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MARKED CLINICAL IMPROVEMENT OF PSORIASIS VULGARIS WITH METHOTREXATE: A CASE REPORT WITH 75% PASI REDUCTION

Widya Gabriella Manurung[1]*, Kristo Alberto Nababan[2]
[1]Resident of Dermatology, Venereology, and Aesthetic Program, Faculty of Medicine, Universitas Sumatera Utara, Jl. Dr. Mansyur No.5, Padang Bulan, Medan Baru, Medan, Sumatera Utara 20155, Indonesia
[2]Department of Dermatology and Venereology, Adam Malik General Hospital, Jl. Bunga Lau No.17, Kemenangan Tani, Medan Tuntungan, Medan, Sumatera Utara 20136 Indonesia
*widyagmanurung@gmail.com

ABSTRACT
Psoriasis is an immune-mediated chronic, recurrent, systemic inflammatory disease induced by the combination of hereditary and environmental factors. The etiology of this disease involves many factors, including genetics, immunology, and the environment. Clinically, psoriasis vulgaris is characterized by the presence of reddish plaques with thick, symmetrically distributed squama mainly in the predilection areas. In moderate to severe cases, systemic therapy such as phototherapy, systemic anti-inflammatory agents, or biologic treatments is required, with topical therapy serving as an adjunct. Methotrexate is one of the effective systemic treatment options for severe psoriasis, either as monotherapy or in combination regimens. This case report aims to demonstrate the clinical efficacy of methotrexate in the management of moderate-to-severe psoriasis vulgaris. We report a case of a 37-year-old male presenting with scaly reddish skin thickening accompanied by itching all over the body. Clinical and histopathological examination confirmed the diagnosis of Psoriasis Vulgaris and treated with methotrexate. After a period of regular weekly methotrexate administration and monitoring, the patient achieved a 75% reduction in the Psoriasis Area and Severity Index (PASI), indicating significant therapeutic response. This case highlights the efficacy of methotrexate as a cost-effective and accessible treatment option for achieving substantial disease control in psoriasis vulgaris.

Keywords: methotrexate; psoriasis area severety index; psoriasis vulgaris; systemic therapy

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INTRODUCTION

Psoriasis vulgaris is a chronic, immune-mediated, systemic inflammatory skin disorder characterized by erythematous plaques covered with silvery scales (Gudjonsson et al., 2019). It affects approximately 2–5% of the global population and constitutes about 90% of all psoriasis cases (Parisi R et al., 2020). The disease exhibits a bimodal age distribution, with peak incidences at 15–30 years and 57–60 years of age. Early-onset psoriasis is often associated with HLA-Cw6 and a family history, and tends to present with more extensive and persistent lesions (Iskandar et al., 2021). Although the exact etiology and pathogenesis remain incompletely understood, psoriasis is known to arise from a complex interaction of genetic susceptibility, immune system dysregulation—particularly involving T lymphocytes—and environmental factors. These processes lead to hyperproliferation of keratinocytes and chronic inflammation of the skin, and in some cases, extracutaneous manifestations such as psoriatic arthritis may occur (Rendon et al., 2019 ; Boehncke et al., 2015)

Clinically, psoriasis vulgaris presents as well-demarcated, symmetrically distributed plaques, commonly located on the extensor surfaces of the elbows and knees, scalp, lumbosacral region, and buttocks (Parisi R et al., 2020 ; Boehncke et al., 2015). Beyond the physical manifestations, the disease imposes a significant psychological burden and is associated with a markedly reduced quality of life (Elmets et al., 2019). The primary goal of treatment is not

to cure the disease but to control its clinical manifestations and improve the patient's quality of life (Elmets et al., 2019). Approximately 70–80% of patients have mild to moderate disease, which can be effectively managed with topical agents. Moderate to severe cases, however, often require systemic treatments such as phototherapy, immunosuppressive agents, or biologic therapies, with topical therapies used adjunctively (Menter et al., 2019).

Methotrexate (MTX) remains one of the most widely used systemic therapies for moderate to severe psoriasis vulgaris. It can be used either as monotherapy or in combination with other treatments (van Huizen et al., 2022). Treatment response is commonly evaluated using the Psoriasis Area and Severity Index (PASI), with a 75% reduction in PASI score (PASI-75) considered a successful therapeutic outcome, while failure to achieve PASI-50 indicates poor response (Feldman et al., 2005). This case report aims to describe the significant clinical response observed in a patient with psoriasis vulgaris following methotrexate therapy, as evidenced by a 75% reduction in the PASI score, and to highlight the effectiveness and tolerability of methotrexate as a systemic treatment for moderate to severe psoriasis.

METHOD

This article is a case report study that provides diagnosis, clinical management, and patient follow up care. Data from this case report were obtained through anamnesis, physical examination, and supporting examinations conducted at Adam Malik General Hospital, Medan. The data obtained were then analyzed qualitatively and presented in narrative form. This case report discusses a 37-year-old male who experienced psoriasis vulgaris overlap. This case report will describe the clinical found, analyze individual case, and is expected to provide insights into clinical practice, especially regarding the use of MTX in clinical practice.

CASE REPORT

A 37-year-old Batak male, married, presented to the Dermatology and Venereology Polyclinic at H. Adam Malik General Hospital, Medan, with a chief complaint of widespread, pruritic, scaly, and erythematous skin thickening that had progressed over the past month. The symptoms had initially appeared one year prior as reddish patches with fine silvery scales localized to the hands and feet. Over time, the lesions gradually thickened and spread to the trunk, accompanied by itching. Five months before presentation, similar lesions had appeared on the scalp, face, and torso. In the past month, the plaques had become increasingly thick, with prominent scales and persistent pruritus, causing significant distress due to cosmetic disfigurement.

The patient had previously attempted self-medication with over-the-counter drugs from a pharmacy, without clinical improvement. He denied any history of systemic symptoms such as fever, sore throat, or cough. There was no family history of similar skin conditions. The patient reported experiencing severe psychological stress due to job loss related to his skin condition. On physical examination, the patient was alert (compos mentis), in good general condition, with a body weight of 80 kg and a height of 177 cm. Vital signs were within normal limits: blood pressure was 110/70 mmHg, pulse rate was 82 bpm, respiratory rate was 20 breaths per minute, and body temperature was 36.7°C. Nutritional status was adequate. Dermatologic examination revealed multiple well-demarcated erythematous plaques with thick silvery-white scales. Lesions were noted on the face, forehead, and scalp; anterior and posterior thoracic and abdominal regions; lumbar area; bilateral upper extremities (brachii, antebrachii, and manus); lower extremities (genu and cruris regions bilaterally); and dorsum of both feet (Figure 1).

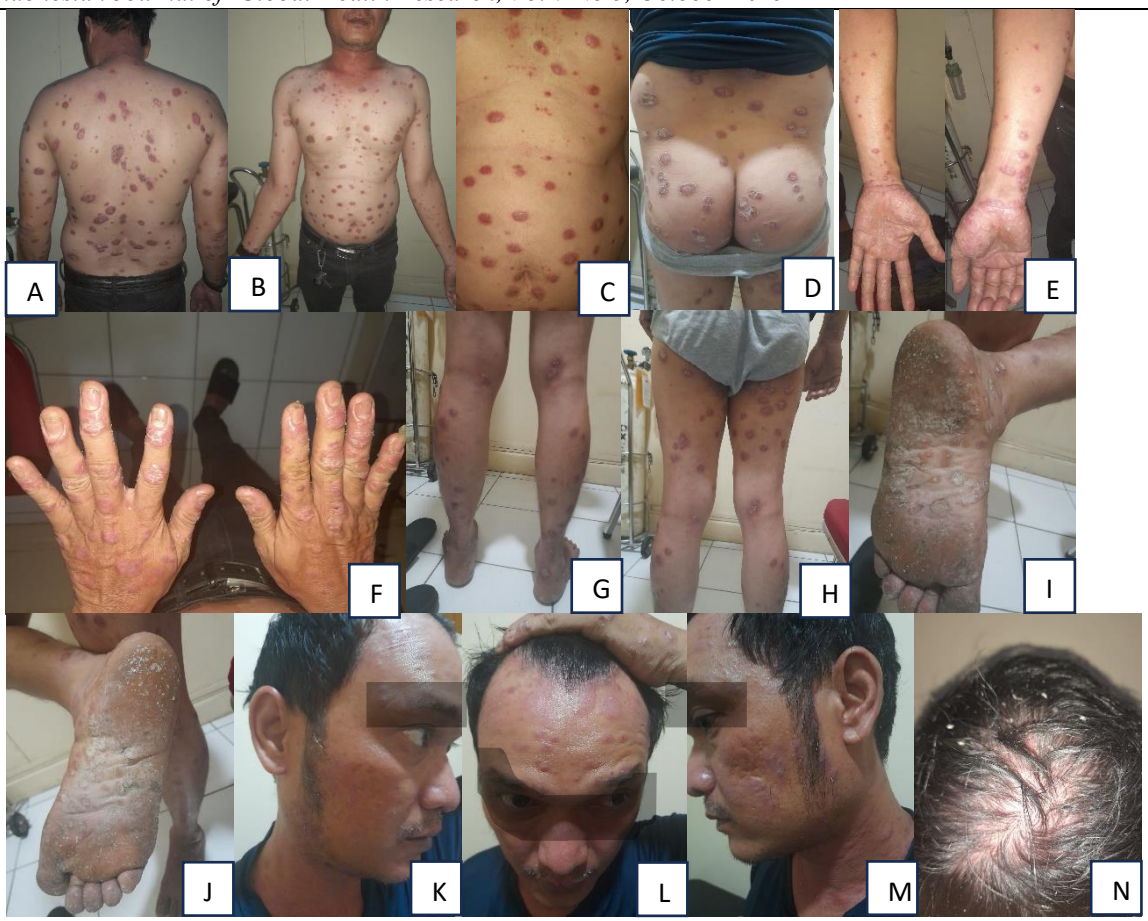

Figure 1. Vulgaris. (A–D) Well-demarcated erythematous plaques with thick silvery scales on the anterior and posterior thoracic and abdominal regions, and lumbar area. (E–F) Similar lesions on the bilateral upper extremities including brachii, antebrachii, and manus regions. (G–J) Erythematous plaques with silvery scales on the genu and cruris regions of both legs. (K–N). Involvement of the facial region, including os frontalis and scalp, with confluent plaques and characteristic scaling.

Upon lesion manipulation, a positive Auspitz sign and wax spot phenomenon were observed. The Psoriasis Area and Severity Index (PASI) score was calculated to be 55.7, indicating severe disease. Laboratory investigations—including complete blood count, liver function tests (SGOT, SGPT), renal function tests (urea, creatinine), and fasting blood glucose—were all within normal limits. A skin biopsy was performed from a plaque on the patient's lower back to confirm the clinical diagnosis. Macroscopically, the specimen consisted of a single core biopsy tissue with overlying skin, whitish-grey in color, with an uneven surface and firm consistency. The biopsy tissue measured approximately 0.6 × 0.2 × 0.2 cm, and the skin portion measured 0.3 × 0.2 × 0.1 cm.

Histopathological examination revealed features consistent with psoriasis vulgaris. The epidermis showed marked hyperkeratosis, acanthosis, and regular elongation of the rete ridges (psoriasiform hyperplasia), along with focal thinning of the suprapapillary plates. The dermis consisted of fibrous connective tissue, and a dense neutrophilic inflammatory infiltrate was observed in the subepidermal region. No evidence of dysplasia or malignancy was found. These findings supported the clinical impression of psoriasis vulgaris.

The differential diagnoses considered included psoriasis vulgaris, guttate psoriasis, and seborrheic dermatitis. Based on the clinical history, physical findings, and supporting investigations, a definitive diagnosis of severe psoriasis vulgaris was established. The patient was treated with methotrexate 7.5 mg/week (administered as 3 × 2.5 mg doses), oral cetirizine 10 mg once daily, and topical therapy consisting of desoximetasone 0.25% combined with salicylic acid 3% twice daily on the body, hands, and feet; hydrocortisone 1% cream twice

daily for facial lesions; and a moisturizing lotion applied twice daily. The patient was advised to avoid scratching the lesions, to adhere strictly to the prescribed treatment regimen, and to return for a follow-up after one month.

At the second follow-up, after two months of treatment, the patient reported a significant improvement in symptoms. He occasionally experienced mild itching, particularly in the lower extremities. Dermatological examination revealed multiple hyperpigmented macules on the facial and frontal regions, as well as on the abdomen, posterior thorax, and both upper and lower extremities (Figure 2). The PASI score had markedly decreased to 4.2. The treatment regimen was continued with methotrexate 5 mg/week (administered as 2 × 2.5 mg doses), oral cetirizine 10 mg once daily, and a moisturizing lotion applied twice daily. The patient was advised to avoid scratching the lesions, to use the medications as prescribed, and to return for follow-up in one month. The prognosis of this patient is quo ad vitam dubia ad bonam, quo ad fuctionam dubia ad bonam, and quo ad sanationam dubia ad malam.

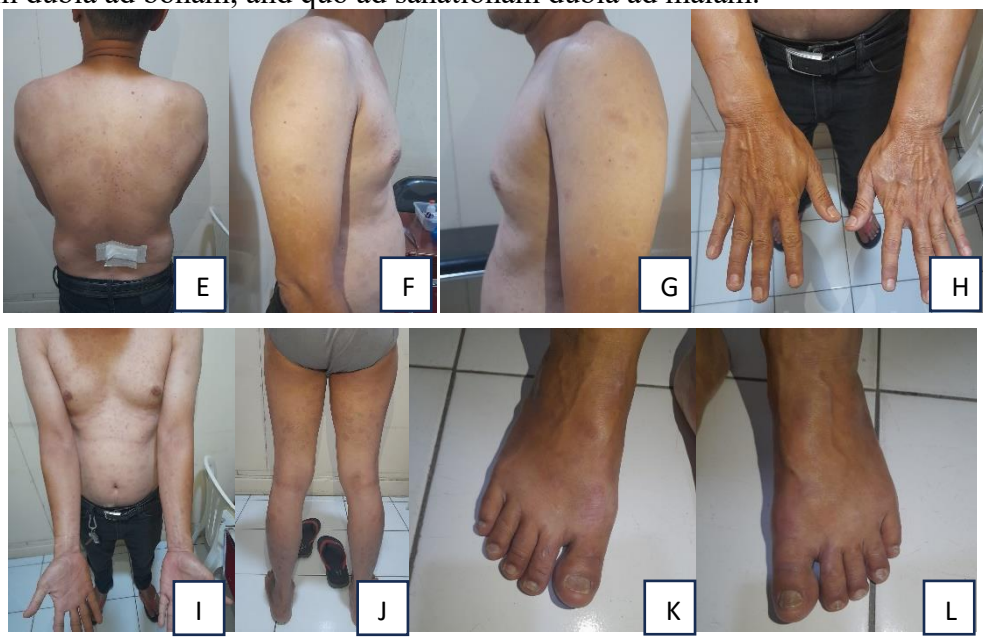

Figure 2. Post-Treatment Improvement: Residual Hyperpigmented Macules Following Methotrexate Therapy. (A–C) Hyperpigmented macules in the facial and frontal regions indicating resolving psoriatic lesions.(D–E) Similar macular changes seen in the abdominal and posterior thoracic areas. (F–L) Diffuse post-inflammatory hyperpigmentation on both upper and lower extremities after two months of systemic methotrexate therapy, with complete resolution of erythema and scaling.

DISCUSSION

Psoriasis vulgaris is characterized by erythematous plaques with thick scales, typically distributed symmetrically on extensor surfaces such as the elbows, knees, lumbosacral region, buttocks, and genital areas. The condition can manifest at any age, with bimodal peaks at 20–30 years and 50–60 years of age (Gudjonsson & Elder, 2019). Approximately 3% of the global population is affected, with an equal sex distribution in adults. Besides genetic predisposition, environmental factors—including trauma, infection, stress, medications, and immune dysregulation—contribute to its pathogenesis; in this case, psychological stress was identified as a significant risk factor (Parisi et al., 2020; Rendon & Schäkel, 2019).

Psoriasis is a chronic, relapsing condition manifesting as sharply demarcated erythematous patches with coarse scales. Diagnostic clinical signs include the “wax-drop” phenomenon and Auspitz sign, both considered characteristic, whereas the Koebner phenomenon is less common (present in ~47% of cases) (Gudjonsson & Elder, 2019). The wax-drop phenomenon occurs when scaled lesions are gently scraped, resulting in a silver, candle-like sheen, and is attributed to changes in refractive index; the Auspitz sign produces pinpoint bleeding due to

papillary vessel exposure. Trauma, such as from scratching, may induce new psoriatic lesions via the Koebner phenomenon after approximately three weeks (Elmets et al., 2019). In this patient, both the wax-drop and Auspitz signs were present.

Differential diagnoses included guttate psoriasis and seborrheic dermatitis. Guttate psoriasis typically presents acutely with widespread 0.3–0.5 cm erythematous papules and a history of preceding streptococcal infection, along with elevated neutrophil counts and anti-streptolysin O titers, and often resolves within weeks (Iskandar et al., 2021). Seborrheic dermatitis, in contrast, is characterized by oily, yellowish plaques with mild to moderate erythema, commonly affecting areas rich in sebaceous glands; these features differ from the extensor predilection and trauma-induced Koebner pattern seen in psoriasis vulgaris (Elmets et al., 2019).

Severity in psoriasis is commonly quantified using the Psoriasis Area and Severity Index (PASI), which ranges from 0 to 72. It evaluates four body regions (head/neck, upper limbs, trunk, lower limbs) based on area involvement and severity of erythema, induration, and scaling. Scores < 5, 5–10, and > 10 correspond to mild, moderate, and severe disease, respectively (Feldman & Krueger, 2005; Menter et al., 2019). Management aims to control symptoms rather than achieve cure, with treatment tailored to body surface area involvement and severity. Lesions covering $> 30\%$ of the body typically warrant a combination of topical agents, phototherapy, the Goeckerman regimen, and systemic treatments. Systemic therapies—such as methotrexate, acitretin, and biologics—are indicated in recurrent, active, or refractory moderate-to-severe psoriasis. Second-line agents include fumaric acid esters, cyclosporine, hydroxyurea, 6-thioguanine, and sulfasalazine. Phototherapy options include narrowband UVB and broadband UVB as first-line modalities, with PUVA, excimer laser, and climatotherapy as alternatives (Menter et al., 2019; van Huizen et al., 2022).

Methotrexate, a folic acid antagonistic derivative of aminopterin, exhibits anti-inflammatory, antiproliferative, and immunosuppressive properties. It can be administered orally, intramuscularly, subcutaneously, or intravenously. Its primary mechanism involves inhibiting dihydrofolate reductase—thereby interfering with purine and pyrimidine synthesis—and thymidylate synthase, resulting in reduced DNA synthesis (Rendon & Schäkel, 2019; van Huizen et al., 2022). Methotrexate is effective for long-term management of severe psoriasis, including psoriatic erythroderma and pustular variants. Initiation commonly begins at 2.5 mg weekly, titrated to a typical dose range of 10–25 mg/week, with a maximum of 25–30 mg/week (Gudjonsson & Elder, 2019; van Huizen et al., 2022). Clinical trials show that over 75% of patients can achieve at least a 50% reduction in PASI (PASI-50) with this regimen (Elmets et al., 2019). Achieving PASI 75 is considered a benchmark for successful psoriasis therapy and indicates substantial disease control and improvement in quality of life (van Huizen et al., 2022; Menter et al., 2019). This outcome underscores the effectiveness of methotrexate as a first-line systemic agent in managing severe psoriasis and aligns with existing evidence on its clinical efficacy and cost-effectiveness. Topical treatments are used adjunctively to improve outcomes in extensive disease (Menter et al., 2019).

In the present case, the patient was diagnosed with severe psoriasis vulgaris, with an initial PASI score of 55.7. After two months of systemic therapy with methotrexate, the patient showed a significant clinical improvement, achieving a PASI score of 4.2—reflecting a 75% reduction in disease severity (PASI 75). Achieving PASI 75 is considered a benchmark for successful psoriasis therapy and indicates substantial disease control and improvement in quality of life (van Huizen et al., 2022; Menter et al., 2019). This outcome underscores the effectiveness of methotrexate as a first-line systemic agent in managing severe psoriasis and aligns with existing evidence on its clinical efficacy and cost-effectiveness. The patient's prognosis was considered fair with respect to life expectancy and functional status, but

guarded regarding complete remission. Although psoriasis is not life-threatening, it can severely impact occupational functioning, social life, and overall quality of life, and may lead to complications if inadequately treated (Elmets et al., 2019).

CONSLUSION

This case report highlights the effectiveness of methotrexate as a first-line systemic treatment for severe psoriasis vulgaris. The patient demonstrated marked clinical improvement, achieving a 75% reduction in the Psoriasis Area and Severity Index (PASI 75) after two months of therapy. This outcome not only reflects a substantial reduction in disease activity but also supports the use of methotrexate as a cost-effective and practical therapeutic option in resource-limited settings. The clinical response observed further underscores the importance of early systemic intervention in severe cases and adherence to individualized treatment plans to improve patient quality of life.

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