

Cutaneous manifestations among COVID 19 patients admitted to a COVID hospital in South India

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Abstract

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

Aim: To identify the cutaneous manifestations present among COVID-19 infected patients. **Methods:** A descriptive study on patients with active COVID-19 disease at a designated district COVID hospital was conducted for two months from Sept 1 to Oct 31, 2020. The demographics, severity of COVID disease, and co-morbidities were noted. The cutaneous examination was done to record the type of rash, site, and symptoms of rash. The results were statistically analyzed. **Results:** 1065 patients were included in our study, with 626 males and 439 females. The COVID disease severity was mild in 88.08% of patients. 48 cases (4.51%) had skin manifestations, of which 52.08% were males, and 47.92% were females. The majority, 33.34% of patients with skin manifestations, were in the age group of over 60 years, followed by 31.25 % of patients in the 41 – 60 years age group. 89.58% of these patients developed skin rash after the appearance of COVID symptoms. 85.42% of patients with rash had mild COVID disease. The most common symptom was itching (70.83%). Urticaria and Pruritus were the most common manifestations (25%), followed by Vesiculopapular Rash, Acral Erythema, Maculopapular Rash, Irritant Contact Dermatitis, Aphthous Ulcer, Herpes Zoster, Purpura, and others. The most common site of rash was the abdomen (29.17%). **Conclusion:** Prevalence of cutaneous manifestations among COVID-19 patients was 4.51% in our study, but more extensive research is required to further our knowledge on the relation between skin and COVID-19.

Keywords: COVID-19, Skin, Cutaneous manifestations.

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Introduction

As the COVID-19 continues to change our daily lives in unimaginable ways, it also continues to pose challenges to all physicians, including dermatologists. COVID-19 disease is caused by SARS CoV-2 virus of the *Corona viridae* family. The first case was diagnosed in Wuhan, China, on Dec 30, 2019.[1] Later, WHO declared it as a global pandemic in march 2020. The transmission is known to occur through

contact, respiratory droplets, and aerosols. The incubation period for COVID-19 can be upto 2 weeks.[2] The primary target of SARS CoV-2 is the upper respiratory tract mucosa. Angiotensin-converting enzyme 2 (ACE2) expressed by type II alveolar cells acts as a functional receptor for the viral entry into host cells.[3,4] Hamming et al. demonstrated that ACE2 is present in the basal cell layer of the epidermis which might explain the cutaneous manifestation of COVID-19.[5] Patients present with various clinical manifestations like fever, dry cough, breathlessness, myalgia, fatigue, decreased leukocyte counts, and pneumonia with ground glass appearance on CT chest.[6] Though it primarily causes interstitial pneumonia and respiratory failure, recent reports from around the world have indicated that this novel

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coronavirus may be associated with specific cutaneous manifestations.

The initial studies from China reported low frequencies of skin disease in COVID-19 patients. Among 1099 confirmed cases in Wuhan, only 0.2% presented with cutaneous symptoms.[7] With a closer involvement of dermatologists in the battle against COVID-19, the interest in cutaneous signs of SARS CoV-2 infection has increased. In this study, we reported various cutaneous manifestations among COVID-19 patients.

Materials and Methods

This was a descriptive study on COVID-19 patients admitted in a designated district COVID hospital. This study was done from Sept 1 to Oct 31, 2020. Patients who tested positive by RT PCR and with active disease were included in the study. Suspected COVID patients and those already treated for COVID-19 were excluded from the study.

This study was done after obtaining ethical clearance from the institutional ethics committee. Informed consent was taken from the patients after explaining the nature and purpose of the study. The demographics like age, gender along with the type of skin rash, site of rash, and associated symptoms were collected. Associated co-morbidities and current medications were also noted. These findings were recorded on a computer database, and descriptive statistics were used to present the results.

Results

A total of 1065 patients with active COVID-19 infection were included in the study, of which 626 (58.78%) were males and 439 (41.22%) were females. Among them, 453 (42.53%) patients were in the age group of 41 - 60 years, 346 (32.48%) were above 60 years, 230 (21.6%) in 21 - 40 years, and 36 (3.38%) were below 20 years. The COVID disease severity was mild in 938 (88.08%) patients, moderate in 64 (6.01%), and severe in 63 (5.92%) patients. The mean duration of hospital stay among the study group was 10 days. Of these 1065 COVID patients, 48 cases (4.51%) had cutaneous manifestations; among them, 25 (52.08%) were males, and 23 (47.92%) were females. 16 (33.34%) patients with skin manifestation were in the age group of above 60 years, followed by 15 (31.25%) in 41 – 60 years, 12 (25%) in 21 – 40 years, and 5 patients (10.41%) below 20 years age group (Fig. 1). Out of the 48 cases, 43 (89.58%) developed skin rash after the appearance of COVID symptoms and 5 cases (10.42%) prior to onset of COVID disease. 4 (8.33%) patients with cutaneous manifestations had associated co-morbidities. The highest incidence of skin rash was seen among patients with moderate COVID disease severity (6.25%), followed by severe disease (4.76%), and mild disease (4.37%) (Table 1).

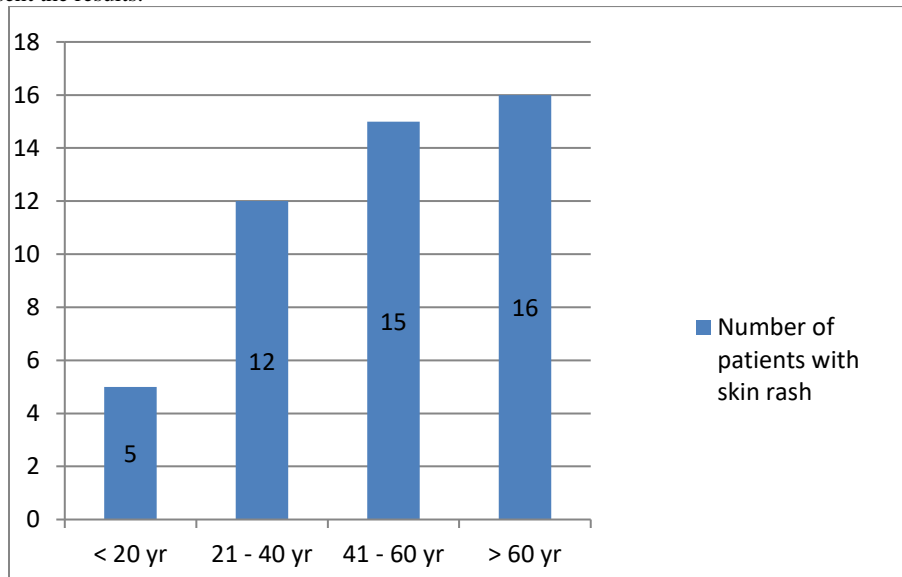


Fig.1: Bar diagram showing the Age group of patients with skin rash

Table 1: Table showing Disease severity in patients with skin rash

Disease severity	Skin rash		Total
	Yes	No	
Mild	41	897	938
Moderate	4	60	64
Severe	3	60	63
Total	48	1017	1065

Among patients with skin rash, itching was the most common symptom (70.83%), followed by burning sensation (8.3%). Two patients (4.7%) presented with dryness, one patient (2.08%) each with hair loss and pain over the rash. The most common skin manifestations reported were Urticaria and Pruritus, seen in 12 patients (25%) each. Among 12 patients with Urticaria, 2 patients presented with Angioedema. The next common manifestations were Vesiculopapular Rash, Acral Erythema, and Irritant Contact Dermatitis, in 3 patients (6.25%) each. Maculopapular Rash and Pityriasis Versicolor

were reported in 2 patients (4.17%) each. Pustular Rash, Purpura, Herpes Zoster, Oral Candidiasis, Erythrasma, Pityriasis Rosea, Tinea Corporis, Stasis Dermatitis, Aphthous ulcer, Telogen Effluvium, and Xerosis were reported in 1 patient (2.08%) each (Figure 2) (Table 2). The most common site of skin rash was the abdomen (29.17%). Other sites involved are upper limbs, lower limbs, face, palms and soles, lower back, chest, axilla, scalp, and neck. Resolution of skin rash was seen in 77% of patients by the time of discharge.



Fig. 2: Photographs showing (a) Pustular Rash and (b) Purpura

Table 2: Type of cutaneous manifestations in covid-19 patients

Skin diagnosis	No. of patients	%	Time of onset of Rash	Severity of Covid
Urticaria	12	25%	After Covid symptoms	Mild
Pruritus	12	25%	After Covid symptoms	Mild (11) Moderate (1)
Vesiculopapular Rash	3	6.25%	After Covid symptoms	Mild (2) Moderate (1)
Acral Erythema	3	6.25%	After Covid symptoms	Mild
Irritant Contact Dermatitis	3	6.25%	After Covid symptoms	Mild
Maculopapular Rash	2	4.17%	After Covid symptoms	Mild
Pityriasis Versicolor	2	4.17%	Before Covid symptoms	Mild
Pustular Rash	1	2.08%	After Covid symptoms	Moderate
Purpura	1	2.08%	After Covid symptoms	Severe
Herpes Zoster	1	2.08%	After Covid symptoms	Severe
Oral Candidiasis	1	2.08%	After Covid symptoms	Severe
Erythrasma	1	2.08%	Before Covid symptoms	Mild
Pityriasis Rosea	1	2.08%	After Covid symptoms	Mild
Tinea Corporis	1	2.08%	Before Covid symptoms	Mild
Stasis Dermatitis	1	2.08%	Before Covid symptoms	Moderate
Aphthous Ulcer	1	2.08%	After Covid symptoms	Mild
Telogen Effluvium	1	2.08%	After Covid symptoms	Mild
Xerosis	1	2.08%	After Covid symptoms	Mild

Discussion

Although cutaneous manifestations of COVID-19 disease are infrequent, it is of great importance for all clinicians to be aware of these presentations, as they may contribute to early and better diagnosis and management of the disease.[8] Diagnosing skin manifestations in COVID-19 patients remains a challenge because it is unclear whether the skin lesions are related to the virus. Initially, no skin manifestations were observed in COVID-19. The first case with skin rash was described in Thailand with petechiae mimicking dengue fever.[9]

The median age of the patients was 54 years in this study. In the studies done by Guan et al. and Galvan et al., the median age was 47 years and 49 years, respectively.[7,10] Whereas it was 27 years and 20 years in studies done by De Masson et al. and Fernandez et al. respectively.[11,12] Male to female ratio was 1.42:1 in this study. It was 1.38:1 and 1.16:1 in the studies done by Guan et al. and Fernandez et al. respectively, whereas in a study by Galvan et al. it was 1:2.[7,12,10]

In this study, the prevalence of skin manifestations was 4.51%. In the studies conducted by Guan et al. and Recalcati et al., the prevalence of skin manifestations was 0.2% and 20.4% respectively.[7,13]

Though there was no statistically significant association ($p=0.08$) between age and development of skin rash in this study, the skin rash was relatively more common among patients over 60 years of age. There was also no statistically significant ($p=0.33$) association between gender and the occurrence of skin rash.

Itching was the most common symptom reported in 70.83% of patients with skin rash in this study, followed by burning sensation in 20.83%. Similarly, itching was reported in 68% of patients and burning among 5.8% of patients in a study by Galvan et al.[10]

88.08% of patients had mild disease in this study. Similar findings (84.2%) were reported in the study by Guan et al.⁷ There was no statistically significant association ($p=0.77$) between the occurrence of cutaneous manifestations and severity of COVID in this study, similar to the study done by Recalcati et al.[13]

In various case series from around the world, a wide range of cutaneous manifestations in COVID-19 infected patients have been identified. Maculopapular Rash, Vesiculopapular Rash, Urticaria, Acral Erythema, Chilblain like lesions, Livedo, Purpura and Necrosis are some of the cutaneous manifestations identified.

The most common cutaneous manifestation was Urticaria seen in 25% of patients with skin rash in this study. In a study by Galvan et al. and Recalcati et al., Urticaria was reported in 19% and 16.7% of patients, respectively[10,13] whereas it was only 9% in a study done by De Masson et al.[11] Urticaria may be due to mast cell degranulation through complement activation and bradykinin release.[14] It may also be due to vasculitis caused by deposition of antigen-antibody complex in vessel wall.[15,16] Pruritus was seen in 25% of patients with skin rash in this study.

Acral Erythema was seen in 6.25% of patients with skin rash, whereas De Masson et al. and Galvan et al. reported Acral Erythema in 51% and 19% of patients in their studies

respectively.[11,10] Vesiculopapular Rash was seen in 6.25% of patients with skin rash in this study. Similar findings were reported in the studies done by Recalcati et al. (5.6%) and Galvan et al. (9%), Whereas it was 34.7% in the study by Sachadeva et al.[13,10,7] Irritant Contact Dermatitis was also reported in 6.25% of patients with skin rash in the present study.

The Maculopapular Rash was seen in 4.17% of patients with skin rash in this study, whereas it was seen among 47% of patients in the study by Galvan et al.[10] Sachadeva et al. and De Masson et al. reported Maculopapular Rash among 36.1% and 9% of patients in their studies respectively.[17,11]

Purpura (2.08%) was reported in one patient with advanced age and severe COVID disease. Galvan et al. reported Purpura in 6% of patients, whereas it was seen in 3% and 1.4% of patients in the studies conducted by De Masson et al. and Sachadeva et al. respectively.[10,11,17] According to Galvan et al., Purpura was significantly associated with advanced age and severe disease whereas Acral Erythema was associated with mild disease, which was similar to the findings in the present study.[10]

Pityriasis Rosea and Pustular Rash were seen in one patient each in this study. Sanchez et al reported one case of Pityriasis Rosea like skin eruption associated with COVID-19 infection.[18]

Herpes Zoster was seen in one elderly male in this study, whereas Galvan et al. reported 3 cases of Herpes Zoster in their study.[10] Pona et al. reported one case of COVID-19 patient with Herpes Zoster.[19] It may be a complication of decreased cell-mediated immunity associated with COVID disease. Other non-specific cutaneous manifestations seen in this study include two patients (4.17%) of Pityriasis Versicolor, one patient each of Oral Candidiasis, Aphthous Ulcer, Erythrasma, Tinea Corporis, Stasis Dermatitis, Telogen Effluvium, and Xerosis. Chilblain like lesions that have been reported in various studies were not reported in this study.

In this study, the abdomen was the most common site of rash (29.17%), followed by upper and lower extremities. Trunk was involved in 69.4% of patients, followed by hands and feet (19.4%) in a study by Sachadeva et al.[17]

In this study, 89.58% of patients developed skin rash in the active stage of the disease which subsided within a few days in most of them. Similarly, in a study by Hoda Rahimi et al., the skin lesions were observed in the active phase of infection (61% of cases) and subsided within a few days without any treatment.[8]

Conclusion

Prevalence of cutaneous manifestations among COVID-19 patients was 4.51% in this study. Although several cutaneous manifestations had been reported with COVID-19, more extensive research is required to further our knowledge on the relation between skin and COVID-19.

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