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Case Report Open Access

Successful Treatment of Severe Psoriatic Arthritis and Psoriasis with Double Filtration Plasmapheresis

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Abstract

Psoriatic arthritis (PsA) is a chronic, progressive, inflammatory arthropathy associated with psoriasis. Traditional disease modifying anti-rheumatic drugs (DMARDs) have shown inconsistent and unsatisfactory results. Treatment with biological agents has shown different results. Despite the evident efficacy of biologic agents for psoriasis and psoriatic arthritis, there is an increase in psoriasis following biologic agents' therapies. Psoriasis has no permanent cure and represents a lifelong burden for affected patients. We report herein a successful therapeutic approach for PsA with widespread psoriasis using double filtration plasmapheresis (DFPP) in a 25-year-old female patient. Two months after the first DFPP treatment, a remarkable normalization of the clinical appearance was achieved. During the 3 years follow-up, the patient has had no detectable disease, and a sustained clinical remission has been maintained for 2 years after the interruption of therapy. DFPP therapy led to the complete regression of the severe disease. Therefore, we consider the therapy as promising for treatment of PsA.

Keywords: Double filtration plasmapheresis; Psoriatic arthritis; Psoriasis

Introduction

PsA is progressive, erosive, and destructive, resulting in marked impairment of the activities of daily living and poor quality of life. Patients with PsA are usually affected with psoriasis before signs of joint disease have developed. Although not life-threatening, psoriasis substantially affects health-related quality of life and has negative psychological and social implications. A comparative study reported reduction in physical functioning and mental functioning comparable with these seen in cancer [1]. Traditional disease modifying anti-rheumatic drugs, have shown inconsistent and unsatisfactory results. Treatment with biological agents has shown different results. Despite the evident efficacy of biologic agents for psoriatic arthritis [2,3] and psoriasis [4], there is an increase in psoriasis following biologic agents therapies [5-8]. Psoriasis has no permanent cure and represents a lifelong burden for affected patients. We report herein the first case of a successful treatment of PsA with widespread psoriasis using DFPP, its major mode of action is rapid depletion of specific disease-associated plasma factors [9].

Case Report

The patient, a 25-year-old woman, had a 4-year history of psoriasis and a 2-year history of tender and swelling joints. She was taking methotrexate and leflunomide for treatment. The therapy did not result in sufficient relief of joint pain and lesions. Her daily living activities were severely affected by the dual burden of widespread psoriatic skin lesions and joint involvement.

On admission, her body temperature was 36.2, heart rate 75/min, blood pressure 110/80 mmHg. Her knee joints and left ankle joint showed marked swelling and tenderness and her great toe of the left foot showed a sausage-shaped swelling, but no sign of muscular weakness. Her arms, trunk and legs showed large areas of raised, well-demarcated, erythematous plaques with adherent silvery scales, and pustules was developed on erythematous areas on the legs (Figure 1A). There was also mild limitation in the patient's scalp. Examination of the chest and abdomen was unremarkable.

Laboratory findings were as follows: CRP was 102 mg/l (normal range 0-8 mg/l), ESR 61 mm/h (normal range 0-20 mm/h), HLA–B27 and rheumatoid factor were negative. Based on these findings, the patient was diagnosed as having psoriatic arthritis combined with psoriasis. In this study, the DLQI score was 30, the PASI score was 55, and the HAQ score was 1. These represented severe disease. 12-month treatment with MTX and LEF did not result in sufficient relief of joint pain and lesions. Therefore, we decided to treat the patient with DFPP. DFPP was performed once a week for 2 sessions. For long-term treatment, patients continued to take the same doses of medications: LEF 10 mg, two times daily, plus MTX 15 mg orally once weekly. Most interestingly, the patient showed significant improvement in tender joints and swollen joints 1 day after the first DFPP, CRP 58 mg/l, ESR 3 mm/h. Two days after the second DFPP, the patient experienced complete relief of joint pain and swelling, and HAQ score was 0. The level of CRP was 9. The patient showed significant improvement in the skin lesions at month 1 (Figure 1). After 2 months, a remarkable normalization of the skin was achieved (Figure 1), DLQI score and PASI score were 0. The patient didn't take any medicine after a 1-year MTX - LEF therapy period. During the 3 years follow-up, the patient has had no detectable disease, and a sustained clinical remission has been maintained for 2 years after the interruption of therapy (Figure 2).

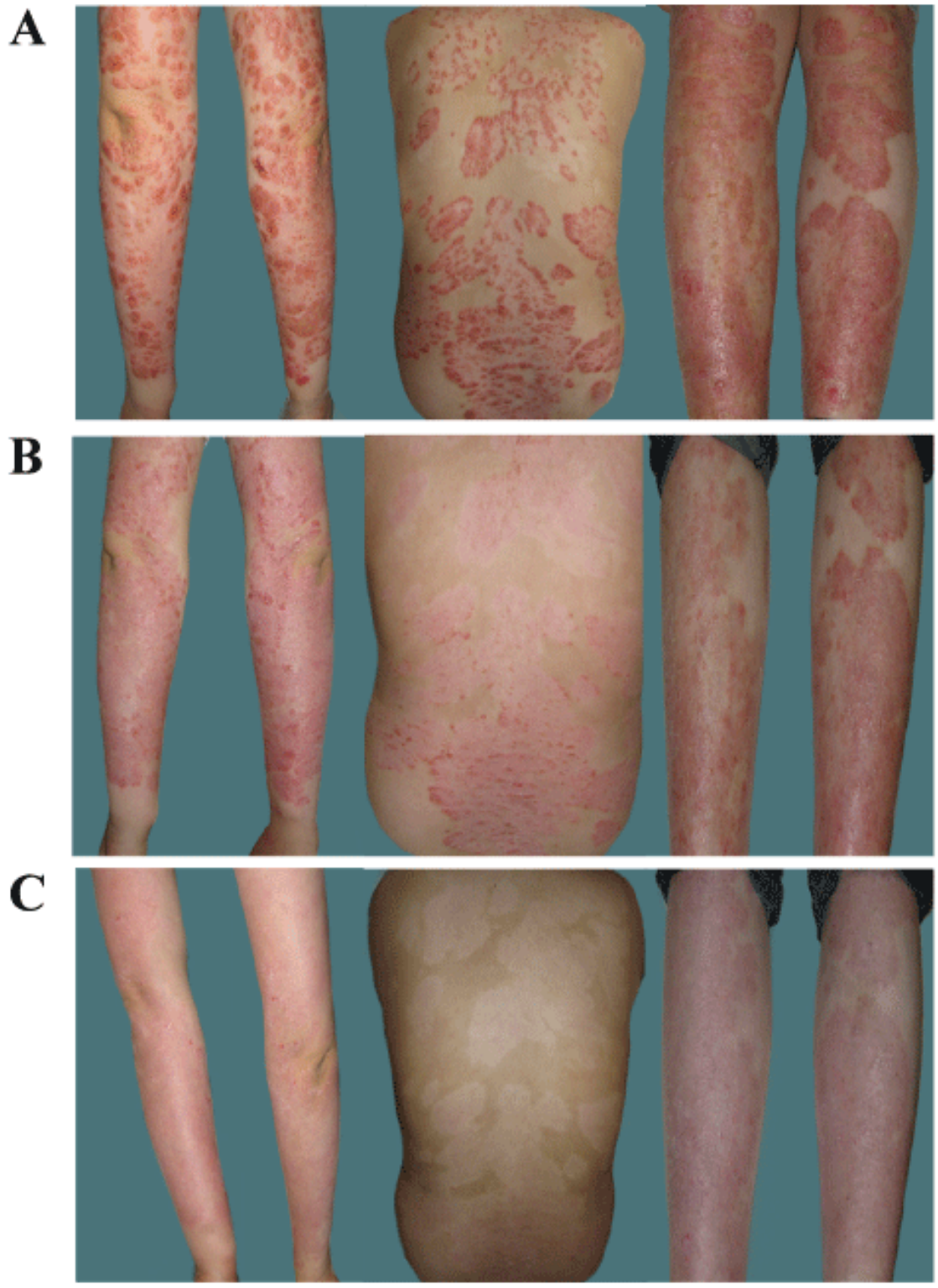

Figure 1: (A) Psoriasis before treatment with double filtration plasmapheresis (DFPP). Severe widespread psoriasis on patient' arms, trunk and legs (left to right). **(B)** One month after the first DFPP, the patient showed significant improvement in the skin lesions. **(C)** Two months after the first DFPP, showing complete remission of psoriasis.

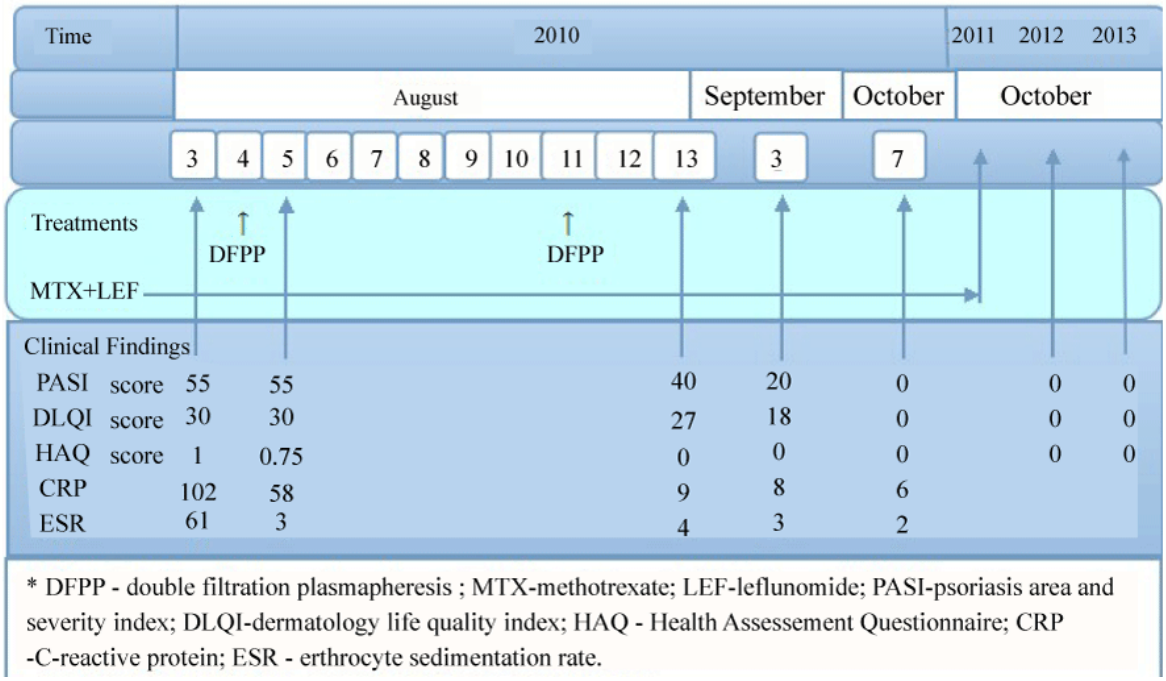

Figure 2: Responses to double filtration plasmapheresis therapy in the patient with severe psoriatic arthritis and psoriasis: improvement in PASI, DLQI, HAQ, CRP and ESR at different time points.

Discussion

By definition, all patients with PsA have psoriasis. Skin involvement can occur anywhere on the body. Manifestations of PsA contribute to reduced physical and psychosocial health-related quality of life. The health-related quality of life was assessed with the dermatology life quality index (DLQI) questionnaire. The DLQI is a self-reported questionnaire to measure how much a skin problem has affected the life of the patient, covering symptoms and feelings, daily activities, leisure, work/school, personal relationships and treatment. A DLQI score of 21-30 is considered as extremely large effect [10]. The severity of psoriasis was assessed with the psoriasis area and severity index (PASI) [11]. The severity of psoriasis according to the PASI was defined as mild (PASI<7), moderate (PASI 7-12), and severe (PASI>12). The health assessment questionnaire (HAQ) is commonly used to assess physical function in PsA.

PsA is thought to be an immune-mediated disease with a complex pathophysiology and a strong genetic background [12-14]. A variety of cytokines, autoantibodies and immunoglobulins have been implicated in the pathogenesis of PsA and psoriasis [14-16]. A biologic agent could target only a single inflammatory mediator and may show unsatisfactory results [17,18]. Double filtration plasmapheresis selectively removes high-molecular-weight substances, such as immunoglobulins, autoantibodies, immune complexes, acute-phase reactant proteins and cytokines [9,19-21]. Double filtration plasmapheresis (DFPP) was conducted by application of a double-filtration technique with a membrane plasmapheresis apparatus (Plasauto iQ, Asahi Medical Co., Tokyo, Japan). OP-08W and EC-30W were used as plasma separator and plasma fractionator. In DFPP, a first filter was used to separate plasma from blood (plasma separator) and a second to filter larger molecules from the plasma (plasma fractionator). Disease activity of the patients with autoimmune diseases could be controlled completely following the rapid depletion of specific disease-associated plasma factors [20-27].

To our knowledge, treatment of PsA with a DFPP therapy has not previously been reported. In the present case report, in addition to the effect on widespread skin lesions after 2 months, the complete resolution of swollen and tender joints 9 days after initiation of DFPP therapy is remarkable. Of particular note, a sustained clinical remission has been maintained for 2 years after the interruption of therapy. DFPP therapy led to the complete regression of the severe disease.

A good initial response and a sustained response to DFPP therapy were all observed. We consider a DFPP therapy to be promising in PsA.

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