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Original Article

Nail manifestations in COVID recovered patients

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Abstract

Objective The study was conducted to describe the nail changes among COVID 19 infection recovered patients.

Methods The study was done at tertiary care center involving 90 patients who were recovered from COVID 19 infection. This was a cross sectional study conducted from July 2021 to June 2022 after obtaining institutional ethics committee clearance.

Results Out of 90 patients, about 58.8% of cases were in 21-30 age group, with equal proportion of males and females. Based on the post COVID duration, 44.4% of patients presented within 2 months. The nail findings were present in 47% of patients (31 cases) in mild infection, 63.6% (14 cases) of moderate infection and 100% of severe infection (3 cases), although p - value was insignificant (>0.05).

Conclusion The changes occurring in the nail depicts the severity of disease and also tell about the complications and sequel associated with the disease.

Key words
Nail; COVID 19; Pandemic.

Introduction

Nail is known as window to internal organs. Nail changes can be seen in one or more nails. Both specific and non-specific nail manifestations can be seen with the onset of systemic diseases as well as after the recovery.[1] Nail plate and nail unit abnormalities may be helpful as diagnostic tools or for confirmation of a systemic disease.

COVID 19 is the pandemic infection caused by virus Severe Acute Respiratory syndrome corona Virus 2 (SARS COV 2). In India, COVID 19 infection was mainly caused by kappa and delta variants. The disease manifestations vary from common flu to Severe respiratory distress along with cutaneous involvement and nail changes.[2] Though there are few case reports, not many studies have been done on nail changes and hence the current study was carried out to delineate nail changes in patients recovered with COVID 19 infection.

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Methods

This cross-sectional study was conducted at the McGann Hospital's outpatient department at the Department of Dermatology, Venereology, and Leprosy at the Shimoga Institute of Medical Sciences in Karnataka, India. The study included all cases who visited the hospital between July 2021 and June 2022 and were asked about their prior COVID illness, which had lasted from two weeks to six months. The exclusion criteria were the COVID recovered patients more than 6 months back and the patients with other severe

systemic illness. The changes in fingernails and toenails were recorded. The demographic information, disease status, duration, severity and treatment received were obtained.

Results

90 patients were included in the study, the maximum number of cases were found in 21-40 years age group accounting for 58.8% (53 cases) and least number of cases were found in <20 years age group accounting for 2.22% (2 cases) **(Figure 1)**. Male to female ratio was equal.

Based on post COVID duration, 40 patients were in 1-60 days group (44.44%) with 18 patients having nail findings, 32 patients in 61-120 days group (35.56%) with 19 patients showing nail changes and 18 patients in 121-180 days group (20%) with 10 patients showing nail findings. The p value was insignificant >0.05 **(Table 1)**.

Out of 90 patients, 86 patients were symptomatic and 4 patients were asymptomatic during infection. About 60% of cases were treated with only common drugs like azithromycin, doxycycline, ivermectin and vitamins and the rest were treated with combination of various drugs like intravenous anticoagulants, steroids, remidisivir injection, favipravir drug and O2 therapy. Based on severity of infection, the patients were divided into 3 grades- mild, moderate and severe. 65 patients (72.22%) had mild infection with 31 patients having nail changes and 34 patients with no nail changes. About 22 patients (24.44%) had moderate infection with 14 patients having nail changes and 8 patients having no nail changes. 3 patients had severe infection (3.33%) with all 3 having nail changes. The p value was insignificant >0.05 **[Table 2]**

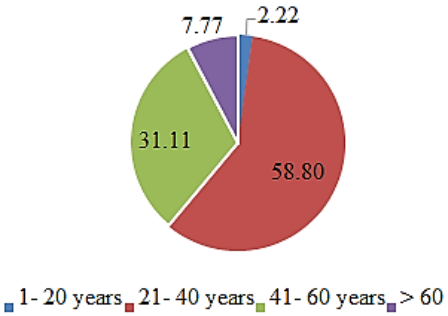

Figure 1 Age distribution of the study population.

Table 1 Post-COVID duration in the study population.

Post COVID duration(days)	*No of patients (%)*
1- 60	40 (44.44%)
61- 120	32 (35.56%)
121 - 180	18 (20%)
> 180	0

Table 2 Severity of infection with nail findings.

Severity	*Total no of patients*	*Nail findings*	
		Present	*Absent*
Mild	65	31	34
Moderate	22	14	8
Severe	3	3	0

Table 3 Nail findings in the study population.

Nail findings	*No of Patients(%)*
Nil	43 (47.78%)
Leuconychia	14 (15.5%)
Melanonychia	16 (17.78%)
Beau's lines	10 (11.11%)
Muerchke's lines	9 (10%)
Onychomadesis	1 (1.11%)
Terry nails	2 (2.22%)
Pitting	4 (4.44%)
Longitudinal ridges	11 (12.22%)
Loss of lustre	2 (2.22%)
Clubbing	2 (2.22%)

Upon examination of nails, 43 patients had no nail involvement (47.77%), 39 patients had involvement of fingernails only (43.33%), 2 patients had involvement of toenails only (2.22%), 6 patients had involvement of both finger and toe nails.

Based on various nail findings, 47 patients had nail changes accounting for 52.22% cases and 43 patients had nil changes accounting for about 47.77% of cases, depicted in **(Table 3)**.

Discussion

One of the organs most frequently impacted by

Figue 2 Beau's lines in right bigtoe.

Figure 3 Muerchke's band seen in left index, middle and ring finger.

Figure 4 Transverse leuconychia in right middle finger.

the SARS-CoV2 infection is the skin. There have been reports of a variety of symptoms, involving skin, mucous membranes, and hair.[3] Like the rest of the skin, nails may contain crucial information about the systemic nature of COVID-19 disease.[4] The pathogenesis of end organ damage and nail abnormalities is caused by thrombosis and vascular ischemia occurred in microvascular structures.[5,6]

Red half-moon sign, transverse orange discoloration and diffuse red white nail are novel and characteristic findings. These conditions are particularly related to potential microvascular damage that occurs during COVID 19 infection.[7] However these changes were not observed in our study possibly due to less numbers of patients with severe disease.

COVID nails have beau's lines which are transverse grooves in nail plate that result from transient disruption in growth of proximal nail matrix. Beau's lines are seen 1 to 3 months after the onset of systemic symptoms. These changes can also be seen in any severe systemic disease including COVID-19. Most of the patients in the present study had beau's lines and the distance of these lines from proximal nail fold reflects the timing of COVID-19 infection. The width and breadth of beau's lines also suggests severity of infection.[6,8,9] These changes were observed in case reports of Alobaida *et al.* and Ide *et al.*[8,10] **(Figure 2)**.

Apparent leuconychia occurs due to pathogenesis in nail bed vascularity and it can be caused due to any systemic illness.[11] Muerchke's bands or lines are double white transverse lines that appear as a result of pathology in vascular bed of nails. These bands are seen commonly in second, third and fourth finger nails.[12] Initially described in hepatic cirrhosis, Terry's nails occur as distal, thin, pink to brown transverse bands usually 0.5 to 3 mm width which does not get obscured. In Terry's nail, proximal part of the nail can be white or pale pink associated with or without the lunula.[13] These changes were noted in the study done by Ide *et al.* and Grover *et al.*[6,10]

Both Beau's lines and Leuconychia occur due to varying degree of insult to nail matrix **(Figures 3,4)**.

Onychomadesis was present in one of our patients, which is caused due to increased insult to nail matrix**.** This change was observed in the case report of Senturk and Ozdemir.[3]

Small punctuate or coarse depressions seen in nail plate is known as pitting. Pitting is seen various conditions but commonly and

Figure 5 Longitudinal ridges in right thumb.

Figure 6 Onychomadesis in both index, middle, ring finger and right little finger.

characteristically observed in psoriasis and alopecia areata.[14] Clubbing is described as increased curvature of nail plate in both vertical and horizontal direction. It results from the hypertrophy of soft tissue in digital pulp and nail bed area.[15] These changes were seen in our study.

Limitation Detailed study using onychoscope could not be done. The patients with severe disease could not be studied.

Conclusion

The changes occurring in the nail depict the systemic nature of COVID-19 infection and can predict further complications. Hence identifying the nail changes can predict the outcome of infection.

Declaration of patient consent The authors certify that they have obtained all appropriate patient consent.

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Conflict of interest Authors declared no conflict of interest.

Author's contribution

PC: Substantial contribution to study design, acquisition of data, manuscript writing, has given final approval of the version to be published.

PM: Substantial contribution to analysis and interpretation of data, critical review, has given final approval of the version to be published.

References

1. Singh G. Nails in systemic disease. *Indian J Dermatol Venereol Leprol*. 2011;**77**:646-651.
2. COVID-19 Weekly Epidemiological Update, Edition 43, Published 2021 Jun 08. [Last accessed on 2021 Jun 18]. Available from:https://reliefweb.int/sites/reliefweb.int/files/resources/20210608_Weekly_Epi_Update_43.pdf .
3. Senturk N, Ozdemir H. Onychomadesis following COVID-19 infection: Is there a relationship? *Dermatol Ther*. 2020;**33**:2–3.
4. Ocampo-Garza SS, Ocampo-Candiani J, Camela E, Vastarella M, Fabbrocini G, Scalvenzi M, Villani A. Nail changes as manifestation of systemic disease in COVID-19 infection. *J Eur Acad Dermatol Venereol*. 2021;**35(8)**:e474-e475.
5. Ladozhskaya-Gapeenko EE, Khrapov KN, Polushin YS, Shlyk IV, Vartanova IV, Fionik AM, Danilova DM. Evaluation of microcirculation disorders in patients with severe COVID-19 by nail bed capillaroscopy. *Messenger of Anesthesiology and Resuscitation*. 2021;**18(1)**:27-36.
6. Grover C, Saha S, Pandhi D. Nail Changes in COVID-19: A Cross Sectional Study From India. *Indian Dermatol Online J*. 2022;**13(3)**:326-33.
7. Hadeler E, Morrison BW, Tosti A. A review of nail findings associated with COVID-19 infection. *J Eur Acad Dermatol Venereol*. 2021;**35(11)**:e699-e709.
8. Alobaida S, Lam JM. Beau lines associated with COVID-19. *CMAJ*. 2020;**192(36)**: E1040.
9. Yaemsiri S, Hou N, Slining MM, He K. Growth rate of human fingernails and toenails in healthy American young adults. *J Eur Acad Dermatol Venereol*. 2010;**24**:420-3.

10. Ide S, Morioka S, Inada M, Ohmagari N. Beau's lines and leukonychia in a COVID-19 patient. *Intern Med*. 2020;**59((24)**:3259.
11. Holzberg M, Piraccini BM. Nail in systemic diseases. In: Baran R, deBerker D, Holzberg M, Piraccini BM, Richert B, Thomas L, editors. Baran &Dawber's Diseases of the Nails and their Management. 5th ed. Oxford, UK: John Wiley &Sons Ltd; 2019. pp. 481–573.
12. Meyerson MS, Scher RK. Nail signs of systemic disease. In: Callen JP, Jorizzo JL, Greer KE, Penneys NS, Piette WW, Zone JJ, editors. Dermatological signs of internal disease. 2 nd ed. Philadelphia: WB Saunders Co.; 1999. p. 368-75.
13. Holzberg M, Walker HK. Terry's nails:Revised definition and new correlations. *Lancet*. 1984;**1**:896-9.
14. Daniel CR, Sams WM, Scher RK. Nails in systemic disease. *Dermatol Clin*. 1985;**3**:167-87.
15. Goodman GJ, Nicolopoulos J, Howard A. Diseases of the generative nail apparatus. Part II: Nail bed. *Australas J Dermatol* 2002;**43**:157-70.