

## Original Research Article

# Dermatological manifestations in COVID-19 positive patients in a tertiary care center at Kanchipuram: an observational study

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### ABSTRACT

**Background:** Among the other systemic manifestations of COVID-19, cutaneous manifestations are also seen increasingly, but literature about those are significantly less. The skin manifestations in COVID are polymorphic according to studies. The aim of the study was to determine the cutaneous manifestations in COVID-19 positive patients at a tertiary care centre in Kanchipuram.

**Methods:** The ethics committee approved this study in our institution. The study period was 6 months (May 2020-October 2020) and those found to be SARS-CoV-2 positive after testing with RT-PCR test were enrolled.

**Results:** In 200 patients, 20 (10%) patients had dermatological manifestations, of which urticaria was present in 7 patients (35%), pruritus was present in 4 patients (20%), 2 (10%) had urticarial vasculitis, 3 (15%) had miliaria rubra, 2 (10%) had mask induced acne and 2 (10%) had maculopapular rash. The presence of dermatological manifestations did not show any significant association between asymptomatic and symptomatic cases.

**Conclusions:** COVID-19 positive patients asymptomatic or symptomatic with mild to moderate symptoms can have less dermatological manifestations.

**Keywords:** COVID-19, Cutaneous manifestations, Urticaria, SARS-CoV-2, Miliaria rubra, Urticarial vasculitis

### INTRODUCTION

In 2019 December, a new virus (SARS-CoV-2) originated in Wuhan, China which has now spread across the world due to its increased infective nature and long asymptomatic latency period.<sup>1</sup> There is a serious threat to the global public health due to coronavirus resulting in approximately more than 80000 new cases and 3000 deaths as of February 2020.<sup>2</sup> The suspicion of the viral disease is mainly based on the clinical signs (anosmia, ageusia, fever, fatigue, myalgia, dry cough, dyspnea and rhinorrhea), vital parameters like temperature, SpO<sub>2</sub>, pulse rate and radiological investigations. The swab used to isolate the virus was from nasopharynx and oropharynx to confirm the diagnosis.<sup>3</sup> Literature about

cutaneous manifestations are very less compared to other systemic manifestations in COVID-19. Though the virus is primarily known to cause pneumonia and respiratory distress and failure eventually, recent studies from all over the world has shown that this virus could cause dermatological manifestations too.

These cutaneous manifestations can be due to the direct implication of the virus or as a result of wearing personal protective equipment for a long duration. The distribution and frequency of dermatological manifestations pertaining to this disease need more explanation and data from different parts of the world.<sup>4</sup> This current study explains various cutaneous findings in COVID-19 positive patients in a tertiary care centre in Kanchipuram.

**Aim**

The aim of the study was to determine the cutaneous manifestations in COVID-19 positive patients at a tertiary care centre in Kanchipuram.

**METHODS**

This prospective observational study was conducted by the department of dermatology, venereology and leprosy at Meenakshi Medical College Hospital and Research Institute, Kanchipuram. This study was approved by the ethics committee in our institution, the study period was for 6 months (May 2020 to October 2020) and those found to be SARS-CoV-2 positive after testing with RT-PCR test using a nasopharyngeal and oropharyngeal swab sample, were admitted in the corona isolation ward. Mild disease individuals were characterized as those who had headache, sore throat, cough, myalgia and moderate disease were considered when they had SpO<sub>2</sub> 90%-94%, respiratory rate 15-30/min, dyspnoea, fever, cough, respiratory tract infection. And those patients who were asymptomatic but COVID positive were enrolled in the study and none of the patients had a pre-existing dermatosis. All age groups were included. Severe to critically ill patients who were admitted in the intensive care unit and pregnant women were not included in the study. No clinical images were taken because of the increased risk of infecting patients by introducing photographic devices and other such imaging devices which were not of keen importance or in hour of need were restricted in that area due to the lack of guidelines and increased rate of transmission of the virus through the device.

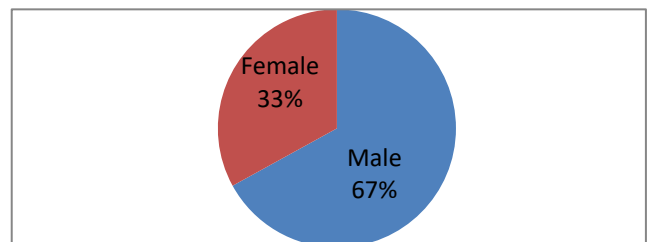
**RESULTS**

200 positive patients (134 male and 66 females) were enrolled in the study. Among 200 patients, 70 had mild to moderate symptoms and 130 were asymptomatic. Out of these, 20 (10%) were found to have dermatological manifestations. Among these 20, twelve were asymptomatic and eight were symptomatic. The mean age of the patients with dermatological manifestations was 42.18 years. The most common cutaneous manifestation of COVID-19 was found to be urticaria presenting in 7 people (35%), 4 patients (20%) had only pruritus without any dermatological manifestation, 2 (10%) had urticarial vasculitis, 3 (15%) had miliaria rubra, 2 (10%) had mask induced acne and 2 (10%) had maculopapular rash. The maculopapular rash was centripetal in distribution and evolved on the 3rd day of fever associated with loss of taste sensation for one patient and for another patient it started on 4th day of fever respectively and both of them had cough and severe myalgia and the rash subsided after a week for both of them. All the patients were treated symptomatically, if they had fever or respiratory symptoms tablet azithromycin 500 mg once a day was given for 5 days after a baseline ECG evaluation. Urticaria was seen

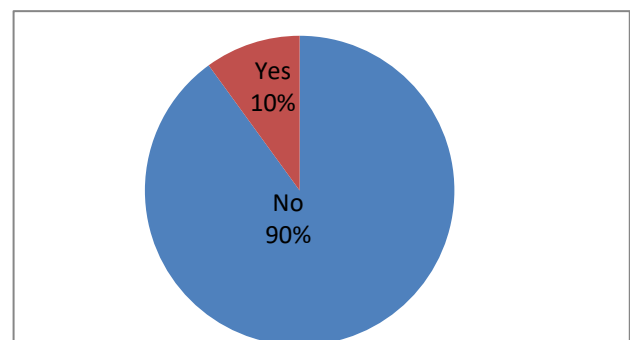
usually between 3-5 days, steroids and non-sedating antihistamines were given. Pruritus was managed by giving 2nd generation antihistamines it was seen from 4-5 days in symptomatic patients and subsided after a week. For those who had miliaria rubra associated with itching and mild burning sensation topical calamine lotion and antihistamines were given, it was seen after 10-15days of being positive and subsided after a week.

**Table 1: Dermatological manifestations with demographic pattern.**

Dermatological manifestations	Gender	Age (years)		
		21-30	31-40	41-50
Urticaria	Male	2	4	
	Female		1	
Pruritus	Male	2	2	
	Female			
Miliaria rubra	Male			1
	Female			2
Urticarial vasculitis	Female		1	1
Mask induced acne	Male	1		
	Female	1		
Maculopapular rash	Male	1		
	Female	1		



**Figure 1: Gender.**



**Figure 2: Dermatological manifestations.**

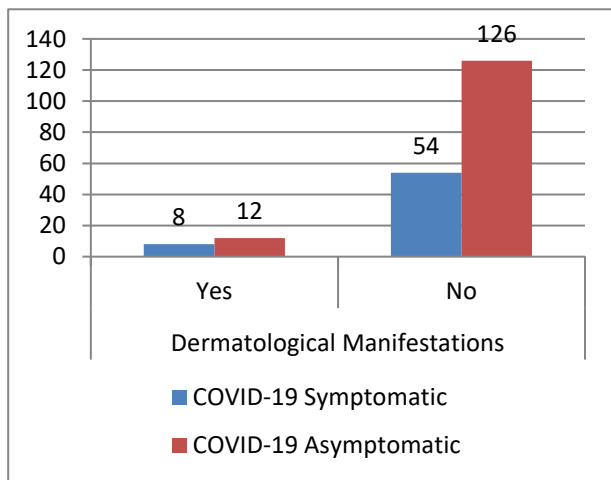
Urticarial vasculitis appeared after a week and started subsiding after 5 days of giving steroids. Routine blood investigations did not show any significant changes in laboratory levels but sometimes leukocytosis was seen in those who had maculopapular rash. In urticarial vasculitis patients CRP, ESR was elevated and mild increase in fibrinogen levels were seen. 4 out of 7 people who had urticaria had elevated serum IgE levels whereas other 3

did not show any significant changes in lab values except for occasional leukocytosis. For mask induced acne they were advised to use a clean cotton cloth mask and were advised to wear a surgical mask over it and were prescribed topical adapalene with clindamycin combination ointment. Out of 7, 5 (71.4%) patients (4 males, 1 female) with urticaria were in the age group between 31-40 years and 2 (28.6%) patients (males) were in the age group of 21- 30 years. Among the 4 (100%) patients who had pruritus all were males, of which 2 were between 21-30 years and 2 between 31-40 years. Urticarial vasculitis was present in 2 patients, all were males, 1 patient between 31-40 years and 1 between 41-50 years. 3 patients had miliaria rubra, 2 females and 1 male, all between 41-50 years. 2 patients had mask induced acne, 1 male and 1 female, both between 21-30 years. 2 patients had maculo-papular rash, 1 male and 1 female, both between 21-30 years. The presence of dermatological manifestations did not show any significant association between asymptomatic and symptomatic cases statistically (p value=0.359).

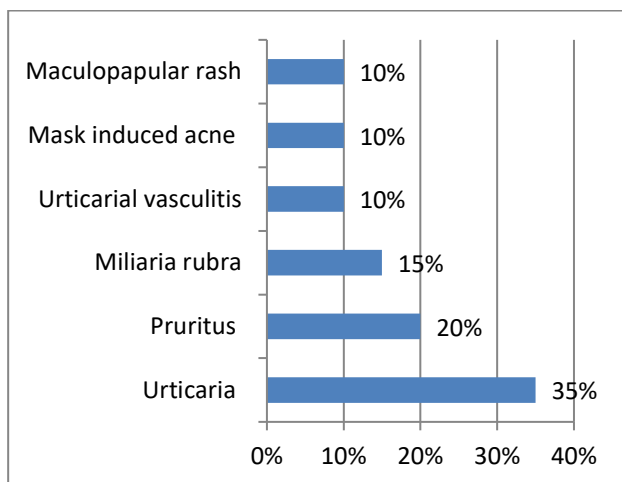
**DISCUSSION**

COVID-19 in a majority of cases affects the respiratory, cardiovascular and other systems of our body. Only in the later period of this pandemic, dermatological manifestations of COVID-19 were reported, and even now there is a paucity of articles characterizing the dermatological presentations.<sup>5</sup> Available studies show that cutaneous manifestations that occur are because of (a) direct implication of the virus particles in the body or (b) because of personal protective equipment (PPE). Few articles state that there can be worsening of pre-existing dermatoses in COVID-19. Rarely erythema multiforme has been reported in COVID-19 patients.<sup>6</sup> In our study, there weren't any atypical presentations. Recalcati et al did a study in a group with COVID-19 stated that skin was involved in 18 patients who showed an erythematous rash, urticaria and varicella like vesicles. The common site involved was the trunk, itching wasn't significant. But in our study, itching was not only present as a single entity (without any dermatological manifestations) in few of our patients, but it was also associated in those who had urticaria and maculopapular rash. Both in our study and this, there wasn't any correlation between the severity of the disease and the lesions.<sup>7</sup> There were few studies in which patients presented initially with petechial rashes and later developed respiratory distress and other symptoms of COVID-19.<sup>8</sup> But in our study, the lesions subsided after symptomatic treatment in a few days, and their hospital stay was uneventful. Pre-existing skin conditions showed exacerbation in one report. but none of our patients had any previous history of any cutaneous dermatosis. urticarial vasculitis and drug reactions have been reported by Zheng et al due to the exponential use of potent anti-coronavirus drugs, herbal medications and other antibiotics.<sup>9</sup>

Lately, Casas et al also did a study on the cutaneous lesions of COVID-19 and classified them into maculopapular lesions which was the most common manifestation in their study but in ours it was found only in 10% of our patients. Urticarial lesions were the most common manifestation in our study, but in theirs it was the second most common manifestation. The same percentage of urticarial lesions showed pseudo-chilblains or acral areas of erythema, but in ours, there were no cases of pseudo-chilblains reported, vesicular eruptions were not found in our patients, but in theirs, 9% of their patients had, and livedo or necrosis were also present in few people in their study.<sup>10</sup> The vesicular eruptions in their study were not like as seen in varicella, it was monomorphic and presented in the initial stages of the disease. In their study, Acral erythema was correlated with less severity of the infection. However, this is a study among the patients with less severity of the disease still did not present with acral erythema. Other literature delineates acral erythema or chilblain like lesions in COVID-19 patients due to hypercoagulability.<sup>10-13</sup>



**Figure 3: Dermatological manifestations of COVID-19 patients.**



**Figure 4: Dermatological manifestation.**

Galvan et al tried to categorize the cutaneous lesions with the severity of the disease. their study found that less severe disease showed pseudo-chilblain and in severe form livedoid presentations were seen whereas in this study, pseudo-chilblains were not seen.<sup>17</sup> In the study by Duramaz et al from Turkey showed that 15% of the young aged people were affected. Among mild symptomatic adolescents and children, a study showed chilblain-like lesions, whereas in our study children were not affected. Kolivras et al revealed that histopathology of a chilblain like lesion showed papillary dermal oedema and perivascular and peri-eccrine lymphocytic infiltration along with scattering necrotic keratinocytes in the superficial layers of the epidermis.<sup>14</sup> 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 in the origin of chill blain like lesions differs due to immune response alterations in both young and older age groups. In younger aged individuals chill blain like lesions were as a result of immune response generating type-1 interferons (IFN-I), but in older age group, they found it was due to a delayed or insufficient IFN-I response.<sup>14</sup> In another journal COVID-19 patients who showed acral ischemia like lesions showed elevated levels of D-dimer, fibrinogen and fibrinogen degradation product (FDP) and prolonged prothrombin time (PT).<sup>15</sup>

Two of our patients with urticarial vasculitis showed an increase in CRP, ESR and fibrinogen levels were mildly elevated. The findings in our study included only maculopapular rash, urticarial lesions, urticarial vasculitis, nonspecific pruritus, miliaria rubra and mask induced acne. None of our patients showed acral ischemia or chilblains like lesions, livedo or necrosis. 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.<sup>16</sup>

### Limitations

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

### CONCLUSION

To conclude, COVID-19 positive patients asymptomatic or symptomatic with mild to moderate symptoms can have minimal dermatological manifestations. Cutaneous features in our study were depicted by a small group of patients. It is very important that all the healthcare providers should be well versed in these increasingly common cutaneous manifestations of COVID-19.

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

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