

Post- COVID Cutaneous Manifestations: A Retrospective Study at a Tertiary Care Centre

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Abstract

Introduction: COVID-19 disease is caused by SARS COV-2 virus. Though it primarily affects the lower respiratory tract, reports have indicated that specific cutaneous manifestations are associated with COVID-19.

Objectives: To evaluate the persistent dermatologic long term sequelae of SARS-CoV-2 infection, among recovered COVID-19 infected patients.

Methods: Baseline data were retrospectively collected from patient's medical records from the department of dermatology over 1 year (January 2021–January 2022), at a designated tertiary care centre. The demographic data, severity of COVID disease, and pre-existing cutaneous and systemic co-morbidities were noted. Dermatologic, hair and nail manifestations were recorded. The results were statistically analyzed.

Results: Record of total 972 patients were analyzed in our study, with 432 males and 340 females. Out of these, 88 cases (9.05%) had skin manifestations, of which 35 (39.77%) were male, and 53 (60.22%) were females. About 50% of cases experienced long term skin diseases after 6 months of the recovery. The majority, 47 (53.4%) of patients with skin manifestations, were in the age group of 30-50 years, followed by 31 (35.22 %) of patients in the 50 years age and above group. Urticaria and Pruritus were the most common manifestations 26 (29.5%), followed by telogen effluvium 24 (27.7%), herpes zoster 16(18.1%), pityriasis rosea, acneform eruptions, acral erythema, irritant contact dermatitis, palmar keratoderma, aphthous ulcer with lip crackling, eruptive pseudo angiomas, aquagenic keratoderma, and others.

Conclusion: Prevalence of cutaneous, hair and nail manifestations among COVID-19 patients was 88 (9.05%) in our study. More extensive research is required to establish our knowledge on the relation between skin and COVID-19.

Keywords: COVID-19, Skin, Cutaneous Manifestations.

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Introduction

World Health Organization (WHO) reported novel strain in the beta corona virus genus causing the severe acute respiratory syndrome on December 31, 2019. [1]

Many muco-cutaneous manifestations have been seen in coronavirus infection, as described in a European study. [2,3]

Functional receptors, Angiotensin-converting enzyme 2 (ACE2) for corona virus is expressed by alveolar cells and in the basal cell layer of the epidermis which may be responsible for the muco-cutaneous manifestation of COVID-19. [4,5]

Most of the of the patients usually recovers within 3–4 weeks of COVID-19 illness, but some patients continue to have long term systemic and muco-cutaneous manifestations. To the best of our knowledge, we are not able to find much literature about long term cutaneous, hair and nail sequelae in COVID-19 recovered cases. So, in this study, we reported various delayed cutaneous, hair and nail manifestations among recovered COVID-19 patients.

Materials and Methods

This was a retrospective study, carried out in our tertiary care hospital from January 2021 to January 2022. Any confirmed and recovered case of COVID-19 in our hospital, either hospitalized or outdoor patient. Suspected cases were excluded from the study.

This study was done after obtaining ethical clearance from the institutional ethics committee. Demographics like age, sex, skin, hair and nail manifestations, site of involvement, and associated symptoms were recorded in pre designed proforma and descriptive statistics were analyzed.

Long-term manifestations are defined as the presence of at least one skin, hair and nail problem diagnosed clinically that was

present at least 6 month after COVID-19 diagnosis or after discharge from the hospital, based on literature reports that COVID-19 infection course from an acute infection (2 weeks), post-acute hyper-inflammatory illness (4 weeks), and finally delayed manifestations. [6,7]

Results

A total of 972 COVID-19 recovered patients were included in the study, of which 532 (54.73%) were males and 440 (45.26%) were females. Among them, 337 (34.6%) patients were in the age group of 41 - 60 years, 107 (11 %) were above 60 years, 370 (38.06%) in 21 - 40 years, and 98 (10.08%) were below 20 years. The COVID disease severity was mild in 582 (59.87%) patients, moderate in 247 (25.41%), and severe in 53 (5.45%) patients. The mean duration of hospital stay among the study group was 6 days. Of these 972 recovered COVID patients, 88 cases (9.05%) had cutaneous manifestations; among them, 47 (53.4%) were males, and 41 (46.5%) were females. The majority, 47 (53.4%) of patients with skin manifestations, were in the age group of 30-50 years, followed by 31 (35.22 %) of patients in the 50 years age and above group. Short-term skin manifestations seen in 25 (28.4%) cases, intermediate-term skin manifestations in 26 (29.5%) and long-term skin manifestations in 37(42%) cases. Some of the short-term and intermediate-term cases developed long term skin manifestations.

The highest incidence of post covid mucocutaneous manifestations were seen in patients with moderate COVID disease severity. The most common skin manifestations reported were urticaria and pruritus, seen in 26 patients (29.5%) each. Four patients presented with lip and eyelid swelling. The next common manifestations were acute telogen effluvium 24 (27.7%), herpes zoster 16 (18.1%) and pityriasis rosea- like rash in

13 (14.7%) cases. Acneform eruptions and MASKNE were seen in 11(12.4%) and pityriasis versicolor in 9(10.2%) cases.

Mucosal lesions reported like herpes simplex in 3 (3.4%), oral apthae, lip crackling and oral dryness in 2 patients (2.2%) each. Palmar dermatosis reported like aquagenic acrokeratoderma, hand contact dermatitis, palmar erythema in 3 patients (3.4%) each and palmar hyperhidrosis and palmar keratoderma in 2 cases (2.2%).

Hair disorder like alopecia areata in 2 cases (2.2%) and prone position induced chest alopecia in 1 (1.1%) case. Nail changes also reported in form of brittle nails, beaus lines and melanonychia in 1 cases each.

Aggravation of the pre-existing dermatosis was seen in seborrheic dermatitis in 2 cases and psoriasis in one patient. Eruptive pseudo angiomatosis was seen in 7 (7.9%) cases. One patient presented with mucormycosis. (Table1)

Table 1: Cutaneous manifestations in post Covid-19 patients (Total case 972, skin dis 88, 9.05% prevalence)

Muco-cutaneous manifestations	Number of cases	Percentage (%)	Past history of disorder
Dermatologic manifestations			
Urticaria	26	29.5	No
Herpes zoster	16	18.1	No
Pityriasis rosea	13	14.7	No
Pityriasis versicolor	9	10.2	Yes
Acne aggravation /MASKNE	5	5.6	Yes
Acneform eruption	6	6.8	No
Folliculitis	4	4.5	No
Plantar keratoderma	2	2.2	No
Seborrheic dermatitis aggravation	2	2.2	Yes
Psoriasis aggravation	1	1.1	Yes
Eruptive pseudoangiomatosis	7	7.9	No
Aquagenic syringealacrokeratoderma (ASA)	3	3.4	No
Hand contact dermatitis	3	3.4	No
Palmar itch/Erythema	3	3.4	No
Palmar Hyperhidrosis	2	2.2	No
Mucosal manifestations			
Herpes labialis	4	4.5	Yes
Oral dryness	3	3.4	No
Oral apthae	2	2.2	No
Lip crackling	2	2.2	No
Hair manifestations			
Acute telogen Effluvium	24	27.7	No
Trichodynia	6	6.8	No
Prone position induced chest alopecia	1	1.1	No
Alopecia areata	2	2.2	No
Alopecia parvimaclata	1	1.1	No
Nail manifestations			
Melnonychia	1	1.1	No
Brittle nail/ beaus lines	2	2.2	No

- Many patients having combination of cutaneous, hair and nail manifestations

Discussion

Generally, COVID-19, have its deadly pulmonary and cardiovascular manifestations, but, muco-cutaneous involvement also impairs the quality of life of the cases.

While described course of acute disease, it is essential to establish the similar familiarity with long term manifestations to decide the necessary treatment and patient education strategy. Our patient population located in Hadoti region, displays elements of COVID-19 induced delayed muco-cutaneous sequelae.

Mostly patients noticed excessive hair loss in clumps within weeks to months after recovery, resulting in thinning of frontal hairline. Physical examination revealed non scarring hair loss, significant thinning, and positive hair-pull test. Apart from COVID-19 infection, the patients did not report any other disease, medications, or lifestyle modifications, of other causes of hair loss.

Telogen Effluvium (TE) is a self-limiting condition and proper reassurance and education is essential because it is physically and emotionally distressing for the recovering patient. [8,9] Moreover, its prevalence and severity was higher than that of hair loss of other acute viral diseases such as dengue (20%). [10] Trichodynia was associated with TE. It may be explained, that TE, trichodynia, and anosmia can evolve from the same neuropathology, which is supported by the expression of functional olfactory receptors (OR2AT4) in hair follicles. [11]

Few reports described an increase in herpes zoster (HZ) reactivation during the COVID-19 infection. [12] Aging, immunosuppression and the age group above 50 years in immunocompetent host, are the most common cause of HZ. Although, most of the cases of HZ in

COVID-19 patients occurred from two days to seven days but few cases have reported the delayed appearance of HZ following recovery of COVID-19. [13-15] It can be explained by decrease in total lymphocytes, a cluster of differentiation (CD4+) T cells, CD8+ T cells, B cells, natural killer (NK) cells and functional exhaustion of CD8+ T cells and NK cells with increased expression of natural killer cell receptor (NKG2A) resulting decreased antiviral immunity. [12, 16]

There are some sporadic reports of Pityriasis rosea (PR) and PR-like eruptions associated with COVID-19 [17] which could be related to an acquired state of immunodeficiency due to COVID-19 associated lymphopaenia. [18] HHV- 6/7 reactivation after immune dysregulation and COVID-19 virus itself may manifest PR as direct presentation of viral primoinfections. Pityriasis rosea-like rashes have been noted after H1N1 influenza, HPV, poliomyelitis, smallpox, hepatitis B vaccinations. [19] Above findings suggest that immune-induced viral reactivation may be the primary cause of PR.

Eruptive pseudoangiomatosis (EP) is characterized by sudden onset of erythematous blanchable papules with pale halo associated with any viral illness. These are seen more commonly in children but can be present in adult cases also. [20-22] EP could be induced by COVID-19 as paraviral or a classic viral eruption.

We have seen cases of seborrheic dermatitis exacerbation. COVID-19 associated lymphopenia, similar to human immunodeficiency virus (HIV) infection, increased inflammatory cytokines and neurogenic mechanisms may be the contributing factors. COVID-19 shows neurotropism, and neurological manifestations of COVID-19 have been described. [23] The role of neurogenic factors in relation to SD has been mentioned since patients with neurodegenerative conditions, such as

Alzheimer's disease or Parkinson's disease, have increased incidence of SD. Stellate ganglion block and decrease in Interleukin-6 production with improvement of SD, supports to this neurogenic hypothesis. [24]

Aquagenic syringeal acrokeratoderma (ASA) is a rare, acquired dermatosis which present with hypopigmented, translucent, flat-topped, oedematous papules and plaques that form hyperwrinkling or keratoderma, after water immersion and resolves when the hand dries. [25] Increased personal hygiene measures such as wearing personal protective equipment, excessive hand washing and increasing expression of vallinoid transient receptor type 1 (TVRT1) and selected aquaporins may play a role in the pathogenesis of ASA. [26,27] TVRT-1 receptor sensitivity increases with heat and electrolytes, so hyperosmolarity of sweat and increased water temperature results in increased Ca²⁺ influx and swelling of cells. [27,28]

Nails changes seen in our COVID-19 patients in form of beau lines or transverse grooves in the nail plate which can be caused by a temporary interruption of nail matrix growth. [29,30]

Severe COVID-19 cases were managed by the prone position for mortality benefit [31] which lead chest alopecia following ischemic injury to the dermis. [32] It is a self-limiting condition but can be mentally disturbing to the patient.

Maskne is a acronym of mask-related acne and describes a typical form of acne in the O-area due to the prolonged wearing of facial masks in COVID-19. [33] It encompasses both newly diagnosed as well as aggravated pre-existing acneiform eruptions. [34]

Cognizance of the importance of hand hygiene in preventing COVID-19 virus infection is high among general population but the panic has lead to increased use of soap & water and alcohol-based sanitizers than that is actually required which makes

them prone to develop hand eczema. We have come across such cases of hand contact dermatitis with palmar erythema and itching in our study also. [35]

Oral manifestations such as oral aphthae and dryness were found in few patients. The tropism of COVID-19 virus to the tongue and salivary gland epithelium explains that the oral mucous membrane may be the target of the virus.³⁵ Such interaction might disrupt the keratinocytes and lining of salivary glands manifesting clinically as oral aphthae. [26]

Conclusion

In conclusion, our study provides a detailed clinical data of the long term impact of this COVID-19 novel viral infection on skin, hair and nail and also presents postulations for likely underlying mechanisms involved with these changes. With disease duration, we have correlated these findings. Few previously unpublished skin manifestations of COVID-19, like chikungunya-like pigmentation, geographic tongue, alopecia parvimaclata and eruptive pseudoangiomatosis were also reported in our study. As the disease revolves, we need more analytical studies to understand the histopathological and correlating factors about the manifestations.

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