

Cutaneous Manifestations in Patients with Covid-19: A Prospective Clinical Analysis

Sagar Mani Jha¹, Nabin BhaktaShakya¹, Anil Kumar Singh Dangol¹, Sunil Shakya¹, JyotshnaYadav¹, Manisha Maharjan¹, Shrikant Panday¹

¹Department of Dermatology and STI, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

Abstract

Introduction: The COVID-19 pandemic has become a major health care issue worldwide. The surge in cases was seen in the second wave, with more people getting hospital admissions. An accurate and rapid identification of cutaneous manifestations is vital to early diagnosis and better prognosis. The aim of the study was to determine cutaneous manifestations in patients with COVID-19.

Materials and Methods: This prospective observational cross-sectional hospital-based study was conducted from June 2021 to September 2021. Patients admitted to the hospital were examined by the dermatologists. All inpatients diagnosed with COVID-19 with RT PCR were included. Types, patterns and how the skin lesions changed its course during illness were recorded. Ethical clearance was taken from IRC. Statistical analysis was done with SPSS Version 20.0.

Results: A total of 452 COVID-19 RT-PCR-positive patients were enrolled out of which 97(21.5%) had skin lesions. Out of 131 comorbid patients, 40(30.5%) had skin lesions. Urticarial wheals and erythema nodosum were seen in 21(4.6%) each and were the most common manifestation, followed by exanthema in 17(3.8%).

Conclusion: Study showed maximum patients with COVID-19 had urticaria and erythema nodosum. It is important to know the types of skin lesions for early diagnosis. In order to prevent the spread patient can be sent for investigations on time. More elaborate studies with multicenter involvement are recommended.

Key words: Erythema nodosum; Pandemic; Skin lesions; Urticaria

Introduction

Pandemic of COVID-19 has become a major health care issue worldwide caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is a big public health issue due to which people suffer from various types of acute illness, complications, and death. It has come as a big economic and social burden to any country. In this hospital, the surge in cases has been seen in the second wave, with more people getting hospital admissions as compared to the first wave. Even though it mainly affects the respiratory system, it has been found to have its manifestations in other systems as well. Other than symptomatic patients, virus of COVID-19 spreads silently through asymptomatic carriers as well. An accurate and rapid identification of cutaneous manifestations may be vital to early

diagnosis and lead to a possible better prognosis in COVID-19 patients.¹

The time taken by real time reverse transcriptase polymerase chain reaction (RT-PCR) and the cost of performing it is a big burden to health care system of any country. However, if a typical clinical pattern of skin lesions is demonstrated then it would help clinicians to make the diagnosis as early as possible and send patients for further investigations and management. In the studies conducted, evidence is accumulating that skin manifestations associated

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Corresponding Author:

Dr Sagar Mani Jha

Department of Dermatology and STI, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

ORCID ID:0000-0002-3747-9882

Email: sagarmanijha@gmail.com

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with COVID-19 are extremely polymorphic.² Genovese et al., have classified COVID-19 related skin lesions into (i) urticarial rash, (ii) confluent erythematous/maculopapular/ morbilliform rash, (iii) papulovesicular exanthem, (iv) chilblain-like acral pattern, (v) livedoreticularis/racemosa-like pattern, (vi) purpuric “vasculitic” pattern.³

In spite of the continued increase in the prevalence of COVID-19 in various parts of country, relatively little epidemiological research has been carried out on the pattern of skin manifestations in Nepal. In this study, we attempted to determine the varieties of skin lesions for whom dermatology consultation was taken. This study gives an insight about early diagnosis of COVID-19 on the basis of pattern of skin lesions and also gives a clue if COVID-19 has a specific pattern of skin lesions or not. The aim of the study was to determine the cutaneous manifestations in patients with COVID-19.

Materials and Methods

This study was a prospective observational cross-sectional hospital-based study. The study was carried out on inpatients diagnosed with COVID-19 with RT PCR from June 2021 to September 2021 in Shree Birendra Hospital, Nepalese Army Institute of Health Sciences. These patients were examined for mucocutaneous lesions and the data were recorded. Gender, age, types of skin lesions, symptoms, onset of the lesions and evolution of the lesions were recorded. Age group was divided as children (0-14 years), youths (15-24 years), adults (25-64 years) and seniors or old age (65 years and above).⁴ Types of skin lesions which includes primary lesions such as papules, macules, vesicles, bullae, plaques, nodules, pustules, wheals, abscess; secondary lesions which includes fissure, scales, crusts, excoriations, erosions, scar, sinus, atrophy or special lesion which includes comedones, milia, telangiectasia were recorded in detail and photographic evidence were taken. Pattern of skin lesions, size, shape, symmetry, colour, surface, distribution and arrangement of the lesions were also recorded in detail.

Patients admitted to the hospital were examined by the dermatologists. As all the specialists of Shree Birendra Hospital, irrespective of their departments, had rotational duties for the COVID-19 inpatients during pandemic, the dermatologists examined these COVID-19 patients during their respective duties. All the safety measures for the doctors were taken as per the guidelines and the rules of the hospital, which included use of personal protective equipment. The consent of the patients was taken by the dermatologists during their COVID-19 duties in the prescribed format given by Institution Review Committee (IRC). Ethical clearance was taken from IRC (Ref.no.245, reg. no. 428).

Statistical analysis of data was done with SPSS (Statistical Package of Social Sciences) Version 20.0. The descriptive statistical analysis of the study was

expressed in frequency and percentage. Chi-Square test was applied to determine the significance of variables.

Results

A total of 452 COVID-19 RT-PCR-positive patients were enrolled for the study. Out of these people, 4 (0.9%) were children; 60 (13.3%) were youths; 122 (27%) were middle-aged, and 266 (58.8%) were senior or old age patients. Three hundred eight (68.8%) were males and 144 (31.9%) were females. Out of total participants, 97 (21.5%) had skin lesions.

A total of 131 (29%) patients suffered from either one or more than one comorbid condition. These illnesses included hypertension in 86 (19%) patients; diabetes mellitus in 43 (9.5%) and chronic obstructive pulmonary disease in 12 (2.7%). Other comorbidities included chronic kidney disease, cancer, hypothyroidism, and obesity with dyslipidemia. Out of 131 comorbid patients 40 (30.5%) had skin lesions and out of 321 patients who didn't suffer from any other systemic disease 57 (17.7%) had skin lesions, p value 0.002 with odds ratio 2.03 (1.27-3.25, CI 95%).

Among all COVID-19 patients who had skin lesions, urticarial wheals and erythema nodosum were most common (Table 1). The lesions of erythema nodosum developed in all the patients on 2nd or 3rd day of fever and resolved as the fever subsided. In 9 (56.2%) old age group patients, chilblain-like lesions were seen. In all patients with xerosis, severe scaling was noted which resolved as the other symptoms of COVID-19 resolved. In the patient with malar rash, no symptoms of any connective tissue disorder were seen and it resolved with application of mild steroid within a week.

Table 1: Cutaneous manifestations in COVID-19 patients

Skin manifestations	Number (Percentage)
N=452	
Urticaria/wheals	21 (4.6%)
Erythema nodosum/ Sub cutaneous tender nodules	21 (4.6%)
Generalized exanthema	17 (3.8%)
Chilblain like lesions	16 (3.5%)
Apthous ulcer	8 (1.8%)
Purpura	5 (1.1%)
Xerosis with severe scaling	5 (1.1%)
Malar rash	2 (0.4%)
Raynaud's phenomenon	1 (0.2%)
Prurigo nodularis	1 (0.2%)

Discussion

This study was carried out during the peak of second surge of COVID-19 in Nepal and we evaluated the types of skin lesions of patients who suffered with this disease. Out of 452 patients, 97(21.5%) developed skin lesions during their COVID-19 illness. The first report mentioning skin lesions in COVID-19 patients was published by Guan et al in China in 2020, which showed skin rash in 0.2% patients.⁵ However, this study didn't mention the type of skin lesions or its pattern of distribution. In a study done in Italy, cutaneous manifestations were found in 20.4% of the patients out of 88 people studied.⁶

Different types of skin lesions were noted in our study. Urticarial rashes predominantly comprised of wheals which were seen on the trunk and it appeared during the onset of fever and resolved rapidly as the symptoms of COVID-19 subsided. Urticaria was one of the most common presentations in our study. Similarly a study in Spain showed that the cutaneous manifestations, such as erythematous rash, localized or widespread urticaria, seem to be the most common manifestations in acute severe cases.⁷ All together 7 cases of various types of urticaria was reported in a case series in Nepal.⁸ Urticaria and angioedema can be triggered by viral and bacterial infections, such as cytomegalovirus, herpes virus, and Epstein-Barr virus and mycoplasma.⁹ Exanthematous or maculopapular lesions were seen in 3.8% of patients whereas in a cohort by Galván Casas et al., 47% of all cutaneous manifestations were of this type.¹⁰ These lesions appeared with the onset of fever and resolved as the fever subsided.

Patients having erythema nodosum had tender nodules predominantly on the shins bilaterally, forearms, dorsum of hands and feet. Typically, these lesions developed on the 2nd or 3rd day of fever and resolved once steroid was started in these patients. Sipfle et al., reported a case of erythema nodosum like lesions in a patient who was tested positive for COVID-19 three days prior to rash.¹¹

Many studies have shown chilblain-like lesions to be specific to COVID-19.³ In this study chilblain like lesions were seen in 3.5% of patients and mainly in elderly, which was characterized by erythema, edema with few erosions and tenderness on hands and feet. Tosti et al., reported that most of the chilblain like lesions were seen in the feet of patients.¹² Endothelial damage, obliterative microangiopathy, and coagulation abnormalities may be attributed to the pathogenesis

of these lesions.¹³ The milder forms of COVID-19-associated chilblain-like lesions may have association with type I interferon (INF).¹³ Skin lesions were seen in 30.5% of comorbid patients and symptoms were often severe as compared to other non-comorbid patients. Old age and comorbid patients with compromised immune systems, would generate a delayed type I IFN response which leads to the release of cytokines, macrophage activation syndrome, elevated ferritin and D-dimer levels, true acro-ischemic lesions and may have poor prognosis.¹⁴

Purpura was seen in 1.1% of the patients in this study. Purpura was seen in 1.1% of the patients in this study. Purpuric lesions are seen frequently in elderly patients with severe COVID-19 and this may be linked to the cutaneous manifestations associated with the high rate of COVID-19-related mortality.³ All the 5 patients who had purpura were having severe COVID-19 symptoms and were getting treatment in intensive care unit of the hospital. Purpura may be due to direct damage to the endothelial cells by a virus or dysregulated host inflammatory responses induced by COVID-19.³

During the surge of COVID-19, when patients are mostly asymptomatic, the appearance of skin lesions like urticaria, erythema nodosum or chilblain-like lesions may give clue to COVID-19 infection. The cutaneous manifestations that were encountered in a case series in Nepal were urticaria, pityriasis rosea, herpes labialis, and maculopapular rash with conjunctivitis of both eyes.¹⁵ Given the types, patterns and distribution of lesions during pandemics, it is always better for patients and clinicians to diagnose and initiate early management to avoid complications.

The study's main drawback was that it only included individuals who had already been admitted. We had the option to survey patients who were kept at home alone. Due to the dearth of studies conducted in Nepal, comparisons with studies conducted at other institutions could not be made. Additionally, there was no follow-up research that might have provided a richer picture.

Conclusion

The majority of COVID 19 patients in our study exhibited urticaria and erythema nodosum. Knowing the many forms of skin lesions associated with this illness is crucial for early diagnosis and prompt isolation of the patient to stop the disease's spread. It is advised to do a more extensive investigation including multiple centers.

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