

# Pityriasis Rosea-Like Eruption by Covid-19 Infection: A New Case Report

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## Abstract

**Background:** Coronavirus disease (Covid-19) becomes a pandemic worldwide in 2020. Different dermatological manifestations associated with Covid-19 infection like maculopapular, morbilliform, urticarial, vesicular, chilblain-like, petechiae, purpura, and livedoid rashes. Pityriasis rosea (PR) and PR-like eruptions were recently reported to increase in coronavirus cases. **Aim:** To evaluate and review the literature on PR and PR-like eruption associated with Covid-19 disease. **Case Report:** A 24-year-old female patient presented with a history of asymptomatic PR-like eruption that started during infection with the Covid-19 virus and resolved spontaneously over 14 weeks without therapy. **Conclusion:** PR and PR-like eruptions are not uncommon with Covid-19 disease and could be the early manifestation of SARS-CoV-2 virus infection.

## Keywords

Pityriasis Rosea, Covid-19, Human Herpesvirus, Pityriasis Rosea-Like Eruption

## 1. Introduction

PR is a self-limiting acute erythematous papulosquamous exanthem, also known as pityriasis circinata, roseola annulata, and herpes tonsurans maculosus [1]. The exact etiology remains unknown [2]. Several types of research suggest that possible causes include viral sources; predominantly reactivation of Human Herpesvirus 6 and 7 (HHV-6/HHV-7), medications, vaccinations, and psychological

stress [3] [4]. It affects young adults, mainly those aged between 10 and 35, with a worldwide incidence of 0.5% to 2%, making up 0.68 per 100 dermatological patients [4] [5].

The disease is characterized by a prodrome of flu-like symptoms, followed by an initial eruption of a mother patch, a solitary pink-colored patch or plaque otherwise known as Herald patch. This is followed by multiple secondary eruptions of smaller erythematous scaly patches that appear symmetrically along cleavage lines in a “Christmas tree” distribution and are associated with collarette scaling [2]. The disease is mostly asymptomatic, except for pruritus which is evident in 25% to 75% of cases [6] [7]. Lesions typically resolve spontaneously leading to postinflammatory hyperpigmentation or hypopigmentation [8].

The classification proposed for PR is based on pathogenesis, clinical features, and course of the disease; stratifying the disease into classic and atypical types of PR. Classic PR resolves within a duration of 6 to 8 weeks, with bed rest being the preferred therapeutic modality. Persistent PR, a subtype of atypical PR which constitutes 20% of cases, lasts more than 12 weeks and is treated using different treatment modalities like acyclovir, through its antiviral properties, or Erythromycin, through its anti-inflammatory and immunomodulatory properties [4] [9] [10] [11]. Additionally, symptomatic treatments with emollients, antihistamines, or steroids are used [8].

In 2019, the outbreak of Covid-19, which is a respiratory disease caused by the SARS-CoV-2 virus, led to a pandemic. Transmission mainly occurs through respiratory droplets with symptoms varying from mild to severe [12]. Skin manifestations have been associated with Covid-19 infection, with a range varying from 0.2% to 45% and systemic reviews displaying a frequency of 6% [13]. Most common manifestations include maculopapular, morbilliform, urticarial, vesicular, chilblain-like, petechiae, purpura, and livedoid rashes [14] [15]. Less common manifestations include PR, as shown by several other reports [16]-[25]. PR in the setting of Covid-19 infection is thought to be a result of the Covid-19 virus reactivating HHV-6 and 7 [26].

PR is diagnosed based on clinical features, although further diagnostic tools may be needed in cases of atypical presentations. Histopathology shows focal parakeratosis, spongiosis, acanthosis in the epidermis, and extravasated red blood cells accompanied by a perivascular infiltrate of lymphocytes, monocytes, and eosinophils in the dermis [2]. Lately, dermoscopy has been considered a useful noninvasive tool for diagnosing various dermatological disorders [27]. PR findings on dermoscopy can show collarette scales, central yellow with peripheral reddish background, peripheral dotted vessels with patchy distribution, diffuse reddish background, scattered dotted vessels, and irregularly distributed scales and red globules, respective of their commonality [28].

In the present case report, we are describing a 24-year-old female patient who presented with a history of asymptomatic PR-like eruption for 14 weeks that started during infection with the Covid-19 virus, involving the trunk and upper extremities with scaling and remnant post-inflammatory hyperpigmentation on

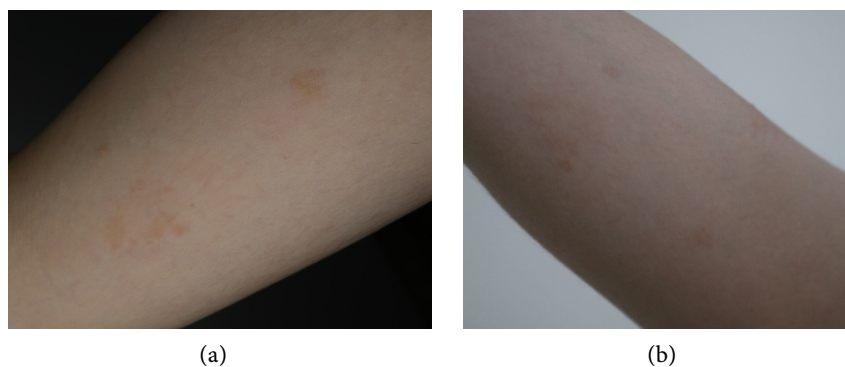
resolved sites. The condition partially improved following the administration of oral acyclovir, a topical steroid, and salicylic acid treatment for 7 days. Complete resolution was achieved spontaneously after 14 weeks without therapy. A written consent form was taken from the patient about the publication of her condition.

## 2. Case Report

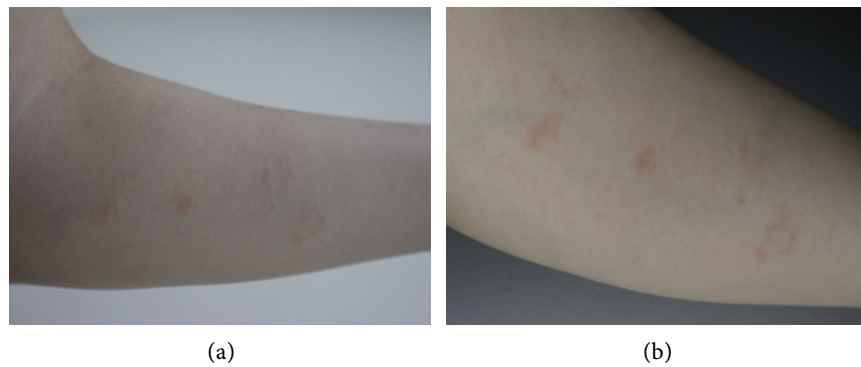
A 24-year-old female, previously healthy, presented to our dermatology clinic with a 4-week history of an episodic nonpruritic rash involving the chest and both upper extremities. The rashes were preceded by a single and oval salmon-colored herald patch on the right arm that lasted for 3 weeks. Following the appearance of the patch for 2 days, the patient developed high-grade fever, fatigability, myalgia, and mild cough. PCR testing revealed a positive Covid-19 result, after which the patient was quarantined and did not seek medical attention. Twenty-one days following the appearance of the Herald patch, there was a secondary eruption of small scaly patches with slightly raised edges, ranging from 1 to 3 cm in size. The lesions appeared bilaterally on the inner arms, forearms, and chest. After the appearance of those eruptions, the patient presented to our dermatology clinic. The patient also reported a painful lesion on the sole of the left foot consistent with the diagnosis of plantar warts. Following the secondary eruption by 8 weeks, the patient reported an aphthous ulcer on the inner left cheek.

On examination, the patient presented with multiple erythematous papules and plaques with partially scaly borders and central fading located on both inner sides of the arms, forearms, and trunk area sparing the face, feet, and hands. The plaques are ovular and elliptical varying from 0.5 - 2 cm in size, showing central clearing and fine scales consistent with the characteristic collarette appearance. Resolving plaques display post-inflammatory hyperpigmentation (**Figure 1** and **Figure 2**).

Investigations ordered included CBC, RPR, TSH, Iron stores, Zinc level, vitamin B12, vitamin D, and KOH test to exclude fungal infection all of which turned out to be normal. Differential diagnoses included tinea corporis, zinc deficiency, lichen planus, psoriasis, and secondary syphilis. The clinical picture was consistent with PR-like eruption.



**Figure 1.** Right forearm showing multiple erythematous papules and plaques with partially scaly borders and central fading (a), (b).



**Figure 2.** Left forearm showing multiple erythematous papules and plaques with partially scaly borders and central fading (a), (b).

Histopathology examination demonstrated subacute spongiosis with overlying foci of parakeratosis. Perivascular lymphocytic infiltrates were also found to be present, all of which are features in combination with clinical presentation consistent with a PR-like eruption.

Treatment with oral Valacyclovir 500 mg in combination with the topical ointment of Betamethasone Dipropionate equivalent to Betamethasone 0.05% w/w and Salicylic acid 3.0% w/w was commenced for 14 days. Improvement was observed and the resolved plaques left post-inflammatory hyperpigmentation which then faded spontaneously. After the course of treatment, there was a relapse of five to six erythematous, nonpruritic plaques with partially scaly borders and central fading located on both inner sides of the arms and forearms over a period of 6 weeks. Complete resolution of the disease occurred over 14 weeks without further management.

### 3. Discussion

SARS-CoV-2, the cause of Covid-19 disease, is a respiratory virus. However, several cutaneous manifestations have been reported to be associated with the disease since the start of the pandemic in 2020 [29] [30] [31] [32]. The pathogenesis of Covid-19 involves its effect on the target pulmonary tissues, in addition to a systemic immune-mediated inflammatory environment that affects other organs such as the kidneys, lungs, and endothelium. A recent study conducted in Italy demonstrated that 20.4% of patients hospitalized due to Covid-19 developed cutaneous manifestations, one of which was erythematous rashes [33]. Another study revealed approximately a five-fold increase in PR cases from April to May 2020 compared to the same period in 2019 before the pandemic. During this period, PR cases presenting to the dermatology clinic increased from 0.8% to 3.9% [26].

The flu-like prodrome that precedes PR and the clinical resemblance of the rash to those of other infectious exanthems are suggestive of an infectious cause, though vaccination, psychological stress, and drugs have also been described as causes [34]. Through evidence of DNA in plasma and mRNA in lesions, a reactivating role for HHV-6 and/or HHV-7 has been established in the pathogenesis

of PR [2] [34] [35] [36] [37] [38]. HHV-6 and HHV-7 are members of the Human Herpes family of viruses and are commonly transmitted in the first two years of life and then remain latent in the body [38].

The reactivation of these viruses can be associated with various triggers, such as stress, fever, trauma, states of immunosuppression, or sun and UV exposure [39]. In addition, viruses have been found to have a role in reactivating other latent viruses. HHV-7 is suggested to have a reactivating role for HHV-6, by acting as a primer for the transcription of the latent HHV-6, after which HHV-6 dominates and HHV-7 goes undetected by PCR or serology [40]. This interaction is not only limited to the Herpes family, but also other viruses including CMV, HIV, HPV, and EBV [39]. Two other studies have suggested the possibility of EBV reactivation in the setting of Covid-19 infection [23] [24].

In one study, PCR results for SARS-CoV-2 in a fresh skin biopsy specimen of the patient came to be negative, leading to the conclusion that the role of SARS-CoV-2 lies in the reactivation of the latent virus. Furthermore, through histopathology, Gianotti *et al.* (2020) revealed ballooning and multinucleated keratinocytes in a patient with diffuse skin eruption and Covid-19, findings that might be due to HHV-6 and/or HHV-7 reactivation [41]. Consequently, we can infer that SARS-Cov-2 can have a similar role in reactivating HHV-6 and HHV-7, which explains the noticeable increase in PR cases since the beginning of the pandemic [26]. This theory, as well as SARS-COV-2 triggering a viral chain reaction, was also suggested by Drago *et al.* (2021) [24]. Moreover, this can also explain the plantar wart, in which we can speculate that SARS-COV-2 may have a role in not only activating HHV-6 and HHV-7, but also Human Papilloma Virus responsible for plantar warts.

Covid-19-associated cutaneous manifestations have been increasingly identified and reported [15]. So far, 10 studies have been reported in the literature have been found to describe a temporal relationship between Covid-19 infection and PR or a PR-like eruption, in which PR followed Covid infection or cases of Covid presenting with PR. Most of the cases described a prodrome consisting of fever, headache, cough, fatigue, myalgia, and arthralgia, all of which are also consistent with the symptoms of the Covid-19 infection itself. In our present case, the patient also described similar symptoms around the time of the emergence of the Herald patch and the beginning of the rash. The rash was pruritic in some cases and required antihistamines to relieve the symptoms [17] [19] [22] [23] [25], but in the present report, the rash is not pruritic. The Christmas Tree pattern was observed in a few cases, but not in the present case report [18] [19] [23] [24] [25]. Nevertheless, similar to the other cases, the rash appeared on the chest and upper extremities. Another feature that was similar to the other published reports was the long duration of the disease, 14 weeks to resolve completely in our case, which is considered an atypical feature of PR [2]. Regarding treatment, the cases in the literature were treated symptomatically using antihistamines, topical, and oral steroids [17] [19] [20] [21] [23] [25]. Meanwhile in our case, the patient was treated with oral acyclovir in addition to symptomatic

treatment with topical steroids but was not shown to be effective. This atypical clinical presentation, persistent lesions, longer than usual duration, and the lack of responsiveness to standard treatment was also described by several other studies looking into concurrent Covid-19 infection and PR [34]. It might be worth mentioning that there are cases of which PR appeared in association with the Covid-19 vaccine rather than infection.

#### 4. Conclusion

In Conclusion, PR and PR-like eruptions are not uncommon with Covid-19 disease and could be the early manifestation of SARS-CoV-2 virus infection. This eruption may be due to a reactivation of the HHV-6 virus or may be reactional the multisystem inflammatory syndrome related to SARS-CoV-2 infection. Additional studies are warranted to establish this association. The importance of this report is to ensure physicians' awareness of various skin manifestations of coronavirus disease which may precede the infection. In addition, our study is the first study in the MENA region demonstrating a PR-like eruption as an early manifestation of SARS-CoV-2 virus infection.

#### Disclosure

This study is an independent study and not funded by any of the drug companies.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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