

# Urticarial rash as the initial presentation of COVID-19 infection: a case report

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## Abstract

During the COVID-19 pandemic, multiple skin manifestations have been described. These include an urticarial rash, morbilliform rash, maculopapular rash, vascular lesions, and varicella-like eruptions. A 30-year-old woman presented with a mild cough, then hives and pruritic rash for 3 days, followed by fever, dyspepsia, and throat pain for one day.

## Urticarial rash as the initial presentation of COVID-19 infection: a case report

Short title: Urticarial rash & COVID-19

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## ABSTRACT

During the COVID-19 pandemic, multiple skin manifestations have been described. These include an urticarial rash, morbilliform rash, maculopapular rash, vascular lesions, and varicella-like eruptions. A 30-year-old woman presented with a mild cough, then hives and pruritic rash for 3 days, followed by fever, dyspepsia, and throat pain for one day.

## Key Clinical Message

The occurrence of cutaneous signs in COVID-19 is associated with disease severity, although there is inadequate evidence to assess skin manifestations' prognostic relevance. Skin manifestations are often self-limiting and last six to eight days, although they may persist up to 10 days.

*Keywords: COVID-19; Urticarial rashes; Skin; SARS-CoV-2; Dermatology*

## INTRODUCTION

The *SARS-CoV-2* (COVID-19) pandemic impacted around 472 million people and killed around 6.09 million patients (1). Although the virus is largely responsible for respiratory symptoms, a growing number of dermatological signs and symptoms of this illness have been identified. Several reports worldwide have identified a range of potential skin manifestations of *SARS-CoV-2* (COVID-19) (2-8). However, the frequency of dermatological presentation (between 0.2% to 29%) and also the timing of skin manifestations are difficult to ascertain (9-11).

Here we have a case report of a young woman who initially presented with a generalized pruritic urticarial rash ranging from one to seven centimeters in diameter on the 6th of January 2022.

## CASE PRESENTATION

A 30 years old lady with no co-morbidities and no significant past medical history. She received her third booster dose of mRNA-1273 COVID-19 vaccine 5 days before presenting with symptoms.

The initial symptom was a mild dry cough. On the second day, she developed a pruritic, erythematous macular rash on the back of her neck and the volar aspect of her forearms. She did not self-medicate with over-the-counter (OTC) medications and sought medical attention on an outpatient basis. On evaluation, she was found to be COVID-19 Antigen positive and was prescribed antihistamines.

On the fourth day of symptoms, she presented to the ED (emergency department) with a worsening pruritic rash which had spread to involve her neck, face, arms, trunk, and legs (Figures 1-3) and mild fever, and dyspnea.

She did not have shortness of breath, stridor, wheeze, chest pain, or abdominal pain. She had no history of insect bites, exposure to new foods, recent use of any medications, over-the-counter medications, herbal supplements, and no known disease exposures. The patient denied any past history of similar rashes or allergic reactions and also denied any family history of the similar condition or skin diseases running in her family.

### *Clinical Examination*

On examination: The following were the vital signs: On room air, the temp 37.9°C, the blood pressure (BP) 114/72 mmHg, the respiratory rate 20 b/m, the heart rate 85 b/m, and the O<sub>2</sub> Sat was 99 percent.

She had widespread raised erythematous and pruritic lesions on her face, trunk, bilateral upper and lower extremities consistent with an urticarial rash (Figures 1-3). In addition, she had substantial pain as a result of pruritus and a burning-like feeling in the lesions. The remaining clinical examination, including the respiratory system, was also unremarkable.

COVID-19 PCR test was positive, Chest X-ray was unremarkable, and EKG revealed sinus tachycardia only. The other laboratory investigations (see Table 1).

### *Differential Diagnosis*

Several etiologies are considered, such as COVID vaccine-induced, mast cell defects, food-related allergies, autoimmune conditions, and infectious causes. Because the urticarial rash appeared shortly before her positive PCR test and she had accompanying moderate viral symptoms, the urticaria is thought to be a presenting sign of her COVID-19 infection. A detailed history was taken and did not reveal any concern for new exposure to food, use of over-the-counter medications, recent use of any kind of medications or herbal supplements, as well as no history of a similar attack; and it was unlikely to be an anaphylactic reaction as it was progressive worsening over 3 days duration, other suspected infection were excluded after screening and cultures. After being diagnosed with COVID-19, a trial of observation with antihistamines was felt.

### *Management & Follow-up*

As infective causes were being considered, antibiotic coverage with Ceftriaxone 2 gram and azithromycin 500 milligram once daily were started on admission. It was discontinued on the third day when preliminary blood

culture reports came back negative. Steroids (hydrocortisone IV one dose 200-milligram and then transitioned to oral prednisolone 20 milligrams which was given for 4 days) and antihistamines (diphenhydramine 25-milligram injection on need along with oral fexofenadine 180 milligrams which was given daily for 5 days then it was replaced with levocetirizine 5-milligram daily dose) and emollient creams were given throughout the hospital stay for the allergic symptoms. Deep Venous Thrombosis prophylaxis was provided with enoxaparin 40-milligram subcutaneous injection daily. Oral esomeprazole 20-milligram was given for stress ulcer prophylaxis. She was discharged on levocetirizine 5-milligram and esomeprazole 20-milligram once daily for 5 days. She had an apparent improvement of rash after 2 days, with a remaining mild itching and burning sensation. She was discharged home safely on day 6 of hospitalization after all her workup was done, which ruled out other suspected causes of her rashes.

## **DISCUSSION**

Coronavirus disease (COVID-19) is caused by the severe acute respiratory syndrome coronavirus 2 virus; which is a Ribonucleic acid (RNA) virus that invades host cells through one receptor called angiotensin-converting enzyme 2 (ACE2) receptor (12, 13) which is found on small intestine enterocytes, epithelial cells of the lung alveolar, heart, also the endocrine, and neurologic systems (10). Multiple cutaneous symptoms have been seen and documented in people infected with COVID-19. Furthermore, the presence of skin symptoms in COVID-19 has been observed to vary between 0.2 - 29 percent (11); These include an urticarial rash, Morbilliform rash, maculopapular rash, livedo reticularis/racemosa-like pattern, vascular lesions, varicella-like eruptions

The pathogenesis of COVID-19 urticaria is largely underdiagnosed. Still, it might be mediated by the acute systemic inflammatory response to the COVID-19 to acute infection, which results in mast cell activation and the production of pro-inflammatory cytokines (14).

Skin manifestations associated with COVID-19 are often self-limiting and do not lead to complications, and usually, the urticarial rash lasts around Six to eight days and up to ten days (2, 15). Urticarial rashes are mostly noted to occur simultaneously or after the onset of non-cutaneous symptoms. The presence of skin and dermatological symptoms in COVID-19 has been linked to disease severity; a Spanish research linked the characteristics of maculopapular or urticarial lesions to the severity of COVID-19 infection (2); on the other hand, in their literature study of twenty-one patients, Sachdeva et al. claimed that there is an implausible link between cutaneous lesions and COVID-19 infection severity (15).

Most of the patients achieved adequate symptom control with the use of antihistamines treatment only, which can be used until they get resolution (14). Regarding glucocorticoids use, it may be considered short-term additive therapy for severe symptoms refractory to 1 or more antihistamines at maximum doses (16).

## **CONCLUSION**

While the common COVID-19 infection presentation is respiratory symptoms, physicians should not ignore other uncommon presentations like dermatological findings and cutaneous manifestation, which are increasingly being seen. Therefore, the management of urticaria is focused on controlling symptoms and typically includes parenteral and oral antihistamines and oral corticosteroids.

### **Declarations**

#### **Ethics approval and consent to participate**

The article describes a case report. Therefore, no additional permission from our Ethics Committee was required.

#### **Consent for publication**

The consent for publication was obtained from the patient.

#### **Availability of data and material**

All data generated or analyzed during this study are included in this published article.

### **Competing interests**

The authors declare that they have no competing interests.

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### **Authors' contributions**

UA, SU, AJN: Data Collection, Literature Search, Manuscript Preparation

All authors read and approved the final manuscript

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### **Figure and Table Legends**

Table 1. Laboratory investigations

Figure 1. (Urticarial rash on the left hand)

Figure 2. (Urticarial rash on the right hand)

Figure 3. (Diffuse urticarial rash on the left upper extremity)

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Lab Tests	Results	Normal values
White cell count	12×10 <sup>9</sup> cells/L	4–10×10 <sup>9</sup> cells/L
Red cell count	5.2 x10 <sup>6</sup> /uL	3.8-4.8 x10 <sup>6</sup> /uL
Platelet	367 x10 <sup>3</sup> /uL	150-400 x10 <sup>3</sup> /uL
C reactive protein	129 mg/L	<8.0 mg/L
Serum creatinine	61 umol/L	44-80 umol/L
Serum Ferritin	308.0 ug/L	12-160 ug/L
Urea	3.0 mmol/L	2.5-7.8 mmol/L
Sodium	137	135-145 mmol/L
Potassium	3.7	3.5-5.3 mmol/L
Bilirubin	27 umol/L	0-21 umol/L
Alanine Aminotransferase	63 U/L	0-33 U/L
Aspartate Aminotransferase	71 U/L	0-32 U/L
Procalcitonin	0.15 ng/mL	<0.5 ng/mL
Interleukin-6	74 pg/mL	<7 pg/mL

Table 1. Laboratory investigations

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