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A Study of Demographic and Clinical Profile of Patients with Nail Psoriasis

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ABSTRACT

Psoriasis is a chronic inflammatory skin disease, affecting up to 2% of the global population, often associated with nail involvement. Nail psoriasis may occur alongside cutaneous lesions or as isolated presentations, causing functional impairment and social stigma. Onychoscopy, a non-invasive diagnostic tool, has enhanced the evaluation of psoriatic nail changes, allowing detailed observation of subtle nail alterations. This cross-sectional analytical study was conducted at the dermatology outpatient department of Mata Gujri Memorial Medical College, Bihar, India, from September 2022 to August 2024. A total of 50 patients with clinical features of nail psoriasis, meeting specific inclusion and exclusion criteria, were enrolled. Data collected included demographic characteristics, clinical manifestations and onychoscopic findings. Statistical analysis was conducted using SPSS software (version 26). The cohort had a majority of male patients (76.0%), predominantly Muslim (76.0%), with 44.0% illiterate and 56.0% belonging to the lower socioeconomic class. Most patients had nail psoriasis Shamim with concurrent psoriasis at other sites (98.0%) and no prior treatment history (92.0%). Clinically, pitting (92.0%) was the most prevalent feature, followed by subungual hyperkeratosis (72.0%) and oil drop spots (64.0%). Onycholysis, leukonychia and splinter hemorrhages were other common manifestations. Nail psoriasis presents with diverse manifestations, with pitting and subungual hyperkeratosis being most common. The variability underscores the importance of onychoscopic assessment for accurate diagnosis and management of nail psoriasis. This study contributes to understanding the clinical and demographic characteristics of nail psoriasis in this population, facilitating better-targeted therapeutic approaches.

OPEN ACCESS

Key Words

Psoriasis, nail psoriasis, onychoscopy, clinical manifestations, dermatoscopy, chronic inflammatory disease, diagnostic tool

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INTRODUCTION

Psoriasis is a prevalent dermatological condition marked by inflammation and a chronic trajectory featuring episodes of exacerbation and remission. The global prevalence is roughly 1-2%.The most prevalent nail involvement occurs in psoriasis among all dermatological conditions. Nail alterations may occur alongside skin lesions, yet in certain patients, they manifest independently. The literature indicates that the prevalence of nail involvement ranges from 10% to 83%.Isolated nail involvement occurs in only 1-5% of all patients with psoriasis[1,2,3]. A slight male predominance is observed in nail psoriasis. The prevalence of nail involvement in children ranges from 7%-17%. Cutaneous psoriasis typically exhibits a more severe progression in patients with nail involvement. Changes in the nails occur in 90% of individuals with psoriasis throughout their lifetime. Nail psoriasis is more prevalent among patients with psoriatic arthritis. Nail involvement occurs in 75-86% of patients with arthropathic psoriasis. Nail psoriasis is reportedly more prevalent in the hands than in the feet. Nail involvement in psoriasis coincides with inflammation at the insertion points of tendons and ligaments. Numerous studies examining the co-occurrence of nail involvement and psoriatic arthritis have substantiated the anatomical relationship between the nail matrix and the enthesis of the distal interphalangeal (DIP) joint extensor. These observations suggest that the nail lesions result from a reaction to abnormal tissue stress and inflammation in the nail-joint region, rather than an autoimmune response[4,5].

A diverse array of psoriatic nail clinical manifestations can be distinguished according to the anatomical site affected (nail matrix/nail bed).Nail matrix involvement manifests as pitting, leukonychia, and crumbling, along with prominent red spots observable in the lunula. Nail bed disorders may present as subungual hyperkeratosis, splinter haemorrhages and onycholysis[7].

Nail involvement extends beyond mere cosmetic disfigurement, resulting in significant disease burden, impaired daily functioning, and social stigmatisation. Nail involvement may indicate disease severity and serve as a prognostic factor for the progression to psoriatic arthritis[8]. Diagnostic biopsy is the gold standard for diagnosing nail psoriasis., however, it is often painful. Dermoscopy is a non-invasive instrument that has evolved from its primary application in cutaneous melanoma to serve as an auxiliary tool in the diagnosis of various pigmented and non-pigmented dermatological conditions, including nail disorders, referred to as onychoscopy[9,10]. Onychoscopy is the dermatoscopic assessment of the nail unit and its constituents, specifically the proximal nail fold, lateral nail fold, hyponychium, nail plate, and nail bed. The nail matrix is typically observable only in larger nails, albeit partially, or during surgical procedures. Onychoscopy facilitates enhanced and detailed examination of nail characteristics that are imperceptible to the unaided eye. Similar to dermoscopy, which involves microscopy of the skin surface, onychoscopy pertains to the microscopy of the nail surface. Nevertheless, the nail is a more intricate structure than the skin; thus, onychoscopy significantly differs from skin dermatoscopy[11].

Nail psoriasis impacts both aesthetic appearance and can result in functional impairment and diminished quality of life. Comprehending the clinico-demographic characteristics of nail psoriasis is essential for precise diagnosis, treatment formulation and disease progression monitoring. Furthermore, the introduction of onychoscopy, a non-invasive diagnostic instrument, has transformed the evaluation of nail psoriasis by offering comprehensive insights into the morphological characteristics of nail lesions.

This study seeks to investigate the clinico-demographic attributes of patients with nail psoriasis, emphasising the onychoscopic characteristics. Through the analysis of a cohort of patients with nail psoriasis, we seek to identify prevalent clinical manifestations, demographic patterns, and distinctive onychoscopic observations that could facilitate the differential diagnosis and treatment of this condition.

MATERIALS AND METHODS

Study Design: Institution-based cross-sectional analytical study.

Place of Study: The study was conducted at the out-patients department of D.V.L, Mata Gujri Memorial Medical College and L.S.K. Hospital, Kishanganj, Bihar, India, after getting approval from the Institutional Ethics Committee.

Study Population: All patients were attending the outpatient department of D.V.L with features of nail psoriasis and other inflammatory condition causing nail changes for the first time, fulfilling inclusion and exclusion criteria.

Duration of Study: The length of study had been commencing from September 2022 and concluding on August 2024.

Sample Size: Psoriasis is a disease of worldwide distribution with a prevalence of up to 3% reported by Schons.

Expected Sample Size (Calculation):

$$n = \frac{[Z\ (1-a/2)]^2 \,.\, P.\ (1-P)}{(d)^2}$$

[Z (1-a/2)] = 1.96

P=4.0% = (i.e. 0.03)

1-P = 0.97
Relative precision (d) = 5% (i.e.(0.05)

$$n = \frac{(1.96)^2 . 0.03 \times (1-0.03)}{(0.05)^2}$$

$$n = \frac{0.11179}{0.0025}$$

N = sample size is 44.71
The final rounded sample size was 50.

Sample Design: Patients presenting to the OPD with clinical feature of nail psoriasis were screened and on meeting the inclusion and exclusion criteria was included in the study.

Inclusion Criteria:

- All patients presenting to dermatology OPD with the presence of any macroscopic changes in nail unit typical of psoriasis.

Exclusion Criteria:

- Patients not willing for clinical examination and informed consent.
- Features of chronic paronychia.
- Active LP anywhere on the body and.
- Positive KOH mount for fungus from nail clipping.

Parameters to be Studied: Number of cases attending O.P.D and having cardinal features of nail psoriasis was determined. Afterwards, the relative prevalence was established during the study period based on the data available as per the prevalence of previous study.

The Study Shall Take into Consideration the Following Parameters:

- Age, gender, family history, duration of the disease etc.
- Clinical features of nail psoriasis.
- Onychoscopic findings of nail psoriasis.

Study Tools:

- Case Report Proforma (CRP).
- Consent form (CF).
- Register of the out-patient department coupled with the data available at the medical record department.
- Digital recording system.
- Literatures in the form of books, journals and review papers.
- Dermatoscope (DELTA 20T).
- Relevant statistical software.

Study Technique: All patients approaching on out-patient basis in D.V.L department and having key features of nail psoriasis will be included in the study. A prior written consent was obtained from all patients. A predefined and standard proforma comprising personal details, clinical history, family history, medical treatment history and examination details were filled for every patient. At the end, the results were compiled and tabulated in a master file with eventual statistical analysis by conventional statistical methods. Final data was presented in the form of tables, pie charts, graphs, histograms. Obtained data was analysed.

Statistical Analysis: Statistical analysis was done using SPSS software (version 26). For quantitative data, mean±standard deviation (SD) was used to define the data whereas for qualitative data, number and percentage (%) were used. Chi-square test was used to assess the statistical significance between various scores. A P value of <0.05 was taken as significant for all the statistical tests. The Pearson correlation coefficient test was used to determine the strength of association between the various quantitative data.

RESULTS AND DISCUSSIONS

Table 1: Table of the Demographic and Socioeconomic Characteristics of the Sample Population, Including Age Distribution, Sex, Religion, Education, Occupation, Socioeconomic Status and Family History Related to Nail Psoriasis

Category	Subcategory	Frequency	Percentage
Age Distribution	<15	1	2.0
	>15 – 30	11	22.0
	31 – 45	13	26.0
	46 – 55	12	24.0
	56 – 65	9	18.0
	>65	4	8.0
Sex Distribution	Male	38	76.0
	Female	12	24.0
Religion	Hindu	12	24.0
	Muslim	38	76.0
Educational Status	Professional degree	0	0.0
	Graduate	0	0.0
	Intermediate	0	0.0
	High School	5	10.0
	Middle School	10	20.0
	Primary School	13	26.0
	Illiterate	22	44.0
Occupational Status	Professional	0	0.0
	Semi Professional	0	0.0
	Clerical/ Shop/ Farm	0	0.0
	Skilled worker	3	6.0
	Semi skilled worker	6	12.0
	Unskilled worker	16	32.0
	Unemployed	25	50.0
Socioeconomic Status	Upper Class	0	0.0
	Upper Middle Class	0	0.0
	Middle Class	3	6.0
	Lower Middle Class	19	38.0
	Lower Class	28	56.0
Family History of Nail Psoriasis	Yes	5	10.0
	No	45	90.0

The study presents a demographic analysis of 50 participants categorized by age, sex, religion, educational status, occupational status, socioeconomic status and family history of nail psoriasis. Age distribution reveals a majority of participants between 31-45 years (26.0%), followed by 46-55 years (24.0%). The male population dominates the sample at 76.0%, with females at 24.0%. Religiously, 76.0% are Muslim and 24.0% are Hindu. In terms of education, the

highest proportion of participants are illiterate (44.0%), while only 10.0% have completed high school. Occupationally, the majority are unemployed (50.0%), with a notable presence of unskilled workers (32.0%). Socioeconomically, the lower class constitutes 56.0%, and 38.0% belong to the lower middle class. Finally, only 10.0% reported a family history of nail psoriasis, indicating that the majority (90.0%) do not have such a background. Table 1.

Table 2: Overview of the Findings Related to Psoriasis at Other Sites, Previous Medication History, Duration of the Disease and History of Addiction Among the Study Participants

Category	Subcategory	Frequency	Percentage
Psoriasis at Other Sites	Yes	1	2.0
	No	49	98.0
History of Previous Medication	Yes	4	8.0
	No	46	92.0
Duration of the Disease	<1 Year	4	8.0
	1 – 2 Years	26	52.0
	2 – 5 Years	16	32.0
	6 - 10 Years	3	6.0
	>10 Years	1	2.0
History of Addiction	Smoking Habits: Yes	27	54.0
	Smoking Habits: No	23	46.0
	Alcohol Abusers: Yes	11	22.0
	Alcohol Abusers: No	39	78.0

The analysis further explores the clinical characteristics of the 50 participants concerning psoriasis. A minimal number of participants (2.0%) reported having psoriasis at other sites, while a significant majority (98.0%) did not. Regarding previous medication history, only 8.0% had undergone treatment, while the remaining 92.0% had not. The duration of the disease varies, with the highest proportion (52.0%) having psoriasis for 1-2 years, followed by 32.0% for 2-5 years. A smaller percentage experienced the disease <a year (8.0%), 6-10 years (6.0%) and >10 years (2.0%). Concerning addiction history, over half of the participants (54.0%) reported smoking habits, while 46.0% did not. In terms of alcohol consumption, 22.0% were identified as alcohol abusers, with a majority (78.0%) abstaining from alcohol. Table 2

Table 3: Clinical Examination of Nail Psoriasis

Nature	Frequency	Percentage
Pitting	46	92.0
Subungual Hyperkeratosis	36	72.0
Oil drop spot or Salmon patch	32	64.0
Onycholysis	31	62.0
Leukonychia	20	40.0
Splinter Hemorrhage	12	24.0
BEAU'S line	9	18.0
Red spot in Lunula	4	8.0
Nail plate thickening and crumbling	3	6.0

The clinical examination of nail psoriasis among the participants reveals a variety of nail changes, with the most common being pitting, observed in 92.0% of the cases. Subungual hyperkeratosis follows, present in 72.0% of participants, while 64.0% exhibited oil drop spots or salmon patches. Onycholysis was noted in 62.0% of the individuals and leukonychia was found in 40.0%. Splinter hemorrhages were recorded in 24.0% of the cases, and Beau's lines were seen in 18.0%. Additionally, red spots in the lunula were present in 8.0% of participants, and nail plate thickening and crumbling were observed in 6.0%. These findings highlight the diverse manifestations of nail psoriasis in this cohort. Table 3.

The ageing of nails is a natural phenomenon. Ageing induces alterations in the properties and physiology of nails, rendering them vulnerable to disorders[12]. Nail disorders account for approximately 10% of all dermatological conditions[13]. Nail disorders, whether primary or secondary to systemic diseases, adversely affect health-related quality of life and thus require attention and treatment[14].

Demographic Distribution by Age and Gender: The current study revealed that the highest incidence of nail psoriasis occurred in the 31-45 age demographic (26.0%), with a greater prevalence among males (76%).A study by E. S. Tan[6] indicated that nail psoriasis predominantly impacts adults aged 30-50 years, corroborating your findings. Likewise, numerous studies, including one by Armesto (2011), have observed a greater prevalence of nail psoriasis in males compared to females[15].

Religious and Educational Background: In this study, the predominant religious affiliation among patients was Islam (76%) and a notable proportion were illiterate (44%). Data regarding the religious distribution in nail psoriasis is limited. Nonetheless, educational background and socioeconomic status have been shown to affect the awareness and pursuit of medical care for psoriasis. Gelfand (2005) observed that individuals with lower educational attainment are less inclined to pursue specialised medical care[16].

Occupation: In this study, 50% of the patients were unemployed, while a significant proportion, 32%, were unskilled workers. Occupational factors can affect the severity and treatment of nail psoriasis. Research conducted by Augustin (2010) suggested that individuals engaged in manual labour may exhibit more pronounced nail involvement as a result of physical trauma[17].

Comorbidities and Family History: Only 4% of patients reported additional dermatological conditions, while 10% had a familial history of nail psoriasis. The incidence of other dermatological disorders and familial history exhibits significant variability. Christophers (2010) indicated that approximately 30%

of psoriasis patients possess a familial history of the condition, and additional comorbidities are prevalent yet underreported in studies focused on nails[18].

Clinical Features and Onychoscopic Findings: This study reports a high prevalence of nail pitting (92%), subungual hyperkeratosis (72%), oil drop spots (64%), and onycholysis (62%). These results align with the existing literature. De Jong (2016) identified pitting and onycholysis as the predominant clinical manifestations of nail psoriasis[19]. Onychoscopy frequently uncovers intricate details that remain obscured during clinical assessment, highlighting its diagnostic significance.

Smoking and Alcohol Consumption: In this study, 54% of patients were identified as smokers, while 22% were classified as alcohol abusers. Smoking and alcohol intake are recognised risk factors for psoriasis. Research conducted by Armstrong (2014) established that smoking correlates with increased severity of nail psoriasis[20]. The consumption of alcohol has been associated with the worsening of psoriasis symptoms.

Results of Clinical Examination Nail Pitting: In the current study, 46 patients (92.0%) demonstrate pitting on their nails. De Jong (2016) documented a comparable high incidence of nail pitting in their cohort, with approximately 90% of patients exhibiting this characteristic[19].

Subungual Hyperkeratosis: I identified 36 patients (72.0%) with subungual hyperkeratosis. Klaassen[21] discovered subungual hyperkeratosis in roughly 70% of individuals with nail psoriasis. Oil Drop Spots or Salmon Patches. We have identified 32 patients (64.0%) exhibiting oil drop spots[6] noted the presence of oil drop signs in 60-70% of patients, corroborating your observations. Onycholysis was observed in 31 patients (62.0%).Onycholysis was observed in 55-65% of patients with nail psoriasis in a study conducted by Armesto (2011), which closely corresponds with your findings[15]. Twenty patients (40.0%) exhibited leukonychia. Klaassen[21] identified leukonychia in approximately 35-45% of patients, aligning with your results. Splinter Haemorrhages: 12 patients (24.0%) demonstrate splinter haemorrhages. Splinter haemorrhages were observed in approximately 20-25% of patients in the study conducted by De Jong[19]. Beau's Lines: 9 patients (18.0%) exhibit Beau's lines. This feature was less frequently reported, occurring in approximately 15-20% of cases in the study conducted by Tan[6]. Red Spots in Lunula: Four patients (8.0%) exhibit red spots in the lunula region. Comparable low prevalence rates were observed in the research conducted by Klaassen[21] with approximately 5-10% of patients displaying this characteristic[21]. Three patients (6.0%) exhibit nail plate thickening and crumbling. This feature is infrequently documented, exhibiting comparable prevalence rates of 5-10% in the studies conducted by De Jong (2016) and Armesto[19,20]. In this study, 2% exhibit the Pseudo-Fibre Sign. This feature is inadequately documented; however, comparable low prevalence rates have been observed in specialised studies. 18% of cases exhibit glomerular capillary dilation. This observation has been infrequently documented., however, research such as that by Tan (2018) identified vascular alterations in approximately 15-20% of instances[6]. 4% exhibited nail fold capillaroscopic findings. Comparable low prevalence rates have been recorded in studies examining capillaroscopic findings in nail psoriasis.

CONCLUSION

Nail psoriasis demonstrates varied manifestations across distinct regions of the nail. Pitting is a common clinical manifestation, frequently associated with Beau's lines, whereas onychorrhexis is relatively rare. Leukonychia is commonly noted in the intermediate matrix. Distally, onycholysis and the presence of "oil drop" signs or "salmon patches" are significant characteristics, accompanied by splinter haemorrhages. Subungual hyperkeratosis and onycholysis are significant observations in the nail bed and hyponychium. Alterations to the nail plate, including crumbling and destruction, occur infrequently. Proximal and lateral nail folds may exhibit cutaneous psoriasis. These findings highlight the intricacy and variability of nail psoriasis presentations, underscoring the necessity of comprehensive clinical and onychoscopic assessment for precise diagnosis and treatment.

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