

CLINICAL IMPROVEMENT OF A PATIENT WITH EXFOLIATIVE DERMATITIS AND COMPLICATIONS: A CASE REPORT

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ABSTRACT

Exfoliative dermatitis, or erythroderma, is a severe inflammatory skin syndrome characterized by erythema and desquamation covering 90% of the body's surface. Previous studies reported 83 cases of erythroderma at Dr. Soetomo Hospital from 2011 to 2014. In Portugal, erythroderma incidence is 9.4 cases per year, predominantly affecting individuals aged 41 to 61. The most common causes of erythroderma are psoriasis and dermatitis. Case: A 55-year-old woman presented to the emergency department of Rajawali Citra Hospital on September 5, 2023, with complaints of abdominal pain, vomiting, and cough, accompanied by itchy, dry skin on her face, arms, and legs. The patient had a history of erythroderma for one year. Dermatological examination revealed erythematous patches with scales on the left supraorbital and nasal areas and xerosis on the upper extremities, abdomen, and lower extremities. The patient was diagnosed with exfoliative dermatitis and showed clinical improvement with a treatment regimen of 10 mg loratadine once daily and topical desoximetasone ointment twice daily. Erythroderma treatment depends on the underlying condition. Essential therapy includes petrolatum, emollients, or low-potency topical steroids, which help maintain skin barrier function and reduce acute inflammation. Antihistamines can be used to alleviate itching and anxiety. A well combination drugs therapy shows clinical improvement on erythroderma performance.

Keywords: Exfoliative Dermatitis, Erythroderma

INTRODUCTION

Generalized exfoliative dermatitis, erythroderma, is a severe inflammatory skin syndrome characterized by whole-body erythema and desquamation covering 90% of the body surface. Erythroderma can be a primary condition when the cause is unknown or secondary, arising from a specific disease.

In a retrospective study from Portugal, the incidence of erythroderma is reported to be 9.4 cases per year. Previous research conducted at Dr. Soetomo Hospital from 2011 to 2014 showed 83 cases of erythroderma. Erythroderma is more common in men, with a male-to-female ratio of 2-4:1, and often manifests in older adults, with an average age range of 41 to 61 years. The onset of erythroderma depends on the underlying etiology, with the most common because being pre-existing dermatoses (75.0%), including psoriasis (41.3%) and dermatitis

(17.4%). According to a study by Snigdha O et al., the most frequent type of dermatitis contributing to erythroderma includes contact dermatitis (22%), allergic contact dermatitis (5.5%), airborne contact dermatitis (3%), seborrheic dermatitis (3%), and atopic dermatitis (5.5%). Other causes include drug reactions, malignancies, systemic diseases, infections, and idiopathic conditions. Therefore, erythroderma often has a differential diagnosis of psoriasis, which is the leading cause of erythroderma.

Various factors affect the clinical condition and prognosis, including patient age, underlying disease etiology, medical history, erythroderma onset, and timing of therapy initiation. The pathogenesis of erythroderma is linked to cytokine interaction and cellular adhesion molecules. It is associated with interactions between IL-1, IL-2, IL-8, ICAM-1, TNF, and interferon-gamma. These interactions increase epidermal cell division and mitotic rate, causing a rise in germinative cell count, reduced keratinocyte transit time in the epidermis, and subsequent exfoliation. Retained skin scales contain amino acids, proteins, and nucleic acids typically lost during desquamation. The pathogenesis of atopic dermatitis involves increased IgE production, where high IgE levels in erythroderma are linked to allergies, further inducing excessive interferon-gamma secretion. Moreover, erythroderma can result in metabolic and physiological complications, including fluid and electrolyte imbalance, heart failure, acute respiratory distress syndrome, and secondary infections.

CASE STUDY

A 55-year-old, retired woman presented to the Emergency Department at Rajawali Citra Hospital in Bantul on September 5, 2023, with complaints of abdominal pain, vomiting, and cough, along with itchy, dry, and flake skin on her face, neck, chest, upper arms, and legs. The area around her eyebrows was still red, and her arms and legs skin was dry. The patient regularly attended monthly dermatology appointments, reporting that her skin was no longer itchy, the flake had started to improve, and no new areas of skin were flake.

In May 2022, the patient visited the hospital complaining of itching and flake skin on her neck, upper chest, forearms, and legs. She enjoys gardening, which may have increased her exposure to allergens. A week prior, she had experienced itching and sought treatment at a local clinic, where she received oral medication and ointment, though she was unaware of their names. Later, she self-administered methylprednisolone 4 mg and cetirizine 10 mg, with slight improvement, prompting her to visit Rajawali Citra Hospital. She was diagnosed with Photoallergic Contact Dermatitis (PCD) and received treatment with methylprednisolone 16 mg once daily for three days, Mofacort[®] twice daily, and desoximetasone ointment. Biocream[®] was applied to her arms and legs twice daily. The patient reported improvement and did not return for follow-up. She also had a history of diabetes mellitus, controlled with metformin 500 mg once daily, and attended regular follow-ups for diabetes at the Internal Medicine Clinic at Rajawali Citra Hospital.

In March 2023, the patient returned to the Dermatology and Venereology Clinic at Rajawali Citra Hospital with similar complaints of itching, redness, and flake skin all over her body, which had recurred over the past four days. The itching, affecting her head, face, neck, chest, arms, and legs, was continuous and disrupted her daily activities due to pain. She was

Nathania Christabella^{1*}, Sugih Primas Adjie², Nurwestu Rusetiyanti³, Husna Raisa⁴, Nungki Anggorowati⁵ diagnosed with exfoliative dermatitis and treated with methylprednisolone 62.5 mg intravenous injections every 24 hours, cetirizine 10 mg once daily, mometasone 1% cream once daily for her face, desoximetasone ointment and Biocream[®] 10 grams twice daily for her body, Carmed[®] 10% 40 grams, and Caviplex[®] once daily in the morning. A week later, at follow-up, her symptoms had improved; there was no new flake, though her face, neck, chest, arms, and legs remained red. Her treatment was adjusted, replacing intravenous methylprednisolone with 8 mg oral doses twice daily after meals.

In early May 2023, the patient revisited the emergency department with neck stiffness, lower abdominal pain, cough, and dry skin over her entire body. She also had yellow, crusted sores on her legs that were painful and itchy, leading to her admission under the joint care of the internal medicine and dermatology departments with a diagnosis of erythroderma. During her hospitalization, she received intravenous methylprednisolone 31.25 mg every 24 hours, loratadine 10 mg once daily, desoximetasone ointment twice daily, and fusidic acid cream twice daily on her leg wounds. After three days, her condition improved, and she was discharged. At her follow-up, she reported improved skin dryness, absence of itching, some remaining flake on her arms, and no new wounds on her legs. She was diagnosed with seborrheic dermatitis and given a compounded cream containing 1% salicylic acid, 3 grams of glycerin, 30 grams of desoximetasone, and 30 grams of Vaseline for twice-daily application over her entire body, along with 10 mg loratadine once daily.

In June 2023, the patient reported recurrent facial itching and redness, with dry, red, and slightly flake skin on her arms, chest, and legs. Her treatment was continued, and she was referred to UGM Academic Hospital for a skin biopsy. Histopathological examination (Figure 1) revealed features of spongiotic dermatitis, consistent with either allergic contact dermatitis or seborrheic dermatitis.

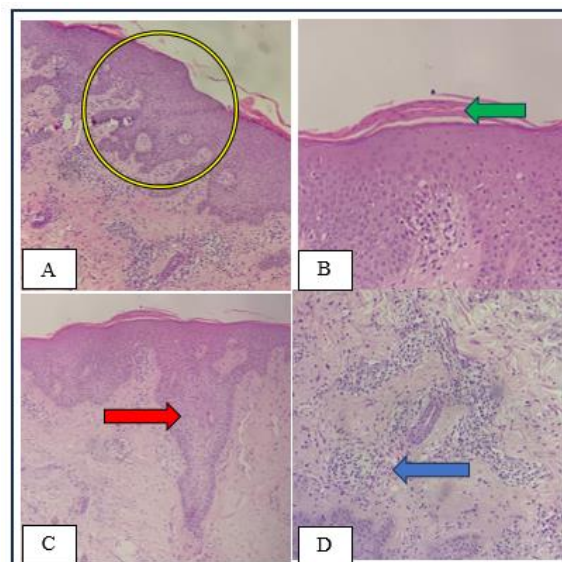


Figure 1. A. Psoriasiform pattern with elongation of rete ridges (yellow circle). B. Epidermis with parakeratosis (green arrow). C. Epidermis with acanthosis (red arrow). D. Dermis with infiltration of lymphocytes, plasma cells, and eosinophils (blue arrow).

In July 2023, the patient reported that her face remained red but was no longer itchy,

and her body, arms, and legs had no redness, though her skin felt dry. She received treatment with triamcinolone 12 mg, cetirizine 10 mg once daily, mometasone cream twice daily on her face, and a compounded cream (desoximetasone and Vaseline) applied twice daily over her body. She noted continued improvement and attended biweekly follow-ups.

The current dermatological examination showed erythematous patches with scales on the left supraorbital and nasal areas (Figure 2A) and xerosis on the upper extremities, abdomen, and lower extremities (Figures 2B-D).



Figure 2. (A) Erythematous patches with scales on the left supraorbital and nasal regions. (B) Abdomen showing generalized xerosis. (C) Upper extremities with xerosis on both the left and right palms. (D) Lower extremities with xerosis on both the right and left feet.

Based on the patient's history, physical examination, and supporting tests, she was diagnosed with exfoliative dermatitis, showing clinical improvement, with a differential diagnosis of allergic contact dermatitis (ACD). The patient received oral and topical treatment with 10 mg loratadine once daily and desoximetasone ointment applied twice daily.

Results and Discussion

The patient's gardening hobby involves significant sun exposure, making her prone to sunburn or skin inflammation, such as allergic photo contact dermatitis. This condition can cause eruptions such as erythema, scaling, and desquamation in sun-exposed areas. In cases where erythema and desquamation affect more than 90% of the body surface, a diagnosis of erythroderma or exfoliative dermatitis can be established, consistent with research by Sheikh F. et al., which found that the most common causes of erythroderma are extensions of psoriasis and dermatitis.

The patient complained of itching on her arms and legs during the examination. Dermatological findings revealed erythematous patches with scales on the left supraorbital area and xerosis across her limbs. The most common symptom of erythroderma is itching. Early lesions of erythroderma begin with erythematous patches that spread, eventually affecting nearly all skin areas. Within 2 to 6 days of onset, varied scaling may appear. The skin becomes red, dry, and warm. During the acute phase of erythroderma, lesions are characterized by widespread scaling and crusting, while in the chronic phase, the scales are more minor and dry. The type of scaling may suggest the underlying etiology: fine scales are typically found in dermatitis, crusted scales in immunobullous disease, exfoliative scales in drug reactions, and bran-like scales in seborrheic dermatitis. In the chronic phase of erythroderma, lesions may evolve into crusted erosions and secondary lichenification from scratching and may also present as hyperpigmentation or hypopigmentation. This patient's dermatological findings align with erythroderma, showing fine scaling indicative of dermatitis as the underlying cause.

Diagnosis can be established through history-taking, physical examination, and additional tests. Histopathological examination from a skin biopsy is a diagnostic tool used to identify the underlying etiology of erythroderma. Histopathological findings in erythroderma typically show hyperorthokeratosis (thickening of the keratin layer), acanthosis (epidermal thickening), and chronic perivascular inflammatory cell infiltration with or without eosinophilia. In allergic contact dermatitis, histopathology may show perivascular lymphocytic infiltration, dermal edema, epidermal spongiosis, and exocytosis in the dermis. Persistent lesions in chronic ACD may reveal reactive changes in the epidermis (acanthosis, hyperkeratosis, parakeratosis) with minimal spongiosis and a mixed inflammatory cell infiltrate in the dermis. The histopathological sample in this case, taken in June 2023, showed features consistent with erythroderma and ACD. Additional tests, such as a patch test to identify potential allergens, are recommended to confirm ACD.

Erythroderma is characterized by generalized erythema involving more than 90% of the body surface, sometimes accompanied by erosions, crusting, and changes in hair or nails. The patient's clinical presentation has shown improvement, with remaining lesions on the supraorbital area and dryness on all four extremities. With lesions covering less than 90% of the body, the diagnosis based on history, physical examination, and histopathology is exfoliative dermatitis with clinical improvement and allergic contact dermatitis as a differential diagnosis.

Type IV hypersensitivity is the reaction in ACD. This involves two phases: sensitization, where an external substance penetrates the skin and binds to skin proteins, forming an antigen complex that induces an inflammatory response by activating the innate immune response via keratinocyte-derived cytokines such as IL-1 α , IL-1 β , TNF- α , IL-8, and granulocyte-macrophage colony-stimulating factor. The antigen is presented by antigen-presenting cells (APCs), such as Langerhans cells and dendritic cells, which migrate to the lymph nodes, where antigen-specific T cells (Th1, Th2, Th17, and regulatory T cells) are activated, proliferate, and circulate in the bloodstream. Naive T cells recognize the allergen molecules, inducing effector and memory T cell formation. IL-1 and TNF- α also play a role in erythroderma pathogenesis by increasing epidermal cell proliferation.

Erythroderma is a dermatological emergency, with severity and underlying disease

affecting its management. Primary treatment includes maintaining body thermoregulation, such as by applying warm compresses. Petrolatum, emollients, or low-potency topical steroids can increase patient comfort. Petrolatum helps combat skin dryness by maintaining stratum corneum hydration and enhancing desquamation. A moist stratum corneum can better absorb topical therapy, and desquamation makes the stratum corneum thinner, facilitating the migration of topical therapies. Steroids aim to reduce acute inflammation in patients, addressing erythema and pruritus. Antihistamines may also be used to reduce itching and anxiety. Key considerations in erythroderma therapy include adequate nutrition and fluid intake. Initial therapy when the patient was first diagnosed with erythroderma (March 2023) included methylprednisolone 8 mg twice daily, cetirizine 10 mg once daily, mometasone 1% cream once daily for the face, desoximetasone ointment and Biocream[®] 10 grams twice daily for the entire body, Carmed[®] 10% 40 grams twice daily, and Caviplex[®] once daily until clinical improvement was noted. Treatment for contact dermatitis depends on the phase: acute phases are managed with topical/systemic steroids and antihistamines, while chronic phases are managed with moisturizing cream for dry skin and added topical steroids. However, the primary approach is the protection and avoidance of allergenic triggers. In this case, from the emergency department visit in September 2023, the patient was treated with 10 mg loratadine once daily and desoximetasone ointment twice daily. Desoximetasone is a medium-potency corticosteroid with anti-inflammatory and anti-mitotic effects.

The patient continues to attend dermatology and venereology clinic follow-ups at Rajawali Citra Hospital, Bantul, every two weeks to a month.

Conclusion

We report a case of exfoliative dermatitis that demonstrated clinical improvement with a well-regulated combination therapy

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First Publication Right:

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