

## Original Research Article

# Nail changes in various dermatoses: an observational study conducted at tertiary care center, Ujjain, Madhya Pradesh, India

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**Received:** 11 November 2019

**Revised:** 17 January 2020

**Accepted:** 20 January 2020

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### ABSTRACT

**Background:** Nail apparatus forms an integral part to be examined for all dermatological conditions. Nail changes are seen in various dermatosis like psoriasis, onychomycosis, lichen planus, collagen vascular disease, vesicobullous diseases and other papulosquamous diseases. Aims and objective of the study was to determine the prevalence of nail changes in various dermatological conditions.

**Methods:** After applying inclusion and exclusion criteria, 269 cases with various nail changes were enrolled in the study. Detailed history and thorough nail examination was carried out along with other necessary investigations like CBC, RFT, LFT, nail clipping for fungal hyphae culture and microscopy.

**Results:** Out of 269 cases with nail disorders, male to female ratio was 1.5:1 and most common age group was 31-40 years. The most common abnormality observed was onychomycosis (34.2%) followed by nail changes in psoriasis (30.4%), LP (18.5%), eczema (4%), trachonychia (3.3%), paronychia (2.9%), lichen striatus (2.2%) and darier's disease (0.37%). Among onychomycosis most common pattern observed was DLSO (82.6%) followed by PSO (7.6%), SWO (5.4%) and TDO (4.34%). The pattern of nail changes in psoriasis patients was pitting (30.4%), subungual hyperkeratosis (21.9%) and onycholysis (10.9%). Cases with LP had longitudinal striations (52%), thinning of nail plate and trachonychia (10% each). V shaped notching and distal splitting was seen in one of the Darier's disease patient.

**Conclusions:** Nail changes form an indispensable part of various dermatological conditions. The pattern of involvement is unique in each and every disease. Hence examination of all the 20 nails should never be missed.

**Keywords:** Nail, Epidemiological study, Ujjain

### INTRODUCTION

Ever since the days of Hippocrates (466-377BC) some diagnostic importance has been given to the nails.<sup>1</sup> Nails have been considered as a window for the diagnosis of dermatological and systemic conditions.

Nail changes are seen in various dermatosis like psoriasis, onychomycosis, lichen planus, collagen

vascular disease, vesico-bullous diseases and other papulosquamous diseases. Sometimes they may reflect the severity of skin disorders. Nail disorders comprise about 10% of all dermatological conditions.<sup>2</sup>

Nail disease may affect walking, picking of the fine objects, protective and tactile functions. Besides, the aesthetic aspect may impair the occupation, employment and interaction with other people.

Psoriasis is one of the commonest disease involving nails. It may be limited to nails without any other clinical presentation. Pitting, onycholysis, subungual hyperkeratosis, nail plate discolouration are the main findings observed. These findings depend upon the site of nail unit involvement and duration of the disease in patient. Lichen planus (LP) can affect nails in about 10% of cases.

Longitudinal ridges are the commonest and pterygium formation is a typical finding associated with LP. Other papulosquamous diseases like PRP, lichen nitidus, lichen striatus etc. can also involve the nail-units although less in proportion as compared to psoriasis and LP.

Among the infectious dermatosis, onychomycosis tops the list. *Trichophyton rubrum* is the most common aetiological agent isolates worldwide. Symptoms may include white or yellow nail discolouration, thickening of plate and its separation from nail bed. It represents about half of the nail disease and occurs in about 10% of adult population.

Apart from cosmetic and protective functions, nails also aid in diagnosing various dermatosis to clinician. Some nail findings are specific, others might be non-specific. This study emphasizes the value of nail findings to ascertain a dermatological disease. It is an attempt to highlight the abnormal nail finding seen in different dermatosis.

**METHODS**

This cross-sectional observational study was conducted in outpatient clinic in the department of dermatology, Ruxmaniben Deepchand Gardi Medical College, Ujjain to study the nail findings in various dermatosis. The study period was from January 2018 to January 2019. Informed consent was obtained from patients and from parents in case of children <12 years.

Total 269 cases with various nail changes who gave consent to participate in the study were included. Patients with nail changes due to trauma, systemic disease, occupational nail changes, neoplasm of nail and cosmetic induced nail changes were excluded. Detailed history including duration of skin and nail lesion, onset and progression, associated factors were noted in a special proforma. Thorough and detailed nail examination was carried out regarding the number of nail involvement, initial nail to be involved and the different types of nail changes.

Other necessary investigations like CBC, RFT, LFT and nail clipping for fungal hyphae culture and microscopy were taken in relevant cases. Biopsy of relevant skin lesions was done in doubtful cases. All this data was recorded in a proforma and tabulated in a master chart. The results were analysed and discussed in detail.

**RESULTS**

Out of 269 cases, majority of the patients belonged to the age group 31-40 years (28.9%) followed by 41-50 years (19.7%). Least incidence was observed in both extremes of age i.e. <10 and >60 yrs as shown in (Table 1).

Males dominated over females by comprising almost 59.8% of the total cases with male: female ratio of 1.5:1 as shown in (Table 2).

Maximum number of cases were in service 138 cases (51.3%) follows by housewives (22.6%) and least were ex-service man 17 cases (6.31%). 1 to 5 nails were involved in 133 cases (49.4%), 6 to10 nails in 114 cases (42.4%), 11 to 15 nails in 19 cases (7.2%) and 16 to 20 nails in 3 cases (1.1%). Onychomycosis were the most common finding in 92 cases (34.2%) followed by psoriasis 82 cases (30.4%), lichen planus 50 cases (18.5%), eczema 11 cases (4%), trachonychia 9 cases (3.3%), paronychia 8 cases (2.9%). few cases of lichen striatus 6 cases (2.2%), vesicobullous disorder (pemphigus) 4 cases (1.4%), leprosy 4 cases (1.4%), PRP 2 cases (0.75%), Darier's disease (0.3%) were also noted as shown in (Table 3).

Among onychomycosis the commonest pattern of Nail change observed was DLSO 76 cases (82.6%) followed by PSO 7 cases (7.6%) and SWO 5 cases (5.4%). The least common nail abnormality observed was TDO 4 cases (4.54%). Toenails were more frequently involved than finger nails as shown in (Table 4).

**Table 1: Incidence of nail changes among different age group (n=269).**

Age in years	No. of patients	Percentage (%)
<10	03	1.2
11-20	41	15.2
21-30	44	16.3
31-40	78	28.9
41-50	53	19.7
51-60	25	9.2
>60	25	9.2
<b>Total</b>	269	100

**Table 2: Sex distribution of patients with nail changes (n=269).**

Sex	No. of patients	Percentage (%)
<b>Male</b>	161	60
<b>Female</b>	108	40
<b>Total</b>	269	100

Maximum number of cases were in service 138 cases (51.3%) follows by housewives (22.6%) and least were ex-service man 17 cases (6.31%). 1 to 5 nails were involved in 133 cases (49.4%), 6 to10 nails in 114 cases (42.4%), 11 to 15 nails in 19 cases (7.2%) and 16 to 20

nails in 3 cases (1.1%). Onychomycosis were the most common finding in 92 cases (34.2%) followed by psoriasis 82 cases (30.4%), lichen planus 50 cases (18.5%), eczema 11 cases (4%), trachonychia 9 cases (3.3%), paronychia 8 cases (2.9%). few cases of lichen striatus 6 cases (2.2%), vesicobullous disorder (pemphigus) 4 cases (1.4%), leprosy 4 cases (1.4%), PRP 2 cases (0.75%), Darier's Disease (0.3%) were also noted as shown in (Table 3).

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**Table 3: Spectrum of nail changes (n=269).**

Nail disease	No. of patients	%
<b>Onychomycosis</b>	92	34.2
<b>Psoriasis</b>	82	30.4
<b>Lichen planus</b>	50	18.5
<b>Eczema</b>	11	4.0
<b>Trachonychia (20-nail dystrophy)</b>	9	3.3
<b>Paronychia</b>	8	2.9
<b>Lichen striatus</b>	6	2.2
<b>Vesicobullous</b>	4	1.4
<b>Leprosy</b>	4	1.4
<b>PRP</b>	2	0.75
<b>Darier's disease</b>	1	0.37
<b>Total</b>	269	100

**Table 4: Clinical pattern of onychomycosis (n=92).**

Morphological pattern	Fingernail	Toenail	Both	Total	%
<b>DLSO*</b>	24	32	20	76	82.7
<b>PSO**</b>	4	3	0	7	7.6
<b>SWO***</b>	0	3	2	5	5.4
<b>TDO#</b>	0	3	1	4	4.34
<b>Total</b>	28	41	23	92	100

**Table 5: Pattern of nail involvement in psoriasis (n=82).**

Nail changes	Fingernail	Toenail	Both	Total	%
<b>Pitting</b>	20	2	3	25	30.7
<b>Onycholysis</b>	1	1	7	9	10.9
<b>Subungual hyperkeratosis</b>	10	7	1	18	21.9
<b>Splinter hemorrhage</b>	2	1	4	7	8.53
<b>Total nail dystrophy</b>	3	4	1	8	9.75
<b>Transverse grooves (Beau's line)</b>	1	3	4	8	9.75
<b>Yellowish nail discoloration and Salmon patch</b>	3	1	3	7	8.53
<b>Total</b>	40	19	23	82	100

**Table 6: Nail changes in lichen planus (n=50).**

Nail changes	Finger nail	Toe nail	Both	Total	Percentage
<b>Thinning of nail plate</b>	2	1	2	5	10
<b>Longitudinal striations</b>	4	8	14	26	52
<b>Trachonychia</b>	2	1	2	5	10
<b>Longitudinal melanonychia</b>	1	1	1	3	6
<b>Pterygium</b>	1	2	1	4	8
<b>Dystrophy</b>	2	1	1	4	8
<b>Beau's line</b>	1	1	1	3	6
<b>Total</b>	20	15	15	50	100



**Figure 1: Multiple nail involvement with DLSO.**



**Figure 2: Multiple nail involvement with TDO.**



**Figure 3: Pitting, yellowish discoloration and onycholysis in psoriasis.**

The commonest pattern of nail change observed in psoriasis was pitting 25 cases (30.4%) followed by subungual hyperkeratosis 18 cases (21.9%), onycholysis 9 cases (10.9%), total nail dystrophy and transverse

grooves (Beau's line) 8 cases each (9.75%). The least common nail abnormality observed were splinter hemorrhage and yellowish nail discoloration and salmon patch, 7 cases each (8.53%) (Table 5). The most common nail involvement seen in lichen planus was longitudinal striae (ridging) 26 cases (52%) followed by thinning of nail plate and trachonychia 5 cases each (10%). The less common finding observed were nail pterygium, dystrophy and beau's line (Table 6).



**Figure 4: Longitudinal ridging, total dystrophy and pterygium formation in a case of LP.**

## DISCUSSION

In our study of 269 cases males dominated over females. The number of males were 161 (60%) and females were 108 (40%) with male to female ratio of 1.5:1. The most common age group affected was 31-40 years. This study was comparable to Puri et al in which males predominated over females, the most common age group affected was 21-40 years.<sup>3</sup>

Onychomycosis was the most common finding in 92 cases (34.2%) followed by psoriasis 82 cases (30.4%), lichen planus 50 cases (18.5%), eczema 11 cases (4%), trachonychia 9 cases (3.3%), paronychia 8 cases (2.9%), lichen striatus 6 cases (2.2%), vesicobullous disorders (pemphigus) 4 cases (1.4%), leprosy 4 cases (1.4%), PRP 2 cases (0.75%), Darier's disease 1 case (0.3%) were also noted. In similar study conducted by Puri et al.<sup>3</sup> Onychomycosis was the most common finding in (25%) followed by psoriasis (20%), lichen planus (5%), eczema (10%), trachonychia (4%), paronychia (8%), vesicobullous disorders (pemphigus) 1%), leprosy (2%), PRP 2 (1.4%), Darier's disease (4%) which is comparable to our study.

In the study performed by Grover et al, Sujatha et al and Garg et al, the occurrence of clinical pattern distal lateral subungual onychomycosis was highest which is similar to our observation in the present study.<sup>4-6</sup> They also observed that the most severe pattern of Onychomycosis

was second most common pattern unlike to our study as we reported in only 4.34%.

Sujatha et al, Garg et al, Grover observed superficial white onychomycosis in 2.86%, 1.11% and 2% respectively. Our study however shows a higher rate of SWO (5.4%).<sup>4-6</sup>

In psoriasis, majority of the patients were in the age group 41-50 years and it is comparable to the study done by Sharma et al.<sup>7</sup>

According to Ghosal et al, the involvement of fingernail was reported in 88.88% of cases and pitting (90%) was the most common fingernail change observed.<sup>8</sup> In the present study, involvement of fingernail was observed in 76.8% of cases and pitting (30.4%) was the most common change observed.

In lichen planus the age group commonly affected in our study was 31-40 years, which is comparable to studies by Singh and Kanvar et al.<sup>9</sup>

According to Tosti et al there is no significant difference in distribution of nail disorders between sexes, but in our study males dominated over female with male to female ratio of 1.7:1.<sup>10</sup>

Trachyonychia was observed in 9 cases (3.3%). These are associated with alopecia areata (2), psoriasis (2), lichen planus (2) and idiopathic (3). Taniguchi et al, Tosti A et al and Jerasututus S stated in their studies association of Trachyonychia with alopecia Areata, Lichen planus and Psoriasis and have suggested that the nail changes could possibly be caused by an autoimmune process.<sup>11-13</sup>

Paronychia was observed in 8 cases (2.9%). Mean age was 40.12 years. Esteves in his study reported that majority of cases of paronychia accrued in the age group 30-40 years which is similar to our study.<sup>14</sup>

Tosti et al and Morten et al have concluded that paronychia predominantly is a disease of domestic workers. In our study, 87.5% of cases were domestic workers.<sup>15,16</sup>

Vozza et al observed lichen striatus in children between 9 months and 15 years of age and is uncommon in adults, which is comparable to our study.<sup>17</sup>

The most frequent pattern of nail involvement observed by Shilpa et al was single finger nail change and most commonly affected was the thumb which is comparable to our study.<sup>18</sup>

## CONCLUSION

Nail changes form an indispensable part of various dermatological conditions. Its degree of involvement is well correlated with the disease severity. The pattern of

involvement is unique in each and every disease. Hence, one must be familiar with the terminology and classification of the nail disorders not only for establishing the diagnosis but also for the specific management of the disease. Hence examination of all the 20 nails is mandatory which can give a clue to make a diagnosis. In spite of the above credentials, nail changes are least discussed in the medical literature. This study conducted at R.D. Gardi Medical College and Hospital has highlighted the clinical importance of nail changes in various dermatoses beyond doubt.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

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**Cite this article as:** Kumar U, Varma K, Shayalwar A. Nail changes in various dermatoses: an observational study conducted at tertiary care center, Ujjain, Madhya Pradesh, India. *Int J Res Dermatol* 2020;6:237-42.