ARQUIVOS DE ASMA, ALERGIA E IMUNOLOGIA




# Pityriasis lichenoides after COVID-19 vaccination: a case report

*Pitiríase liquenoide pós-vacinação contra COVID-19: um relato de caso*

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**ABSTRACT**

This study addresses the first case report of pityriasis lichenoides development after COVID-19 vaccination. A literature review found few studies describing pityriasis lichenoides as an adverse reaction to other vaccines. Although it is an immune-mediated inflammatory response, the development mechanism of this disease remains not well known. The diagnosis of pityriasis lichenoides is clinical and is considered a challenge due to the considerable number of differential diagnoses and the different forms of presentation of the disease. Thus, most cases require confirmation by biopsy and laboratory tests. Therapeutic options may include the use of antibiotics and immunosuppressants. The effectiveness of phototherapy is also highlighted as the treatment of choice for pityriasis lichenoides, as it can promote an almost complete resolution of lesions without causing systemic effects, unlike other therapies.

**Keywords:** Pityriasis lichenoides, COVID-19 vaccines, vaccines.

**RESUMO**

O artigo aborda o primeiro relato de caso que associa o desenvolvimento de pitiríase liquenoide com a vacinação contra a COVID-19. Em uma revisão literária foram encontrados escassos estudos que associam a pitiríase liquenoide como reação a outras vacinas. O mecanismo de desenvolvimento da doença ainda não é bem conhecido. Sabe-se apenas que se trata de uma reação inflamatória imunomediada. O diagnóstico da pitiríase liquenoide é clínico e é considerado um desafio, devido ao grande número de diagnósticos diferenciais e das diferentes formas de apresentação da doença. Desse modo, a maioria dos casos exige amparo na biópsia e em exames laboratoriais. As opções terapêuticas podem incluir o uso de antibióticos e imunossupressores. Destaca-se ainda a efetividade da fototerapia como tratamento de escolha da pitiríase liquenoide, podendo proporcionar uma resolução quase que completa das lesões e não causar efeitos sistêmicos que outras terapias poderiam trazer.

**Descritores:** Pitiríase liquenoide, vacinas contra COVID-19, vacinas.

## Introduction

Pityriasis lichenoides (PL) is an uncommon immune-mediated dermatological disorder of unknown etiology. However, it is known that it can occur in association with exposure to drugs, infections, radiological contrast and vaccines.[1]

The disease can manifest in two ways: pityriasis lichenoid et varioliformis acuta (PLEVA) and pityriasis lichenoides chronica (PLC).[2] The first refers to an acute condition characterized by multiple ulcerated lesions or crusted reddish papules, which usually heal leaving after effects, such as hyper/hypopigmentation or varioliform scars. It has variable remission periods, with a limited course. The second is manifested through reddish-brown scaly papules that can last for years and also generate sequelae. However, there are cases with lesions that refer to both diagnoses.[2,3] In

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addition, there is a clinical variant of PLEVA, febrile ulceronecrotic Mucha-Habermann disease (FUMHD), which is characterized by ulceronecrotic skin lesions associated with high fever and systemic symptoms. It is a more serious condition with malignant potential associated with T4 lymphoid proliferations.

The diagnosis of PL is clinical and requires differential investigations for chickenpox, lymphomatoid papulosis, secondary syphilis, vasculitis and pityriasis rosea.[5] Therefore, for the etiological differentiation, laboratory tests and/or histological analysis are necessary.

This study aims to report a case of post-vaccination PL with the SARS-CoV-2 CoronaVac® vaccine, describing the findings and clinical management.

## Case report

A previously healthy 20-year-old female patient attends a dermatological consultation after noticing the appearance of red, non-pruritic papules on the entire body surface for about a week and a half. The appearance of the lesions occurred three days after the first dose of the vaccine against SARS-CoV-2 developed by Sinovac (China) and produced in Brazil by the Butantan Institute (Instituto Butantan).[6] CoronaVac is composed of the inactivated virus and an aluminum hydroxide solution.[7] The vaccine was performed by intramuscular injection in the right deltoid (0.5 mL). The patient reported that the lesions started slowly on the trunk, but quickly progressed to other areas of the body. It is noteworthy that the papules appeared in regions with less sun exposure, such as the internal and posterior regions of the limbs. On clinical analysis, the presence of erythematous papules is confirmed (Figure 1). Only in the popliteal fossa was the presence of three violaceous lesions observed. This fact suggests that the lesions were in different stages of development. On the thorax, there were larger lesions with scaling on the collarette. To control the lesions, it was recommended to use a cream manipulated with a low concentration of desonide (0.05 mk) in 100 mL of moisturizing lotion, applied once a day, but without response.

Treponemal and non-treponemal tests for syphilis were requested, which came back negative. After the second dose of vaccine, an increase in lesions was noticed, indicating biopsy and the start of lymecycline (300 mg) once a day.

Biopsy was performed in three different areas, with histopathological analysis showing similar changes. Among the findings, the epidermis showed mild irregular acanthosis, multifocal parakeratosis with serous lakes, moderate multifocal spongiosis, very rare lymphocyte exocytosis and necrotic keratinocytes. The superficial dermis showed edema and moderate lymphocytic perivascular inflammatory infiltrate with extravasated red blood cells. The findings suggest spongiotic and interface dermatitis. Thus, the hypothesis of PL was confirmed, ruling out differential diagnoses. At this time, treatment with tetracycline was started (500 mg) twice a day for ten days; however, no improvement.

According to the findings, the confirmed diagnosis was PLC, although the period between the onset and resolution of the lesions is compatible with PLEVA. Thus, the assistant physician opted for a milder treatment, with ten sessions of phototherapy, noting a significant resolution of the lesions after the second session.

**Figure 1**
Aspects of chest and limb injuries

## Discussion

In this case, the hypothesis is that the vaccine has triggered an immune-mediated inflammatory reaction. Therefore, the relevance of this study is remarkable as it is the first reported on the association of PL with COVID-19 vaccination. During the literature review, few studies were found relating PL with other types of vaccine, such as the MMR, influenza and adult vaccine.[1,8,9] It is therefore suggested that PL is triggered by an inflammatory response to extrinsic antigens. The SARS-CoV-2 Coronavac® vaccine is administered in two doses, with an interval of two to four weeks. As it is a recently developed vaccine, there is still no concrete data on the characterization and frequency of all its adverse effects.

PL is a dermatological disease related to the formation of lesions with wide variations in morphology. Primary lesions in PLEVA develop forming central necrosis with hemorrhagic crust and have gradual resolution.[3] In PLC, these lesions present as a monomorphic picture of erythematous-brown papules covered by an adherent scale. Both the chronic and acute conditions are more prevalent in males, and affect adolescents and young adults.[10]

The diagnosis is clinical and confirmed by biopsy, however it is a challenge due to the multiple differential diagnoses. In addition, there may be overlap between their classifications. Histopathological findings include superficial paravascular or lichenoid lymphocytic infiltrate with vacuolar alteration of the basal layer, parakeratosis, individual necrotic keratinocytes in the epidermis and extravasation of red blood cells.[3] Such alterations are more evident in PLEVA, whereas in PLC they are less exuberant. The histopathological description is compatible with the patient, and a PLC picture is suggested.

The disease has a variable course and common recurrences. PLEVA usually resolves in weeks, while PLC can take months.[2] Treatment may involve topical agents, antibiotics, phototherapy and immunosuppressants.[2] Antibiotic therapy with erythromycin or tetracycline may be beneficial in reducing the course of the disease.[3] In the case of the patient, lymecycline was started and then tetracycline was used. Although the former is derived from tetracycline, there are cases of unsatisfactory response, while the latter may be effective. Phototherapy is the treatment of choice when there is no response to the use of oral antibiotics.[2] This method was effective in the patient's case. In severe and refractory cases, systemic corticosteroids, methotrexate or cyclosporine are indicated.[2]

## Conclusion

Pityriasis lichenoides is an uncommon disease, sometimes requiring biopsy support for differential diagnosis.

This case report addressed the first reported condition of pityriasis lichenoides chronica related to the CoronaVac® vaccine.

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