

CASE REPORT

Methotrexate Therapy in Patients With Psoriasis Vulgaris

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ABSTRACT

Psoriasis is a chronic inflammatory disease of the skin in the form of changes in the growth and differentiation of the epidermis, as well as biochemical, immunological and vascular abnormalities. Psoriasis can manifest on the skin, nails, and joints. The diagnosis of psoriasis is usually made based on the history and clinical appearance of the skin lesions. In certain cases, examinations such as histopathological biopsy and laboratory examination are required. Histopathologically, acanthosis, parakeratosis, elongation of the rete ridge will appear. Migrating neutrophils and lymphocytes were seen forming Munro's microabscesses. In the dermis, signs of inflammation will appear such as hypervascularity and dilatation and edema of the dermal papillae. Laboratory tests for psoriasis are nonspecific. Broad-spectrum anti-psoriasis treatments, both topical and systemic, are available. Most of these drugs work as immunomodulators. Before choosing a treatment regimen, it is important to assess the extent and severity of psoriasis. One of the most frequently used ways to assess the severity of psoriasis is to calculate the Psoriasis Area and Severity Index (PASI) score.

Keywords: *Psoriasis, Chronic inflammation, Skin, Psoriasis Area and Severity Index*

INTRODUCTION

Psoriasis is a chronic inflammatory skin disease characterized by changes in epidermal growth and differentiation, as well as biochemical, immunological, and vascular abnormalities. Psoriasis can manifest itself in the skin, nails, and joints. 1 Disease onset can occur at any age, but many studies show a bimodal pattern in psoriasis, with the first onset occurring between the ages of 15 and 20, and a second

peak occurring around the ages of 55 and 60. 2,3 The prevalence of psoriasis varies among populations, ranging from 0.1 to 11.8%, with incidence generally equal in men and women. 1,2

The etiology of psoriasis is not fully understood, but it is suspected that there is an interaction between genetic factors, the immune system, and triggering factors. 4 Psoriasis is an inflammatory skin disease mediated by the

family history of the same condition was acknowledged, including her father.

Physical examination revealed a good general condition, compos mentis consciousness, blood pressure of 120/80 mmHg, pulse rate of 80 beats/minute, respiratory rate of 20 breaths/minute, and body temperature of 37.2°C. She was well-nourished, with no pale conjunctivae and no icteric sclerae. There was no hepatosplenomegaly or enlarged lymph nodes. She was 162 cm tall and weighed 56 kg.

Dermatological examination revealed multiple erythematous plaques ranging from nummular to plaque-like in size with thick white scales on the surface, as well as multiple lenticular to nummular erosions in the left infrascapular, left lateral, right and left lumbar, sacral, right and left anterior and posterior antebrachial, right and left patellar, right and left anterior and posterior cruciate, and right and left posterior genu regions. Auspitz's sign (positive), wax drop phenomenon (positive), and Koebner phenomenon (positive) were present. (Figure 1) The Psoriasis Area and Severity Index (PASI) score for this patient was 15.20.



Figure 1. The patient's initial presentation. Multiple erythematous plaques, ranging from nummular to plaque-like in size, with thick white scales on the surface, as well as multiple lenticular to nummular erosions, were found in the left infrascapular, left lateral, right and left lumbar, sacral, right and left anterior and posterior antebrachial, right and left patellar, right and left anterior and posterior cruciate, and right and left posterior genu regions. Auspitz's

sign (positive), wax drop phenomenon (positive), and Koebner phenomenon (positive).

The patient was differentially diagnosed with psoriasis vulgaris, tinea corporis, and parapsoriasis, with a provisional diagnosis of psoriasis vulgaris. Skin scrapings with 10% KOH revealed no hyphae or spores. The working diagnosis was psoriasis vulgaris. The patient was given topical therapy in the form of an emollient, namely 10% carbonyl diamide cream (Soft-U-derm®) applied twice daily, oral cetirizine tablets 1x10 mg/day, and planned administration of oral methotrexate. Prior laboratory tests included routine urine, complete blood count, liver and kidney function tests, cholesterol, and blood sugar levels (KGD). A skin biopsy was also planned. On September 30, 2023, the patient returned with the laboratory and biopsy results. Blood tests on April 16, 2013, showed a routine urine test within normal limits, with a hemoglobin level of 15.3 g/dL, a hematocrit of 42.5%, a white blood cell count of $5.75 \times 10^3/\text{mm}^3$, an erythrocyte count of $4.82 \times 10^6/\text{mm}^3$, a platelet count of $240,000/\text{mm}^3$, an erythrocyte sedimentation rate (ESR) of 10 mm/hour, and a differential count of Neu 59.8/Lym 29.4/Mon 8.3/Eos 2.3/Bas 0.2, SGOT 24 U/L, SGPT 37 U/L, urea 34.2 mg/dL, creatinine 0.93 mg/dL, and a random blood sugar level of 95.8 mg/dL.

The patient's histopathological examination results, performed on September 23, 2023, macroscopically:

Received 1 piece of tissue the size of a cumin seed, grayish white in color. Microscopic: Preparation with intact epithelial lining experiencing hyperkeratosis, parakeratosis, acanthosis and papillomatosis with elongated rete ridges. The coating shows abscess foci in the superficial epidermis (Munro microabscess) and abscess in the subcorneal (Kogoj abscess), the subepithelial stromal tissue is thinning in the next section, densely arranged collagen tissue is visible. In the dermal papilla, blood vessel

proliferation is visible. No signs of malignancy are found in this preparation.

CONCLUSION

Based on the laboratory results above, no liver or kidney dysfunction was found. The patient was then given oral methotrexate therapy with an initial dose (test dose) of 5 mg/24 hours/week (administration is 2.5 mg/12 hours/week) and emollients, namely 10% urea cream (Tupepe®) applied twice daily, desoximetason + salicylic acid 5% cream applied twice daily, and cetirizine 10 mg tablets/24 hours. The patient was advised to have liver and kidney function tests again and was advised to return for a follow-up visit in 1 week.

The first follow-up visit, two weeks later, on October 8, 2023, showed skin thickening, redness, and scaling had decreased, and no new lesions were found. The itching had subsided. On physical examination, the patient's general condition was good. Laboratory examination results on October 7, 2023 found liver function and kidney function within normal limits, namely SGOT 17 U/L, SGPT 28 U/L, urea 17.8 mg/dL, creatinine 1 mg/dL. Dermatological examination found multiple erythematous plaques measuring nummular to plaque with thick white scales on the surface, as well as multiple erosions measuring lenticular to nummular in the infrascapularis sinistra, lateralis sinistra, lumbar dextra et sinistra, sacral, antebraechii anterior et posterior dextra et sinistra, patellaris dextra et sinistra, cruris anterior et posterior dextra et sinistra and genu posterior dextra et sinistra began to decrease. (Figure 2). This patient's PASI score was 12.5.

The patient's methotrexate dosage was increased to 7.5 mg/week (divided into three doses of 2.5 mg every 12 hours per week), cetirizine 10 mg

tablets every 24 hours, and carbonyl diamide



10% cream (Soft-U-derm®) applied twice daily. The patient was advised to return for a follow-up visit in 2 weeks.

Figure 2. The patient at the first visit. Multiple erythematous plaques ranging from nummular to plaque-like in size with thick white scales on the surface were found, as were multiple lenticular to nummular erosions in the left infrascapular, left lateral, right and left lumbar, sacral, right and left anterior and posterior antebraechial, right and left patellar, right and left anterior and posterior cruciate, and right and left posterior genu regions. These lesions had begun to diminish. The Auspitz sign (positive), wax drop phenomenon (positive), and Koebner phenomenon (positive) were observed.

The second visit revealed a reduction in the redness and scaling. The itching had subsided. On physical examination, the general condition was good. Dermatological examination found lenticular erythematous plaques and hyperpigmented macules in the left infrascapular region, left lateral region, right and left lumbar region, sacral region, right and left anterior and posterior antebraechii region, right and left patellar region, right and left anterior and posterior cruris region and right and left posterior genu region. Well-defined erythematous plaques accompanied by scales and hyperpigmented macules were found in the right and left femoral region, right and left tibial region.



(Figure 3). This patient's PASI score was 10.5. The patient was advised to undergo routine blood and urine tests, as well as liver and kidney function tests to monitor for side effects of treatment. Management included methotrexate 7.5 mg/week (divided into three doses of 2.5 mg every 12 hours per week), cetirizine 10 mg every 24 hours, and 10% carbonyl diamide cream (Soft-U-derm®) applied twice daily. The patient was advised to return for a follow-up visit in 2 weeks.

Figure 3. Patient at the second follow-up visit. Lenticular-sized erythematous plaques and hyperpigmented macules were found in the left infrascapular region, left lateral region, right and left lumbar region, sacral region, right and left anterior and posterior antebrachial region, right and left patellar region, right and left anterior and posterior cruciate region, and right and left posterior genu region. A well-defined erythematous plaque with scales and hyperpigmented macules was found in the right and left femoral and right and left tibial regions.

The third follow-up examination showed the reddish patches had begun to diminish and the scales were no longer present. The itching had subsided. A physical examination revealed a good general condition. The patient presented with laboratory results, which showed a routine blood and urine routine within normal limits, and liver and kidney function tests within normal

limits: SGOT 17 U/L, SGPT 15 U/L, urea 27 mg/dL, and creatinine 0.6 mg/dL. A dermatological examination revealed lenticular-sized erythematous plaques and hyperpigmented macules in the left infrascapular, left lateral, right and left lumbar, sacral, and right and left anterior and posterior antebrachial regions (Figure 4). The patient's PASI score was 9.8. The patient was treated with methotrexate 7.5 mg/week (divided into three doses of 2.5 mg every 12 hours per week), cetirizine 10 mg every 24 hours for itching, and carbonyl diamide 10% cream (Soft-U-derm®) applied twice daily. The patient was advised to return for a follow-up visit in 2 weeks.



Figure 4. The patient at the third visit. Lenticular-sized erythematous plaques and hyperpigmented macules were found in the left infrascapular, left lateral, right and left lumbar, sacral, right and left anterior and posterior antebrachial regions.

The prognosis for this patient is good health, good function, and dubious sanitation.

DISCUSSION

The diagnosis of psoriasis vulgaris in this case was established based on history, dermatological examination, and PASI score assessment. Based on the history, there were complaints of reddish thickened skin with thick white scales accompanied by itching on the back, hands, and feet. The same condition had been observed 6 years previously. The dermatological examination found multiple erythematous plaques ranging in size from

nummular to plaque-like with thick white scales on the surface, as well as multiple lenticular to nummular erosions in the left infrascapular, left lateral, right and left lumbar, sacral, right and left anterior and posterior antebrachial, right and left patellar, right and left anterior and posterior cruciate, and right and left posterior genu regions. The Auspitz sign was positive, the wax drop phenomenon was positive, and the Koebner phenomenon was positive. This is consistent with the literature, which states that psoriasis is a chronic, often persistent papulosquamous disease. Classic psoriasis lesions typically appear as well-defined, reddish plaques with thick, whitish scales on the surface. These lesions vary in size, from small papules to plaques covering large areas of the body. Psoriasis lesions generally occur symmetrically on the extensor extremities, particularly on the elbows and knees, scalp, lumbosacral region, buttocks, and genitals. Nail abnormalities that can be found in psoriasis include nail discoloration, hyperkeratosis, subungual changes, nail pitting, and onycholysis. Additionally, psoriasis can exhibit the Auspitz sign, where the scales reveal shiny, reddish skin with hemorrhages when removed, and the wax drop phenomenon, where the scales turn white when scratched, resembling wax due to changes in the refractive index. Psoriasis can also occur at the site of trauma, a phenomenon known as the Koebner phenomenon.^{1,3,9}

The severity of psoriasis in this case was assessed using the PASI score. The patient's PASI score was 15.5, categorizing the severity of the psoriasis as severe. This is consistent with the literature, which states that the PASI is the most frequently used calculation to assess the extent of involvement by assessing the severity and erythema, lesion thickness, and scaling. A PASI score of 8 indicates mild psoriasis, while a PASI score >8-20 indicates moderate psoriasis, and a PASI score >20 indicates severe psoriasis.^{8,10,11} Abnormal laboratory test results are usually nonspecific in psoriasis patients; lipid profile disturbances can occur in approximately 15% of patients and elevated uric

acid levels in approximately 50% of patients. In this case, the patient's uric acid level was elevated, at 8.2 mg/dL (normal 5.7 mg/dL). According to the literature, this increase in serum uric acid primarily correlates with lesion expansion and disease activity. There is an increased risk of developing gouty arthritis. However, serum uric acid levels usually return to normal after therapy, as in this case, where the uric acid level after 1 month of therapy was 5.5 mg/dL. In this case, laboratory tests are also indicated as a routine assessment before administering systemic therapy, in this case cyclosporine. According to the literature, several laboratory tests that should be performed before administering methotrexate include kidney function tests, especially serum creatinine levels, liver function tests, electrolyte levels, especially potassium and magnesium, a complete blood count, glucose levels, and serum lipids.^{1,6,12}

The differential diagnosis of tinea corporis was ruled out because in tinea corporis, the lesions typically appear as well-defined erythematous plaques with a more active edge, known as central healing, and fungal structures are found on skin scrapings with 10% KOH. The differential diagnosis of parapsoriasis was ruled out because parapsoriasis is clinically characterized by fading erythematous plaques or salmon-colored patches with thin scales on the surface of the lesions. Lesions are usually distributed over the trunk and proximal extremities or in a bathing-suit distribution.⁷

This patient was given topical emollient therapy, namely Soft-U-derm® cream containing 10% carbonyl diamide or urea, applied twice daily to soften and loosen the scales. Oral methotrexate was administered to the patient because the lesions exceeded 30% of the body surface area. Methotrexate is an effective systemic drug for the treatment of psoriasis.^{1,5} Methotrexate is the first-line systemic treatment of choice for psoriasis with body involvement >30%.^{1,14} Methotrexate is a folic acid analog that competes with intracellular dihydrofolate reductase. Dihydrofolate reductase is required for

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