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Dermatological findings in SARS-CoV-2 positive patients: An observational study from North India

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Abstract

A novel coronavirus (severe acute respiratory syndrome corononavirus-2; SARS-CoV-2) has affected millions of people across the world. The coronavirus disease (COVID-19) resulting from SARS-CoV-2 manifests in variable clinical severity, featuring both respiratory and extra-respiratory symptoms. Dermatological manifestations of COVID-19 are sparsely reported. To study the various dermatological findings in SARS-CoV-2 positive patients in Indian population. Institutional ethical committee permission was sought and102 SARS-CoV-2 positive patients were included in the study. A thorough clinical examination was done to determine the nature and frequency of various dermatological manifestations in these patients. Out of the 102 positive cases, 95 were males. The mean age of the group was 39.30 years. Thirteen patients (12.7%) were found to have dermatological manifestations. Three (2.9%) had maculopapular rash, two (1.9%) had urticarial lesions and eight (7.8%) patients had itching without any specific cutaneous signs. Trunk was the most frequently affected area, followed by the extremities. No mucosal signs and symptoms were detected. Dermatological manifestations were seen in a small group of COVID-19 patients. The presentation may vary in different population groups and based on severity of disease.

KEYWORDS

COVID-19, SARS-CoV-2, skin, dermatology, cutaneous manifestation

1 | INTRODUCTION

The outbreak of novel coronavirus disease (COVID-19) in the Wuhan, Hubei province of China has now spread all across the world. The cluster of pneumonia cases resulting due to COVID-19 were found to be caused a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The clinical spectrum of SARS-CoV-2 infection appears to be wide, encompassing asymptomatic infection, mild upper respiratory tract illness, and severe viral pneumonia with respiratory failure and even death.[1-3] Besides the systemic manifestations, skin involvement has also been reported as a part of this viral infection.[4-6] Dermatological manifestations in COVID-19 can occur either as a direct implication of the SARS-CoV-2 or as a consequence of prolonged wearing of personal protective equipment (PPE).[4-8] The spectrum of dermatological manifestations owing to the disease process needs elaboration and data from various regions across the globe, involving different ethnicity, need to be processed. The present study elaborates various dermatological findings in SARS-CoV-2 positive patients from North India.

2 | MATERIAL AND METHODS

The study was approved by institutional ethical committee (IEC). The study was conducted for 3 weeks and all consecutive patients, who were found to be SARS-CoV-2 positive after RT-PCR test report (Nasopharyngeal swab) and admitted in the hospital, were enrolled for the study. Two authors, AD and VA, did a complete dermatological

evaluation for the patients according to their duty roster. Disease severity was assessed as per world health organization (WHO) definition and guidelines.[9] Only asymptomatic and mild/moderate disease patients were included in the study. Symptoms in mild disease were: fever >38°C, sore throat, cough, fatigue and headache, and symptoms in moderate disease included: fever, cough, dyspnoea, fast breathing, respiratory rate 15 to 30/min and SpO2 90% to 94%. Patients with severe-to-critical disease and admitted in the intensive care unit (ICU) were not included in the study, since complete dermatological evaluation was not possible. Clinical photography was not done due to lack of guidelines for clinical photography during COVID-19 and risk of transmission of SARS-CoV-2 through the device. Statistical analysis was done using IBM SPSS software, version 21. Numerical data were presented as number and SD (SD); and categorical data were presented as number and percentage. The level of significance, wherever applicable, was taken as $P < .05$.

3 | RESULTS

A total of 102 positive cases (95 males and 7 females) were included in the study. The mean age of the patients was 39.30 ± 17.9 years. Out of total 102 patients, 27 presented with mild/moderate symptoms. Among 102 patients, thirteen patients (12.7%) were found to have dermatological manifestations. Three (2.9%) had maculopapular rash, two (1.9%) had urticarial lesions and eight (7.8%) patients had itching without any specific cutaneous signs (Table 1). Trunk was the most frequently affected area, followed by the extremities. No palm/sole involvement; and mucosal signs and symptoms were detected. None of the patient had any pre-existing dermatoses. The evolution of maculopapular rash was on day 2 of fever in two patients and day 3 of fever in one patient. The maculopapular rash was centripetal in distribution. All patients, along with symptomatic treatment, were given tab hydroxychloroquine (HCQS) 400 mg twice daily on day 1, then 200 mg twice daily for 10 days. If patients showed fever, then after ECG evaluation, tab azithromycin 500 mg once a day for 5 days was added to the treatment. The presence of dermatological manifestations did not show any significant correlation between asymptomatic and mild/moderate cases ($P = .3213$). Five symptomatic and eight asymptomatic patients showed dermatological manifestations. The presence of maculopapular rash was only seen in symptomatic patients. Routine blood investigations did not show any significant alterations in parameters other than occasional leucocytosis.

4 | DISCUSSION

COVID-19 as a disease majorly affects pulmonary, cardiovascular, renal and other internal systems of the body. Cutaneous manifestations of COVID-19 were reported late in the course of this pandemic and still there is paucity of literature characterizing the dermatological presentations.[10] Available literature suggests that dermatological manifestations can occur either due to direct implication of the virus on the body or due to personal protective equipment (PPE). Some studies have also suggested the exacerbation of previous dermatoses during COVID-19. Atypical presentation of erythema multiforme has also been reported in COVID-19 patients.[11]

A study by Recalcati et al among 148 patients with COVID-19 showed skin involvement in 18 patients in the form of erythematous rash (14 patients), urticaria (3 patients) and chicken pox like vesicles (1 patient). Trunk was the most common site of involvement. Itching was either mild or absent. No correlation was found with these lesions and the disease's severity.[4]

Patients may present with an initial petechial rash, and later on develop respiratory distress and other symptoms for COVID-19.[5] Exacerbation of pre-existing skin condition such as rosacea, eczema, atopic dermatitis and neurodermatitis have also been observed in one report.[6] Drug reactions such as acute urticaria and urticarial vasculitis have been reported by Zheng et al owing to the increased use of potential anti-coronavirus drugs, Chinese herbs and other antibiotics.[6]

TABLE 1 Dermatological manifestations in SARS-CoV-2 positive patients

S. no	Age (years)	Sex	Dermatological finding	site
1	23	F	Maculopapular rash	Trunk, extremities
2	88	M	Maculopapular rash	Trunk
3	36	M	Maculopapular rash	Trunk
4	17	M	Urticaria	Trunk
5	36	M	Urticaria	Trunk
6	34	M	Pruritus	Generalized
7	21	M	Pruritus	Generalized
8	25	M	Pruritus	Trunk
9	26	M	Pruritus	Extremities
10	23	M	Pruritus	Trunk
11	30	M	Pruritus	Trunk
12	19	M	Pruritus	Trunk
13	55	M	Pruritus	Generalized

Recently, Casas et al have classified the cutaneous lesions of COVID-19 into maculopapular lesions (47%), urticarial lesions (19%), pseudo-chillblains or acral areas of erythema (19%), other vesicular eruptions (9%), and livedo or necrosis (6%).[12] The vesicular eruptions differ from varicella in being monomorphic and presents in early stage of infection. The pseudo-chilblain pattern, on the other hand, presents in late stages of infection. Acral erythema correlated with less severity of infection in their study. Other studies have also reported acral erythema or chilblain like lesions in COVID-19 patients.[12-14] and a state of hypercoagulability has been proposed behind this manifestation.[15,16] Kolivras et al demonstrated that histopathology in a chilblain like lesion shows papillary dermal edema and perivascular and peri-eccrine lymphocytic infiltration along with scatter necrotic keratinocytes in the superficial layers of epidermis.[17] This chilblain like presentation acts as a good prognostic factor in young individuals, whereas it is a bad prognostic factor in older individuals. The pathogenicity behind the development of chill blain lesions also differ owing to a differing immune response in both age groups. In younger age groups, chill blain like lesions occur as a consequence of immune response generating Type-1 interferons (IFN-I), but in older age group, the presentation is due to a delayed or insufficient IFN-I response.[17] COVID-19 patients showing acral ischemia like lesions tend to show elevated levels of D-dimer, fibrinogen and fibrinogen degradation product (FDP) and prolonged prothrombin time (PT).[18]

The histopathological changes in various cutaneous lesions of COVID-19 have also been studied.[16]Maculopapular rash in its early stage shows telengiectatic small blood vessels in upper dermis. As it progresses, Langerhans cells also shows up. Purpuric maculopapular rash shows perivascular lymphocytic infiltration with eosinophils and extravasated erythrocytes; and increased Langerhans cells. Severe macular hemorrhagic rash shows intravascular microthrombi in upper dermal vessels. Lesions mimicking Grover disease reveals dykeratosis, multinucleated giant cells and necrotic keratinocytes.[19]

The findings in our study included only maculopapular rash, urticarial lesions and nonspecific pruritus. None of our patients showed acral ischemia or chillblain like lesions, varicella like lesions, vesicular eruptions, livedo or necrosis. Different ethnicity, skin of color, differences in the infective strains of SARS-CoV-2 and inclusion of only mild-to-moderate disease in our patients may be the possible explanation. This study suggests that asymptomatic and mild-to-moderate disease may show nonspecific and subtle dermatological manifestations. Vasculopathy related skin lesions may be more specific for COVID-19 and may indicate severity.[20]

Our study has limitations in the form of lack of clinical photography, small sample size, exclusion of patients with severe-to-critical disease and lack of histopathological correlation.

5 | CONCLUSION

Dermatological manifestations in our study were shown by small number of patients. Mild-to-moderate disease may show nonspecific and subtle dermatological manifestations. The presentation and frequency of cutaneous manifestations in COVID-19 may vary in different population groups.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Ashish Dalal has made substantial contributions to conception and design, and acquisition of data, and analysis and interpretation of data; and been involved in drafting the manuscript and revising it critically for important intellectual content. Deepak Jakhar has made substantial contribution to conception and design; and been involved in drafting the manuscript and revising it critically for important intellectual content. Vishal Agarwal and Ravi Beniwal have made contribution in conception and design; acquisition of data, and analysis and interpretation of data; and drafting the manuscript.

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