

A case report of psoriasis exacerbation following COVID-19

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Abstract

The article presents a clinical case of severe exacerbation of psoriasis after a novel coronavirus infection. A 60 years old patient who has recovered from Corona Virus Disease 2019 (COVID-19) was admitted to the Republican Skin and Venereal Disease Dispensary of the Republic of Tatarstan for inpatient treatment with a diagnosis “Large plaque psoriasis involving palms and soles. Progressive stage. Scalp psoriasis. Nail psoriasis”. This was the first time the patient had experienced psoriasis exacerbation of this severity in his medical history. Presumably, exacerbation of psoriasis was due to the use of hydroxychloroquine. The exacerbation of psoriasis during the pandemic outbreak of Coronavirus disease can be explained by the following reasons: use of hydroxychloroquine, excessive inflammatory response to COVID-19, psychological stress, anxiety, depression, the decline in household income, limited outdoor activities. It is necessary to focus attention of physicians to the fact that patients who have suffered from COVID-19 may develop exacerbation of psoriasis.

Keywords: psoriasis, coronavirus infection, hydroxychloroquine, clinical case.

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Psoriasis is a chronic papulosquamous dermatosis of a multifactorial nature with a genetic, lipid, and immunosuppressive orientation. The prevalence of psoriasis in different countries ranges from 0.1% to 3%. In Russia, it is approximately 1%, and it is often detected among the indigenous inhabitants of the Far North [1]. In the USA and Canada, the prevalence of psoriasis is 4.6% and 4.7%, respectively, while among African Americans and Asians, the prevalence is significantly lower, from 0.4% to 0.7%. It is also known that in two-thirds of patients, psoriasis is mild or moderate, and it is severe only in a third of patients [2].

A 2010 study conducted by the international organization IFPA revealed that 125 million people with psoriasis were registered globally [3]. Psoriasis can manifest initially at any age; there are 2 peaks in the age of disease onset, 1 at 20–30 and another at 50–60 years. As a rule, in 75% of patients, the initial manifestations of psoriasis appear before the age of 40 years [4].

In the pathogenesis of psoriasis development, hereditary predisposition; dysfunctions of the immune, endocrine, and nervous systems; and the adverse effects of environmental factors are of great importance. A number of genes have been described, the presence of which predisposes the person to disease development [3]. It is known that

the risk of type I psoriasis is especially high in the presence of HLA histocompatibility antigens of types Cw6, Bw57, and DR7.

The disease is accompanied by an increase in the levels of interferon- γ , type 1 T-helper lymphocytes, and interleukin-17 synthesized by type 17 T-helper lymphocytes [5].

The initiating factors include psychoemotional overstrain, chronic infections (usually streptococcal), alcohol abuse, use of medications such as lithium salts, β -blockers, chloroquine, hydroxychloroquine, oral contraceptives, and interferon and its inducers [3].

Currently, due to the pandemic of a new coronavirus infection (COVID-19, coronavirus disease), an increase in the number of patients with severe exacerbation of psoriasis in the presence of this infection has been noted [6]. The use of hydroxychloroquine as an etiotropic treatment for mild or moderate COVID-19 is a likely trigger of the development of psoriasis exacerbation [7].

Sachdeva et al., in their systematic review of the effects of hydroxychloroquine on psoriasis, identified 18 cases of hydroxychloroquine-induced psoriasis. In 50.0% of these cases, psoriasis was detected for the first time, in 27.8% cases, there was an exacerbation of psoriatic lesions, and in 22.2%, a relapse of psoriasis occurred after treatment with this drug.

In addition to the well-known side effects of hydroxychloroquine, including prolongation of the *QT* interval and cardiomyopathy, the possible effect of hydroxychloroquine on deterioration, relapse or re-onset of psoriatic lesions is also important to recognize [8]. This drug can increase the synthesis of interleukin-17, which results in increased growth of keratinocytes [9]. Hydroxychloroquine causes an initial disruption of the epidermal barrier function (probably by inhibiting transglutaminase activity), followed by a physiological epidermal response aimed at barrier restoration. This nonspecific stimulus of epidermal proliferation is probably sufficient to trigger psoriasis in genetically susceptible people [10].

In a study conducted by Kutlu and Metin in Turkey including 52 patients, the primary aim was to determine whether psoriasis patients are more vulnerable to COVID-19. Psoriasis was revealed to be one of the most common dermatological diseases in COVID-19 patients. According to doctors, this could be facilitated by drugs used in the treatment of psoriasis, namely cytostatic drugs such as methotrexate, biological drugs (e.g., infliximab, neta-kinab), long-term use of potent local glucocorticoid ointments (betamethasone 0.1%). In this regard, they concluded that psoriasis patients may be more vulnerable to COVID-19 [11].

The inflammation process is significant in the pathogenesis of psoriasis. It can be assumed that the status of hyperinflammation caused by COVID-19 has an impact on the course of psoriasis. In their study, Ozaras et al. revealed that the state of hyperinflammation caused by COVID-19 itself can exacerbate psoriasis [12]. The presence of COVID-19 infection is accompanied by signs of hyperinflammation caused by excessive cytokine production [7]. The number of inflammatory biomarkers, such as C-reactive protein and ferritin, was found to be significantly increased in patients with COVID-19 [13].

Analyzing the causes of psoriasis exacerbation in the current epidemiological situation, it should be noted that stress often becomes a triggering factor in the emergence of psoriasis. Internet research conducted in China by Kuang et al. in the spring of 2020, examining the relationship between outdoor activity restriction and loss of income and psoriasis outcomes reported by patients during the COVID-19 pandemic revealed that 43.7% of 926 patients described moderate to significant worsening of psoriasis. Restriction of outdoor activity was found to be positively correlated with exacerbation of psoriasis. Financial instability in society, job loss resulting from a pandemic cannot but affect the psychoemotional background of patients, as

they become more susceptible to the development of anxiety conditions and depression, which in turn negatively affects immune status [14].

The second edition of April 23, 2020, of the recommendations of the Russian Society of Dermatovenereologists and Cosmetologists on systemic therapy of psoriasis during the COVID-19 pandemic states that “psoriasis (including psoriatic arthritis) is not a contraindication for any type of treatment for COVID-19 infection” [15].

This article presents a clinical case of severe exacerbation of psoriasis after coronavirus infection.

A 60-year-old patient was admitted on September 19, 2020 to the inpatient department of the Republican Clinical Dermatovenereologic Dispensary (RCDVD) with complaints of rashes on the skin of the trunk, arms, and legs and recurrent itching of the skin.

He considered himself to have been ill since 1974, when rashes first appeared on the scalp and elbows, but the patient did not seek medical help at that time; he applied an ointment with prednisolone and zinc on his own and noted a temporary improvement. He associated the disease onset with stress associated with adversity in his family history. In March 1986, the pathological process became widespread. In April 1986, he visited the outpatient department of RCDVD, where he was diagnosed with plaque psoriasis but refused hospitalization. According to the patient, treatment with prednisolone, sodium thiosulfate, vitamins, and topical 2% salicylic ointment and 0.05% betamethasone cream were prescribed. The patient believed that the treatment was effective.

The patient noted relapses of the skin process approximately once a year, mainly in the spring and summer period. During an exacerbation, he used glucocorticoid ointments. The present exacerbation has been registered since September 19, 2020 after the COVID-19 infection, complicated by community-acquired polysegmental viral pneumonia. He was treated from 09/07/2020 to 09/17/2020 at the specialized COVID hospital of the city clinical hospital No. 18. According to the discharge orders from the COVID hospital, he received treatment with hydroxychloroquine 400 mg twice daily on day 1, followed by a dose reduction to 200 mg twice daily for 6 days, azithromycin 500 mg orally once daily, enoxaparin sodium 8000 IU twice daily subcutaneously, and paracetamol 500 mg orally in the case of an increase in body temperature above 38.5°C. For the treatment of psoriasis, the patient applied independently topical prednisolone and 2% salicylic acid ointments. He noted that he had a pronounced exacerbation of psoriasis with the emergence of solid plaques and



Fig. 1. Psoriatic plaques



Fig. 2. Psoriatic papules



Fig. 3. Psoriasis of the fingers

the involvement of the palmar surfaces and fingers for the first time.

Upon examination, the pathological process was widespread and symmetrical. It was localized on the scalp, over the entire surface with plaques 5–7 cm in diameter, infiltrated, covered with densely fixed crusted scales of a dirty yellow color with whitish scales on the surface. On the skin of the trunk on the chest, back, and lateral surfaces and on the upper and lower extremities, mainly their extensor surfaces, there were multiple papules ranging in size from 0.7 to 3 cm, plaques ranging in size from 3.5 to 10–15 cm of a stagnant red color, infiltrated, covered with silvery scales; along the periphery of most papules, there was a hyperemic border (positive Pilnov's symptom). The psoriatic triad was positive. The Koebner symptom was positive (Fig. 1,2). The nail plates were yellow and had transverse striations. Salmon patch and pitting signs were also positive (Fig. 3). On the skin of the palms and soles, in the presence of foci of infiltration, there was a layering of crusted scales of a dirty yellow color with scraps of the epidermis. The photographic material was published in the medical press with the patient's written consent.

Based on the data from the anamnesis and clinical examination, widespread guttate-discoïdal-plaque psoriasis vulgaris with progressive-stage lesions on the palms and soles, psoriasis of the scalp, and psoriasis of the nail plates were diagnosed.

The following set of laboratory studies was performed.

Clinical blood testing showed hemoglobin 135 g/l, erythrocytes $4.4 \times 10^{12}/l$, platelets $534 \times 10^9/l$, leukocytes $5.5 \times 10^9/l$, basophils 1%, eosinophils 1%, stab neutrophils 5%, segmented neutrophils 67%, lymphocytes 32%, monocytes 6%, and erythrocyte sedimentation rate 32 mm/h. In the clinical blood test, the count of platelets and the erythro-

cyte sedimentation rate were increased. Probably, the changes in the analysis were associated with a previous infection with COVID-19 complicated by community-acquired polysegmental viral pneumonia.

A biochemical blood test showed glucose 4.5 mmol/L, total protein 67 g/L, cholesterol 3 mmol/L, alanine aminotransferase 14 U/L, aspartate aminotransferase 14 U/L, total bilirubin 6 $\mu\text{mol/L}$, creatinine 81 $\mu\text{mol/L}$, urea 3.8 mmol/l, and uric acid 240 $\mu\text{mol/l}$. Indicators of biochemical blood analysis were within normal limits.

In the general analysis of urine, specific gravity was 1010, no protein or glucose was detected, leukocytes were 1–2 in the field of view, squamous epithelium was 1–2 in the field of view. General urinalysis data represented a variant of the norm.

A study of the biomaterial from foci did not detect elements of fungi.

Complex treatment according to clinical guidelines [16], was prescribed to the patient, as well as narrow-band medium-wave phototherapy with a wavelength of 311 nm (16 procedures), methotrexate solution 15 mg intramuscularly once per week No. 4, and 0.025% betamethasone cream for topical application. The therapy caused no side effects.

After the treatment, there was no appearance of new elements, large plaques disintegrated into separate papules, which were characterized by the presence of desquamation over the entire surface, the marginal ridge (growth zone), anemia zone (Jadasson's symptom), and pseudoatrophic rim around the papules (Voronov's symptom) were not revealed. In place of the primary elements (papules, plaques), hyperpigmented spots with a diameter of 0.2–20 cm were observed.

Conclusion. Practicing physicians must focus attention on the fact that infection with the new COVID-19 can cause the development of a pronounced exacerbation in patients with psoriasis.

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