nail NAPSII ($r = 0.29$, $P < 0.001$) with PASI.

The mean PASI was 7.265 ± 7.153 vs. 6.189 ± 7.153 in patients with > 10 vs. ≤ 10 total NAPSII score ($P = 0.011$). Similarly, the mean PASI was high in patients with high fingernail NAPSII score > 10 (8.409 ± 9.023) than fingernail NAPSII ≤ 10 score (5.156 ± 5.095) and was also high for toenail NAPSII score > 10 (7.711 ± 7.274) as compared to toenail NAPSII score ≤ 10 score (6.412 ± 7.626). There was no correlation observed in patients with high PASI and sex, duration of psoriasis, age of onset of psoriasis, family history of psoriasis, joint involvement, duration of joint involvement and onset of joint involvement.

	Variables	Nail Changes (N = 328)	No Nail Changes (N = 42)	Odds Ratio (95 % Confidence Interval)	P-Value	Adjusted Odds Ratio (95 % CI)	P-Value
Gender	Male	185 (56.4 %)	29 (69.0 %)	Ref		Ref	
	Female	143 (43.6 %)	13 (31.0 %)	1.724 (0.865 - 3.436)	0.122	2.180 (1.032 - 4.606)	0.041
Age (Years)	≤ 50 years	60 (18.1)	16 (38.1)	Ref		Ref	
	> 50 years	268 (81.7)	26 (61.9)	1.486 (0.704 - 3.136)	0.299		
Duration of Psoriasis	≤ 5 years	190 (57.9 %)	28 (66.7 %)	Ref		Ref	
	> 5 years	138 (42.1 %)	14 (33.3 %)	1.453 (.737 - 2.861)	0.280		
Age at Onset of Psoriasis	≤ 30 years	99 (30.2 %)	19 (45.2 %)	Ref		Ref	
	> 30 years	229 (69.8 %)	23 (54.8 %)	1.911 (0.996 - 3.667)	0.051	2.223 (1.078 - 4.584)	0.030
Family History of Psoriasis	Absent	319 (97.3 %)	33 (78.6 %)	Ref		Ref	
	Present	9 (2.7 %)	9 (21.4 %)	0.103 (0.038 - 0.279)	< 0.001	0.106 (0.035 - 0.322)	< 0.001
Joint Involvement	Absent	233 (71 %)	33 (78 %)	Ref		Ref	
	Present	95 (29 %)	9 (22 %)	1.501 (0.692-3.258)	0.304		
Duration of Joint Involvement	≤ 5 years	76 (80.0 %)	6 (66.7)	Ref		Ref	
	> 5 years	19 (20.0 %)	3 (33.3)	0.500 (0.114-2.184)	0.357		
Onset of Joint involvement	≤ 30 years	30 (31.5)	4 (44.5)	Ref		Ref	
	> 30 years	65 (68.5)	5 (55.6)	1.733 (0.4343 - 6.9185)	0.4360		
Body Surface Area	≤ 3 %	148 (45.1 %)	26 (61.9 %)	Ref		Ref	
	> 3 %	180 (54.9 %)	16 (38.1 %)	1.976 (1.022 - 3.822)	0.043	1.033 (0.454-2.351)	0.938
Psoriasis Area Severity Score	≤ 5	178 (54.3 %)	34 (81.0 %)	Ref		Ref	
	> 5	150 (45.7 %)	8 (19.0 %)	3.581 (1.609 - 7.972)	0.002	1.465 (0.517 - 4.154)	0.472
Scalp Involvement	Absent	178 (54.3)	36 (85.7)	Ref		Ref	
	Present	150 (45.7)	6 (14.3)	5.056 (2.074 - 12.327)	< 0.001	6.37 (2.455 - 16.563)	< 0.001
Palmoplantar	Absent	264 (80.5)	24 (57.1)	Ref		Ref	
	Present	64 (19.5)	18 (42.9)	0.323 (0.166 - 0.631)	0.001	0.530 (0.247 - 1.137)	0.103

Table 2. Univariate and Multivariate Analysis of Clinico-Epidemiologic Characteristics of Psoriatic Patients with and without Nail Changes

Psoriasis affected quality of life in 328 (88.6 %) patients and 168 (45.4 %) patients had very large to extremely large effect on quality of life. While comparing the DLQI in these patients with nail involvement and without nail involvement, there was no statistically difference found between the groups (Figure 1). The mean DLQI score was 11.26 ± 9.85 (median = 9) with score ranged from 0 - 29. The mean score of symptoms and feelings were 3.55 ± 1.82 (median = 4) followed by daily activities 2.37 ± 2.04 (median = 2), leisure 1.87 ± 1.80 (median = 2), treatment 1.29 ± 1.13 (median = 1), work and school 1.02 ± 1.20 (median = 0) and personal relationship 0.71 ± 1.26 (median = 0).

The mean DLQI was 11.59 ± 10.12 in patients with nail changes and 8.66 ± 6.87 in patients without nail changes ($P = 0.10$). Mean score of symptoms and feelings were 3.57 ± 1.86 in nail group and 3.31 ± 1.16 in no nail group followed by daily activities 2.41 ± 2.06 in nail group and 1.84 ± 1.83 in no nail group, leisure 1.92 ± 1.80 in nail and 1.23 ± 1.70 in no nail, treatment 1.35 ± 1.13 in nail and 0.54 ± 0.19 in no nail, work and school 1.01 ± 1.19 in nail and 1.15 ± 1.38 in no nail, personal relationship 0.74 ± 1.28 in nail and 0.38 ± 0.94 in no nail. Statistical difference was significant in leisure ($P = 0.03$) and treatment ($P < 0.001$) domain amongst patient with and without nail changes (Table 3). As the BSA, PASI and NAPS I increased, the quality of life decreased with high DLQI scores ($P < 0.001$). However, it showed moderate positive correlation between PASI and DLQI ($r = 0.35$, $P < 0.001$) and BSA and NAPS I had weak positive correlation ($r = 0.29$, $P < 0.001$ and $r = 0.28$, $P < 0.001$). Fingernail and toenail NAPS I had also very weak positive correlation ($r = 0.14$, $P < 0.007$; $r = 0.28$, $P < 0.001$). There was no correlation observed in patients with high DLQI score > 10 and age, sex, age of onset of psoriasis, duration of psoriasis, family history of psoriasis, duration of joint involvement, nail involvement, NAPS I, fingernail NAPS I and toenail NAPS I.

Age of onset of joint involvement > 30 years (odds ratio = 4.333, $P = 0.002$), BSA > 3 % (odds ratio = 3.068, $P < 0.001$) and PASI > 5 (odds ratio = 3.068, $P < 0.001$) had

large to extremely large effect on quality of life (DLQI > 10) in univariate analysis, and it was also found that independent factors in multivariate analysis [age of onset of joint involvement > 30 years (adjusted odds ratio = 4.76, $P = 0.001$), BSA > 3 % (adjusted odds ratio = 3.211, $P = 0.02$) and PASI > 5 (adjusted odds ratio = 4.535, $P = 0.001$)] were found to be associated with psoriasis patients with nail involvement (Table 4).

Dermatology Life Quality Index (DLQI)	Nail Changes (mean \pm SD)	No Nail Changes (mean \pm SD)	Mann Whitney U Test	P Value
Total Dermatology Life Quality Index	11.59 \pm 10.12	8.66 \pm 6.87	1.42	0.10
Score	3.57 \pm 1.86	3.31 \pm 1.16	0.81	0.42
Physical symptoms and feeling Daily				
activities	2.41 \pm 2.06	1.84 \pm 1.83	1.36	0.18
Leisure	1.92 \pm 1.80	1.23 \pm 1.70	2.16	0.03
Work / School	1.01 \pm 1.19	1.15 \pm 1.38	0.27	0.79
Personal relationship	0.74 \pm 1.28	0.38 \pm 0.94	1.85	0.07
Treatment	1.35 \pm 1.13	0.54 \pm 0.19	3.75	< 0.001

Table 3. Dermatology Quality of Life Characteristics of Patients with (N = 328) and without Nail Changes (N = 42)

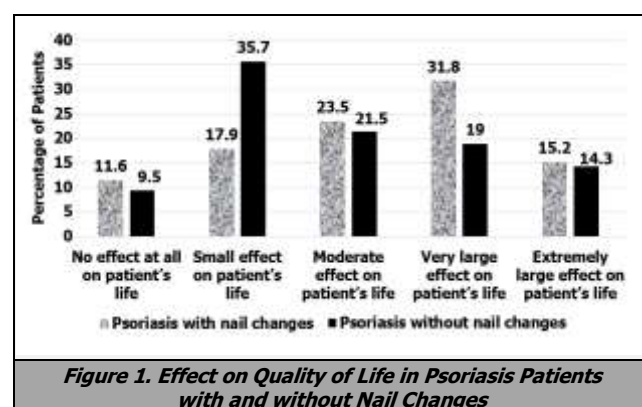


Figure 1. Effect on Quality of Life in Psoriasis Patients with and without Nail Changes

Variables	Category	DLQI < 10 N (%)	DLQI > 10 N (%)	Odds Ratio (95 % Confidence Interval)	P-Value	Adjusted Odds Ratio (95 % CI)	P-Value
Gender	Male	113 (55.9)	101 (60.1)	Ref			
	Female	89 (44.1)	67 (39.9)	0.842 (0.556 - 1.276)	0.418		
Onset of psoriasis	≤ 30 years	61 (30.2)	57 (33.9)	Ref			
	> 30 years	138 (69.3)	114 (66.7)	0.842 (0.543 - 1.306)	0.444		
Duration of psoriasis	≤ 5 years	121 (60.8)	97 (56.7)	Ref			
	> 5 years	78 (39.2)	74 (43.3)	1.196 (0.789 - 1.813)	0.398		
Family history of psoriasis	Absent	187 (94.0)	165 (96.5)	Ref			
	Present	12 (6.0)	6 (3.5)	0.567 (0.208 - 1.454)	0.267		
Onset of joint involvement	≤ 30 years	8 (16.7)	26 (46.4)	4.333 (1.722 - 10.907)	0.002	4.746 (1.782 - 912.639)	0.001
	> 30 years	40 (83.3)	30 (53.5)	Ref			
Duration of joint involvement	≤ 5 years	39 (81.2)	43 (76.8)	Ref			
	> 5 years	9 (18.8)	13 (23.2)	1.667 (0.478 - 5.817)	0.423		
Body surface area	≤ 3 %	101 (50.8)	43 (25.1)	Ref			
	> 3 %	98 (49.2)	128 (74.9)	3.068 (1.969 - 4.780)	< 0.001	3.211 (1.076 - 9.583)	0.02
Psoriasis area severity score	≤ 5	150 (74.3)	62 (36.9)	Ref			
	> 5	52 (25.7)	106 (63.1)	4.610 (2.963 - 7.171)	< 0.001	4.535 (1.831 - 11.234)	0.001
Nail involvement	Absent	28 (13.9)	14 (8.3)	Ref			
	Present	174 (86.1)	154 (91.7)	1.770 (0.899 - 3.484)	0.098		
Nail Psoriasis Severity Index	≤ 10	55 (30.1)	50 (31.6)	Ref			
	> 10	125 (69.9)	111 (68.9)	0.916 (0.579 - 1.449)	0.709		
Finger nail Psoriasis Severity Index	≤ 10	68 (53.5)	68 (58.6)	Ref			
	> 10	59 (46.5)	48 (41.1)	0.814 (0.489 - 1.352)	0.426		
Toe Nail Psoriasis Severity Index	≤ 10	72 (43.9)	58 (39.2)	Ref			
	> 10	92 (56.1)	90 (60.8)	1.214 (0.773 - 1.908)	0.399		

Table 4. Sociodemographic and Clinical Characteristics of Patients with Psoriasis with Dermatology Life Quality Index ≤ 10 and >10

DISCUSSION

Very few large studies have focussed on epidemiology of nail involvement in psoriasis and there is wide disparity with documented prevalence varying from 10 - 81.8 %.⁵⁻¹⁴ Our study showed that 88.6 % of psoriasis patients had nail involvement, with 3.2 % having nail changes alone while others reported 5 - 10 % manifesting with nail changes alone.^{13,14}

Augustin et al. reported nail psoriasis to be slightly more prevalent in men¹⁰. In our study also nail involvement in males (56.4 %) was more. The reason may be higher awareness amongst males for their health status while negligence and social restrictions imposed on females could be the reason. However, females were more likely to develop nail changes as compared to no nail involvement group (43.6 % vs. 31 %) (P = 0.041).

The mean age of psoriasis patients with nail involvement were higher than no nail involvement (44.53 ± 13.85; 39.29 ± 16.08 years) (P = 0.02). Almost similar findings were reported by Prabhakar et al. with mean age of psoriasis patients in nail and no nail involvement being 43.62 ± 15.31 vs. 33.04 ± 12.80 years (P = 0.02)¹⁹.

In our study, majority (69.8 %) of the patients presented with psoriasis onset at age > 30 years. However, there was no difference in the disease onset in patients with nail involvement (37.52 ± 13.76) and without nail involvement (35.12 ± 17.15 years). Similar to our study Darjani et al. also did not find the difference.²⁰ However, contradictory to ours, longer disease duration was found in patients with nail involvement (21.9 years) than without (18.1 years) nail involvement in the literature¹⁰. The mean duration of skin psoriasis was 6.52 ± 7.15 years and but the duration was significantly longer in patients with nail involvement (6.81 ± 7.42 years) than patients without nail involvement (3.83 ± 3.98 years) in our study. Velden et al. and Brazzelli et al. reported the duration of disease as 19 years and 5.23 ± 11.32 years, respectively.^{11,21}

Positive family history has been found amongst 2 % to 91 % of psoriatic patients.^{22,23} In our study, a family history

of psoriasis was present in only 4.9 % of patients and the patients with nail involvement had less family history of psoriasis than without nail involvement (2.7 % vs. 21.4 %). This is contradictory to the study by conducted by Augustin et al., Darjani et al. and Schones et al. who reported high rates of positive family history in patients with nail involvements.^{10,20,24}

The documented prevalence of psoriatic arthritis varies in literature from approximately 7 % to 40 % of psoriasis patients.²⁵⁻²⁹ In our study, we found history of joint involvement present in 28.1 % patients, however, there was no difference of joint involvement with and without nail changes.

It is also well known that there is an association between psoriatic arthritis and nail psoriasis³⁰, which often precedes the disease rather than just accompanying it and the severity of nail disease correlates with indicators of severity of joint disease.³¹ In our study, mean age of onset of joint and nail involvement was 44.82 years and 42.33 years respectively. Also, age of onset of nail and joint involvement had a strong positive correlation (r = 0.838) in our study (P < 0.001).

There have been many studies regarding correlation between nail psoriasis, and the pattern of skin involvement (e.g., plaque, guttate, pustular, erythrodermic).³² We also found that patients with pustular psoriasis, erythrodermic, guttate and inverse psoriasis had nail involvement in 100 % cases. However, no significant difference was found in percentage of chronic plaque psoriasis in patients with nail changes (89.6 %) and without nail changes (100 %). On the other hand, we did find a relation between palmoplantar psoriasis and no nail involvement (P = 0.001).

The nail involvement had higher PASI score than those without nail involvement in the study done by Augustin et al. and Darjani et al. (13.5 ± 10.7 vs. 10 ± 8.6 and 11.7 ± 5.7 vs. 5.7 ± 4.5 respectively).^{10,20} In our study also, we got PASI scores higher for patients with nail involvement (6.97 ± 7.32) than without nail involvement (4.16 ± 4.00).

Obviously visible areas of body like nails (fingernails more than toenails), have quite negative influence on physical, psychological and social well-being of patient. This

impact of nail disease on quality of life have not been thoroughly investigated previously. Apart from cosmetic issue, intact healthy nails also play crucial role in a protection of digits from mechanical and chemical trauma, tactile discrimination and fine motor activities. So, any abnormality in the nail unit may compromise all above mentioned functions as well.

De Jong et al. also reported nail psoriasis affecting daily life of patients and causing varying degree of physical impairment and inability to co-ordinate muscle activity, including patient's ability to pick fine objects.⁶

In our study, the mean DLQI score was 11.26 with maximally affected being symptoms and feeling (3.55) domain followed by daily activities (2.37), leisure (1.87), treatment (1.29), work and school (1.02) and personal relationship (0.71). 45.4 % patients had very large to extremely large effect on quality of life. However, statistical difference was found only in leisure domain ($P = 0.03$) and treatment domain ($P < 0.001$) amongst patient with and without nail changes. However, Klaassen, van de Kerkhof and Pasch reported nail involvement associated with greater impairment in all domains.³²

In our study, there was moderate positive correlation between PASI and DLQI ($r = 0.35$) while BSA and NAPS I had weak positive correlation ($r = 0.29$ and 0.28) ($P < 0.001$). Finger nail and toe nail NAPS I had also very weak positive correlation ($r = 0.14$, $P = 0.007$; $r = 0.28$, $P < 0.001$).

Nail changes in psoriasis, apart from being perceived as disease of mere inconvenience; is a disease of great consequences as well. Clinicians in their practice should nurture the habit of not only identifying the nail involvement in psoriasis but also to manage accordingly to meet the high needs of the patients.

CONCLUSIONS

Nail involvement in psoriasis is very common. It is an important finding in determining the severity of skin involvement and had very large to extremely large effect on quality of life in approximately half of the patients. Leisure and treatment domains were affected more amongst patients with nail changes. Therefore, nail examination must be done in all patients.

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