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Case Report

Steroid-induced rosacea in systemic lupus erythematosus

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Abstract Rosacea is identified with erythema of the central face with flushing, papules, pustules, and telangiectasia. It is induced by chronic, repeated exposure to triggers such as sunlight, temperature, exercise, menopausal flushing, cosmetics, medications, spicy food, emotions, liquor, and topical irritants. A 59-year-old female visited a dermatology and venereology outpatient clinic with redness and flushing all over the facial area for more than one year which is worsening. The previous diagnosis was systemic lupus erythematosus, treated with topical corticosteroids for the last one year, but there was no clinical improvement. The patient was currently diagnosed with rosacea based on the erythematous facial lesion and multiple discrete telangiectasias. The lesion improvement was shown after one month of treatment with topical metronidazole 0,75%, topical nicotinamide 4%, and topical tretinoin 0,025%, and tapered off the use of topical corticosteroids. Rosacea commonly mimics many diseases, including photosensitivity in lupus erythematosus. The initial usage of steroids results in clearance of the primary lesion. However, continuous usage causes atrophy of epidermis, degeneration of dermal structure, and deterioration of collagen, leading to rosacea with a scaly, flaming red, and papule-covered face. Other diagnoses and treatments must be considered if, after years of corticosteroid treatment, demonstrate no improvement. Rosacea with facial erythema as a common presentation is very challenging to diagnose. Careful clinical judgments and considerations of therapy must be made before giving long-term corticosteroid therapy due to the possible following adverse effect such as steroid-induced rosacea.

Key words
Facial erythema, rosacea, steroid-induced rosacea, telangiectasia, topical corticosteroids.

Introduction

Rosacea is erythema of the central face that has lasted for months or more, marked by persistent erythema, flushing, telangiectasia, papules, and pustules. It is induced by chronic, repeated exposure of triggers such as sunlight, temperature, exercise, menopausal flushing, cosmetics, medications, spicy food, emotions, liquor, and topical irritants. The characteristic distribution of rosacea is forehead, convex regions of the nose, cheeks, and chin. Patients with rosacea also have defected skin barriers that may become hyperirritable and generate secondary characteristics, including burning sensation on the face, edema, plaques, phyma, dry appearance, peripheral flushing, and ocular symptoms.[1,2]

Diagnosing rosacea is very challenging for clinicians considering the various differential diagnoses of its common presentation; facial erythema, as it may also be a manifestation of numerous diseases. The diagnosis of facial erythema is established on clinical and time of appearance, characteristics of the erythematous lesions, functional signs, and correlation with systemic features. In most cases, facial erythema

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is usually caused by a benign disorder such as rosacea, photodermatosis, contact dermatitis, and climacteric; thus, a thorough and complete history and physical examination are sufficient to make the diagnosis. The presenting symptoms of facial erythema may also be as a sign of drug allergy, cardiac disease, pheochromocytoma, carcinoid syndrome, anaphylaxis, and mastocytosis, as well as rare diseases such as medullary carcinoma of the thyroid, renal carcinoma, and pancreatic cell tumor which further workup evaluations are required.[2-4] Other cutaneous lesions that may exhibit similar symptoms with rosacea is topical steroid-induced acneiform eruption (previously named steroid-induced rosacea).[1]

Although rosacea is commonly seen in daily dermatological practice, its etiopathology still remains unknown. The aim of this case report is to emphasize rosacea as a global disease; review and assess evidence of possible gaps in diagnosis and management in patients with possible triggers of rosacea, notably steroid-induced rosacea; and provide clinical plans to support disease understanding, accurate diagnosis, and proper therapy for the patient with rosacea. Supported by recent studies have demonstrated the association between the use of certain drugs including steroids or vitamins and development of rosacea-like dermatitis or exacerbation of preexisting rosacea.[1]

Case report

A 59-year-old female with a chief complaint redness and flushing all over the facial area for more than one year and worsened. She was previously diagnosed with systemic lupus erythematosus. On further history taking, the patient had been prescribed a topical steroid due to facial rash for years by the dermatologist. The steroids initially worked well, but more potent formulations were necessary to control the eruption progressively. A few months before, the patient used mometasone furoate anhydrous 0.1% cream daily.

Based on clinical history, the patient is diagnosed with rosacea, steroid-induced rosacea-like dermatitis, cutaneous lupus erythematosus, erythematous facial lesion, and multiple discrete telangiectasias found on physical examination. The patient was tapered off the use of topical corticosteroids, then treated with topical metronidazole 0.75%, topical nicotinamide 4%, and topical tretinoin 0.025%.

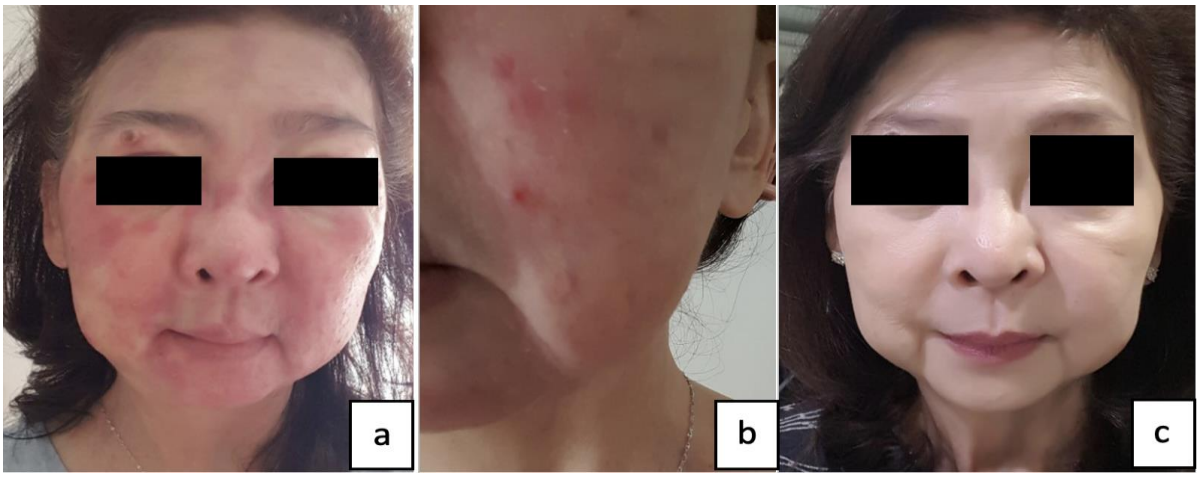

Figure 1 First day patient visited dermatologist, with clinical lesions: erythematous facial lesion and multiple discrete telangiectasia (a). After 1 month of treatment (b). Clear of lesion after 5 months of treatment (c). The picture is well informed-consent by patient for publication.

An improvement was shown after one month of treatment, and clear of the lesion was achieved after five months of treatment.

Discussion

The diagnosis of rosacea can be established clinically. The National Rosacea Society (NRS) Expert Committee in 2017 defined the subtypes of rosacea provisionally, which include erythematotelangiectatic, phymatous, papulopustular, and ocular subtypes.[5] In rationale guidelines for diagnosing rosacea signify the presence of one or more associated primary symptoms, including flushing (transient erythema), persistent (nontransient) erythema, pustules, papules, and telangiectasia, that are generally associated with sensitive skin and the sensation of stinging, itching, and burning. Facial erythema is highly common finding in rosacea; as it may be the presenting sign in all subtypes of rosacea and affects up to 87% of cases.[5-7] Our patient was diagnosed as rosacea posited by the clinical finding of the erythematous facial lesion and multiple discrete telangiectasias.

Topical steroids overuse may also present in a similar lesion. The steroid-induced rosacea can also exhibit the similar symptoms of papulopustular rosacea. Prolonged use of topical steroids may cause monomorphic inflammatory papules to develop on the face.[1,8] Medical history is also essential to be explored that may disclose related precipitating or exacerbating factors that the patients should avoid.[9] In this patient, we found scaly, papule-covered, and flaming red face, with long term use of corticosteroids as the prime triggering factor.

Initially, anti-inflammatory and vasoconstrictive effects of the steroids result in clearance of primary dermatitis, but continuous use leads to atrophy of the epidermis, degeneration of dermal structure, and deterioration of collagen after a few months.[10-12] Multiple pathways induce rosacea-like eruption, including rebound vasodilatation and pro-inflammatory cytokine release by chronic intermittent steroids exposure. The moderate time of treatment needed to generate adverse effects in most cases is six months or more, but it is potency-dependent and varies.[11,13] Therefore, high potent topical corticosteroids such as clobetasol propionate, betamethasone, fluticasone, and mometasone presumably induce this condition.[10] Considering the side effects of long term corticosteroids use, after years of treatment without any improvement, other diagnosis and treatment must be thought off.

Rosacea varies clinically, with the pathophysiology remaining uncertain. However, immune dysfunction, microbe infection, and exposure to the radiation of ultraviolet light are deemed as contributing factors.[7] The concept of follicle-based inflammation which is induced by microbes in rosacea has long been debated. It is still unknown whether the commensal organisms such as *Demodex folliculorum* and *Propionibacterium acnes*, which are located in sebaceous glands and hair follicles, could trigger the appearance of folliculocentric inflammatory papules in patients with rosacea. Alternately, a hypersensitivity reaction may be induced by these microbes or by *Bacillus oleronius* and other mite-associated bacterias. The popular arguments in favor of a microbe-induced mechanism for papulopustular rosacea comprise the observation that nonsteroidal anti-inflammatory drugs and corticosteroids do not clear papules and pustules as effective as oral tetracyclines. Also, benzoyl peroxide is particularly efficacious for papules and pustules in patients with rosacea who tolerate this drug.[1,7]

Before implementing therapy to a rosacea patient, aggravating factors and triggers that

were specific to each patient should be identified. Patient must be educated about stress trigger avoidance. In this case, the patient was treated by tappering off the use of topical corticosteroids as the main triggering factor. The initial management is discontinuation of the topical corticosteroids, followed by oral tetracycline, topical calcineurin inhibitor, topical antimicrobial, or a combination of these agents for one-three months. Relapse typically does not occur as long as topical steroids are not reused.[1] The patient has good response after treated with topical of metronidazole 0,75%, topical nicotinamide 4%, and topical tretinoin 0,025%. Patient cleared of lesions after 5 months of treatment. In accordance with the topical medications approved by the US Food and Drug Administration (FDA) for rosacea include 15% azelaic, acid gel, 10% sodium sulfacetamide with 5% sulfur, and 0.75%, and 1% metronidazole. The off-label topical formulations for rosacea include benzoyl peroxide, erythromycin, clindamycin, calcineurin inhibitors, and topical retinoids.[1] Randomized controlled trial by Miyachi *et al.* found that the use of topical 0.75% metronidazole for 12 weeks improved both inflammatory lesions (pustules/ papules) and erythema.[14] Topical metronidazole is also typically well tolerated, with minimal adverse effects of dryness, stinging, and burning in less than 2% patients.[15] The study concluded that 0.75% metronidazole gel had clinically meaningful and statistically significant outcome.[14] Nicotinamide can also be used as a topical agent for treating rosacea, as it increases the synthesis of collagen and proteins that are involved in formation of filaggrin, keratin, and involucrin. A study found that in 34 rosacea patients that are treated with 0.25% N-methyl-nicotinamide (a metabolite of nicotinamide), 76% showed a good to moderate improvement. Typically, patients found that 2 weeks of application decreased papules and erythema by 50-75%.[16] As an alternative, retinoids also have therapeutic effects for inflammatory rosacea lesions. Of retinoids, tretinoin 0.025% gel were well tolerable in patients and significantly improve papulopustular rosacea.[17,18]

In the updated review on therapies for rosacea by van Zuuren *et al.*, laser and intense pulsed light therapy are also recommended for erythema and telangiectasia.[19] In addition, rosacea patients are encouraged to gently apply skin care and sunscreens, with doing moisturizing and cleansing on moderation. This is due to the impairment of skin barrier function and high vulnerabilities to infection in the rosacea area of the skin. Their facial skin is also easily irritated by nature.[7] Li *et al.* conducted a study which revealed that high frequency of cleansing and high use of skin cleansers have a positive correlation with the occurrence of rosacea.[20]

Conclusion

Rosacea with facial erythema as a common presentation is very challenging in diagnosis. Careful clinical judgments and considerations of therapy must be made before diagnosing and managing dermatology cases including rosacea. Dermatologists also have to educate rosacea patients on the nature of the disease, the features and symptoms, the triggers and how to avoid them, and the importance of skin care and lifestyle modifications.

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