

Recognizing Rosacea: Tips on Differential Diagnosis

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ABSTRACT

Rosacea is a common chronic inflammatory dermatosis with a variety of clinical manifestations. Rosacea primarily affects the central face, and includes papules, pustules, erythema, telangiectasias, perilesional redness, phymatous changes, and even ocular involvement. Symptoms may vary among different patients and even vary over time in an individual patient. Central facial redness affects many adults and can be an indicator of the chronic inflammatory disease rosacea. Rosacea is a clinical diagnosis based on the patient's history, physical examination, and exclusion of other disorders. It is under-diagnosed, particularly in individuals with skin of color. The goal of this article is to provide clinicians with the tools and understanding needed to correctly identify rosacea and differentiate it from other conditions that have overlapping signs and symptoms.

J Drugs Dermatol. 2019;18(9):888-894.

INTRODUCTION

Rosacea is a chronic inflammatory skin disease with a complex, multifactorial pathophysiology that remains to be fully understood. An enhanced immune response and neuroimmune/neurovascular alterations are thought to have a central role.[1] The disease is characterized by a waxing and waning natural history. Different symptoms may manifest at different time periods.[2] Rosacea is underdiagnosed, and the exact prevalence of rosacea is unknown. However, it is estimated to occur in 2% to 10% of the adult population.[2,3] The goal of this article is to help clinicians recognize rosacea and distinguish it from other dermatologic conditions that may have similar signs and symptoms.

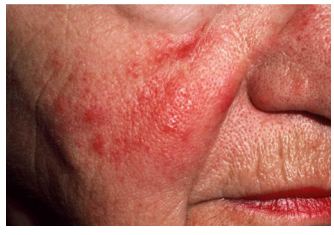
Step 1 in Recognizing Rosacea: Understanding the "Typical" Rosacea Patient

Central facial redness and erythema have been recognized as the hallmarks of rosacea and may occur alone or in combination with a constellation of symptoms (Figure 1).[4,5] The diagnosis of rosacea is often first made in individuals aged 30-60 years. Women are two to three times more likely to be affected than men.[6,7] However, men may be more likely to have severe symptoms and phymatous overgrowth of skin (especially rhinophyma).[2] Rosacea is most common in fair-skinned individuals with Northern European heritage, but can affect all ethnicities and skin types.[6,8-10]

Signs and symptoms of rosacea include marked involvement of the central face with telangiectasias, papules, pustules, and intermittent or chronic facial edema.[8,11] Patients may experience an uncomfortable flushing (transient erythema), which can be accompanied by stinging, burning, or itching and extend down the neck to the chest.[10] Rosacea manifestations are often transient, and occur independently; thus, it is prudent to use a symptom-oriented approach in management.[12] Ocular problems occur in up to 50% of patients with rosacea, and are seen equally in men and women. Clinical features usually manifest as inflammatory conjunctivitis with or without blepharitis.[6] Patients may complain of a gritty sensation, and itchy, burning, or dry eyes may occur; erythema or lid swelling may also be present. With chronic ocular involvement, corneal neovascularization and keratitis can occur, ultimately leading to corneal scarring and perforation.[13]The severity of skin and ocular symptoms are not correlated. Ocular rosacea can be present in the absence of skin symptoms.[8,10]

Dermatologists who treat many patients with skin of color recognize that rosacea is uncommon but not rare among this demographic (Figure 2).[14] Factors that may contribute to a

FIGURE 1. Typical presentation of rosacea with central facial redness and small papulopustular lesions. *Photo courtesy of DermQuest.*



lower rate of diagnosis in dark skinned individuals may include difficulty in identifying redness in more pigmented skin, lower genetic propensity to rosacea, or the ability of melanin to protect against ultraviolet light as a trigger of rosacea. In one of the few articles about rosacea in skin of color in the current literature, Alexis reports that rosacea in darker skinned individuals (Fitzpatrick types IV to VI) often presents in women previously diagnosed with late-onset acne even if these women did not have acne in their second through fourth decade of life.[14] Further, he notes that many of the women have sensitive skin, react with burning or stinging to skin care products, and may have sensations of facial warmth (with or without visible flushing) in response to known rosacea trigger factors.[14] Similar to the clinical presentation in lighter skinned individuals, dark skinned patients may have papules and/or pustules clustered in the central facial region, with erythema of varying severity.[14] The erythema may be more difficult to appreciate in a person with a darker skin tone. Patients may be very frustrated after treating their disease with multiple acne therapies, since many have experienced skin irritation with topical acne treatments. In diagnosing rosacea in skin of color, Alexis reports "erythema may be difficult to appreciate and telangiectasias usually are not observed in highly pigmented skin." As a result, he suggests that gathering an understanding of "a history of exacerbating factors, sensitivity to multiple topical products, episodic warmth of the face (or flushing), and ocular symptoms is especially helpful in establishing the diagnosis."[14]Taylor et al add that examining skin with a bright light and microscope slide to detect blanching can help clinicians see faint erythema.[15]

The psychosocial impact of rosacea and negative effects on emotional health and quality of life are often under-appreciated by clinicians.[10] The signs of rosacea (redness, telangiectasias) can be interpreted by lay persons as signs of excessive alcohol consumption, leading to stigmatization that exacerbates emotional distress.[10]

The Diverse Sources of Redness in Rosacea

Rosacea is characterized by redness, but it is very important – particularly in designing management strategies – for the clinician to be aware that there are differing sources of skin redness.[11,16] Identifying the redness source will help target treatment options and patient education. Figure 3 illustrates how a patient may have various causes of facial erythema—they may have persistent erythema without a lesional aspect, erythema plus inflammatory lesions, perilesional erythema, or redness due to permanent blood vessel dilation and neoangiogenesis. Transient erythema may also occur. These different sources of redness require different treatments, and patients should be educated about what to expect with a specific treatment. For example, a treatment that targets lesions may have little to no effect on persistent erythema or telangiectasias. On the other hand, a treatment that targets only diffuse erythema may give the perception that the lesions have become worse or more red, when simply the camouflage of the background redness has disappeared making the lesions stand out more.

FIGURE 2. (A) Rosacea in a black woman with Fitzpatrick skin type V, (B) rosacea in a black woman with Fitzpatrick skin type VI. Papules and small pustules are present without appreciable erythema. Please note the absence of comedones. Patient B reported an episodic sensation of warmth on the face as well as stinging or burning from most topical agents she tried. *Reprinted with permission from Alexis.*[14]

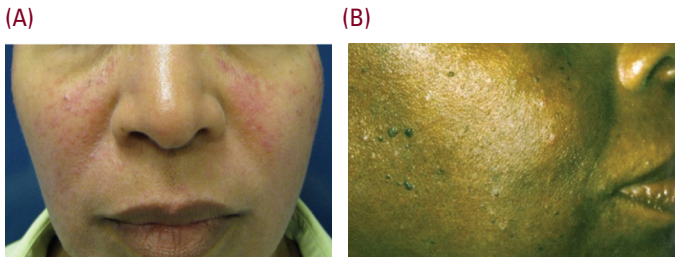
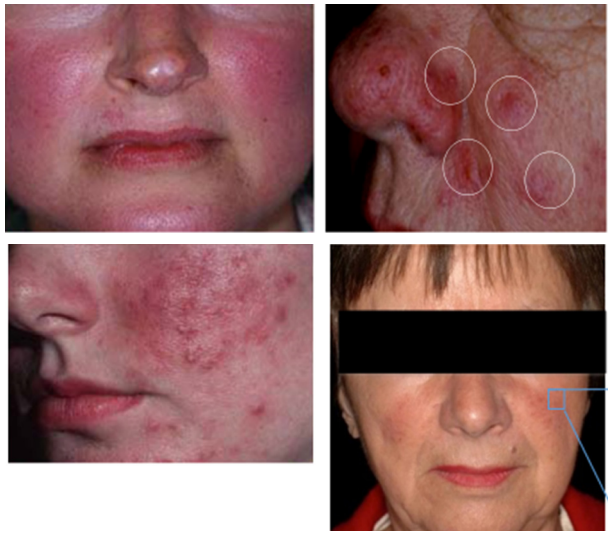


FIGURE 3. Illustration of different sources of redness in patients with rosacea. *Photos courtesy of Dr Jurgen Schauber and Dr James Del Rosso.*



Trigger Factors in Rosacea

Patients with rosacea often indicate that certain factors trigger exacerbations; Table 1 presents the most common rosacea triggers according to a recent survey by the National Rosacea Society.[17] It can be useful for patients to keep a diary to identify triggers that should be avoided; diaries are available at www.rosacea.org.[6]

Step 2 in Recognizing Rosacea: Differential Diagnosis

Distinguishing between rosacea and other conditions can be challenging, particularly since the specific facial and ocular

TABLE 1.

Top 10 Most Frequent Rosacea Triggers from National Rosacea Society Survey of 1,066 Rosacea Patients[17]	
Factor	**Percent Affected**
Sun exposure	81%
Emotional stress	79%
Hot weather	75%
Wind	57%
Heavy exercise	56%
Alcohol consumption	52%
Hot baths	51%
Cold weather	46%
Spicy foods	45%
Humidity	44%

TABLE 2.

Differentiating Rosacea and Acne Vulgaris		
Factor	**Rosacea**	**Acne**
Comedones	No	Yes
Telangiectasias	Yes	No
Eye symptoms	Yes	No
Involvement of non-facial skin	Rare	Common

signs and symptoms vary from patient to patient.[6] It is important for clinicians to be aware of lesion/redness patterns and nuances in order to effectively evaluate patients.

Primarily Lesional Presentation

Acne vulgaris

Acne may be mistaken for rosacea, particularly in adults with late-onset acne (Figure 4).[6] Comedones are often present with acne vulgaris and absent with rosacea. Telangectasias are often present with rosacea and absent with acne vulgaris. (Table 2).[6] The presence of eye symptoms also tilts the diagnosis toward rosacea.[6,18] Rosacea rarely affects children and adolescents, whereas acne is more common in young people than old.[10] Acne patients may be less likely to report suffering from flushing compared with rosacea patients.[10] Finally, involvement of non-facial areas (chest and back) is common in acne, and rare with rosacea.[10] Rosacea affects mainly the central face (cheeks, nose, and forehead). Acne can appear anywhere on the face with hormonal acne more concentrated on the chin, jawline, and neck.

Steroid-induced acne/rosacea/perioral dermatitis

The use of topical or inhaled corticosteroids can result in an acneiform eruption that looks similar to papulopustular rosacea (Figure 5). However, steroid-induced acne usually is seen in a perioral distribution, comedones are absent, and the patient may be older than the typical acne sufferer.[6] Lesions resolve

FIGURE 4. Examples of adult patient with acne. Note distribution of lesions includes forehead, which is less common with rosacea (A) and presence of comedones (B). *Photo from DermQuest.com.*

(A) (B)

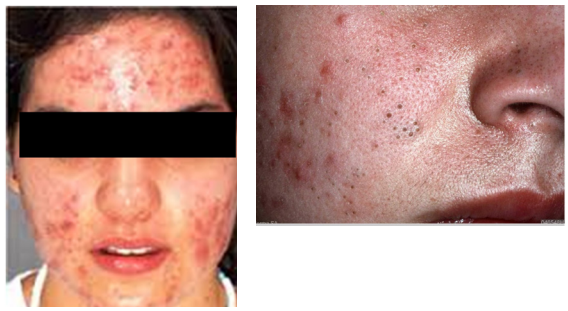


FIGURE 5. Illustration of steroid-induced acneiform lesions. *Photo courtesy of DermQuest.*

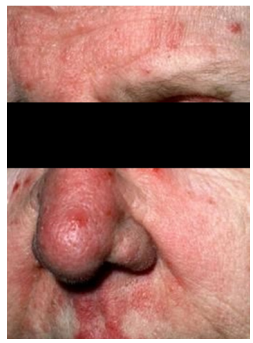
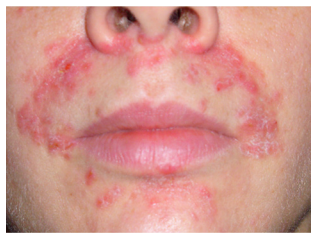


FIGURE 6. Perioral dermatitis. *Photo courtesy of DermQuest.*



when steroid use is discontinued. During history taking, patients should be asked about recent steroid use. As shown in Figure 6, this type of dermatitis manifests as a scaly or red rash around the mouth – sparing the vermillion border – with small papules and scaling. It can also be seen in patients with a history of overuse of heavy face creams and moisturizers. It is most common in young women, but can occur in children and men as well.[19]

Demodicidosis

Demodicidosis (Demodex folliculitis) presents as numerous inflammatory papules on the face and occurs when Demodex mites infest the pilosebaceous unit or penetrate dermal tissue.[20] Clinically, there can be varying degrees of skin roughness,

FIGURE 7. Demodicosis. *Photo courtesy of DermQuest.*

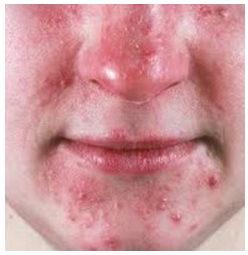
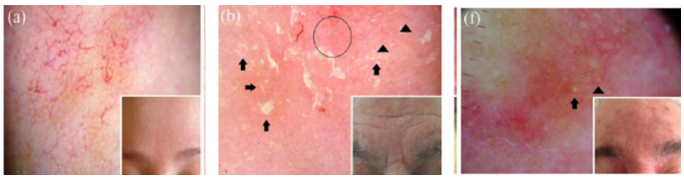


FIGURE 8. Rosacea, seborrheic dermatitis, and demodex on dermoscopy. (A) Rosacea is characterized by the presence of linear vessels, typically arranged in a polygonal network. (B) Seborrheic dermatitis has dotted vessels in a patchy distribution (black circles) and yellowish scales (arrows) plus blurry linearly branching vessels (arrow heads). White scales may also be seen. (C) in Demodicidosis, Demodex tails may be seen as white threads protruding from follicular openings (arrow) and round/coarse follicular openings (Demodex follicular openings) may be seen (arrowhead). *Adapted with permission from Errichetti et al.*[21]



erythema, and papules and pustules (Figure 7); patients may report sensations of skin burning or pruritus. Dermoscopy may show portions of Demodex in and around the follicular opening.[21] Mites may also be seen on microscopy. Demodex mites are part of the normal skin flora but there is evidence of an increased density of Demodex mites in patients with rosacea.[22] Patients with demodicidosis show a positive response to antidemodectic drugs.[20]

Gram negative folliculitis

Patients using prolonged courses of oral antibiotics for acne vulgaris or rosacea may develop gram-negative folliculitis, a persistent papulopustular rash (Figure 9). The antibiotic alters resident skin flora, allowing growth of gram-negative organisms in the nares, which can then spread to adjacent skin areas. Culture of the lesions yields gram-negative bacilli and rods (*Escherichia coli, Klebsiella, Enterobacter*, and *Proteus species*), and patients often report a sudden acne flare despite no change in treatment.[19]

Primarily Erythematous Presentation

Lupus erythematosus

Lupus erythematosus is an autoimmune disease with cutaneous manifestations that can resemble rosacea (Figure 10). Pustules are rare in the malar rash of lupus.[23] Discoid lupus is named for the coin-like red, scaly lesions that appear on cheeks, nose, ears, and scalp. Lupus can also be associated with red

FIGURE 9. Gram-negative folliculitis. *Photo courtesy of DermQuest.*

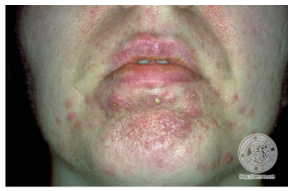
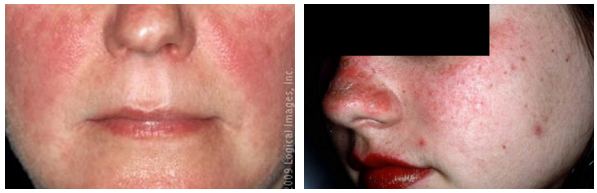


FIGURE 10. Lupus erythematosus. *Photo courtesy of DermQuest.*



scaly lesions that are similar to seborrheic dermatitis. In patients with skin of color, serologic testing, and skin biopsy may be warranted to correctly diagnose lupus.[15] This is especially important if the patient is not responding to typical rosacea regimens.

Seborrheic dermatitis

Seborrheic dermatitis is common in males and often has onset at puberty. The clinical presentation includes symmetrical, well demarcated, yellowish red patches/plaques with overlying adherent, yellowish greasy scales in areas rich in sebaceous glands.[24] Dermoscopic clues can be useful in distinguishing seborrheic dermatitis from rosacea. On dermoscopy, rosacea has linear vessels arranged in a polygonal network while seborrheic dermatitis has dotted vessels in a patchy distribution (Figure 8).[21] Rosacea and seborrheic dermatitis often coexist in the same patient making the diagnosis even more difficult. The term dyssebacea is often used for patients suffering with multiple issues of the pilosebaceous unit including rosacea, seborrheic dermatitis, and sebaceous hyperplasia.

Photodamage

Photodamage typically includes rough skin, wrinkles/rhytids, as well as facial erythema and telangiectasia (Figure 12). Helfrich et al. argue that there is a subtype of photodamage characterized by significant telangiectasia and persistent facial erythema who lack other rosacea symptoms (flushing, burning, stinging). They note that this usually occurs in older men, and that a distinguishing clinical feature is localization of the telangiectasia and erythema more toward the lateral face rather than central face.[25] Photodamage may also manifest as Favre-Racouchot Syndrome, a nodular cutaneous elastosis with cysts and multiple open and closed comedones that are often clustered in the periocular region.[26]

FIGURE 11. Seborrheic dermatitis. *Photo courtesy of DermQuest.*

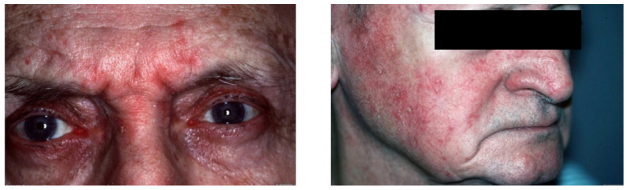


FIGURE 12. Examples of photodamage. *Photo courtesy of DermQuest.*

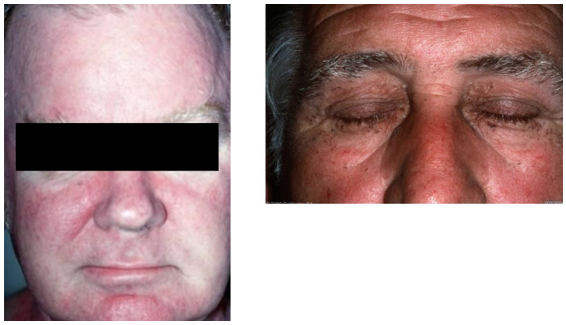
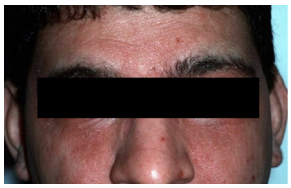


FIGURE 13. Atopic eczema. *Photo courtesy of DermQuest.*



Atopic dermatitis (AD)

Atopic dermatitis most commonly affects children, often before their first birthday, but can also develop in adulthood (Figure 13).[27] Atopic dermatitis occurs in 2-10% of the adult population. Symptoms include xerotic and/or pruritic skin that can be accompanied by erythema. Unlike rosacea, AD will affect any part of the body. AD typically is found on hands, insides of elbows, backs of knees in addition to face and scalp.[27]

Miscellaneous Diseases That May Mimic Rosacea

Psoriasis most often manifests as thick, red patches with silvery white scales on various areas of the body; however, erythrodermic psoriasis may cause facial redness and erythema that may look similar to rosacea. Pustular psoriasis may also appear similar when present on the face, but these may be accompanied by lesions on the palms of hands and soles of feet, which are not involved in rosacea. Impetigo, a skin infection due to Staphylococcus or Streptococcus, may cause lesions that look similar to rosacea when in adults; however, impetigo most typically affects children.[28] Erysipelas, a superficial cellulitis involving the upper dermis, can cause facial redness. However, erysipelas usually presents rapidly, with spreading, painful well defined bright red lesions. Lower extremities are most often affected, but it can occur on the face. Unlike rosacea, facial erysipelas is often asymmetric and does not spare the nasolabial or periorbital areas.[29]

TABLE 3.

Additional Steps When Assessing the Rosacea Patient to Optimize Treatment	
Assessment	**Intervention**
Is the patient having a rosacea flare?	Subside acute flares with rapid-acting treatment and set expectation: rosacea is a chronic disease that tend to relapse- some new topical drugs tend to decrease relapse rate
Are redness and erythema present?	Topical treatment to reduce redness and erythema After successful erythema treatment, **inflammatory lesions may still remain**
Does the patient have telangiectasias?	Oral and/or topical anti-inflammatory medications • Minimize rosacea-associated inflammation • Treat inflammatory lesions • Consider combination therapy After successful lesional treatment, **erythema may still remain**
Does the patient have papules or pustules?	Use a gentle skin cleanser, moisturizer, appropriate medications, and sun smart behaviors
Does patient practice good skin care?	• Set expectations about therapy • Well-educated patients may be more compliant and achieve potentially better efficacy
Does the patient understand what to expect from therapy?	Educate patient about potential triggers and have the patient note reactions to common triggers; if any are reactive, help the patient develop strategies to avoid exposure

Additional general considerations when assessing a rosacea patient are shown in Table 3.

When Rosacea Is Diagnosed: Overview of Treatment Approach

For past decade, a subtype classification has been used, but now rosacea experts are advising a move toward a phenotype approach which allows better targeting of treatment.[4, 5, 30] Assessment has also been challenging, since many assessment tools have grouped redness with lesions and these symptom types do not respond to same treatments or track in improvement.[5] With the introduction of several new products into the marketplace, more aspects of rosacea can be addressed. Thus, it is increasingly important to hone diagnostic and assessment skills.

Recently, it has been shown that treating rosacea to complete clearance has an important beneficial impact on patient satisfaction and remission.[31] Webster et al. compared results from patients who achieved an investigator global assessment

(IGA) score of 1 (almost clear) or 0 (clear) in four randomized clinical trials of treatment with ivermectin 1% cream, metronidazole 0.75% cream, or vehicle. Evaluations included time to relapse, the Dermatology Life Quality Index (DLQI) and subject assessment of improvement in rosacea. Patients with complete clearing had almost half a year longer relapse-free period compared to those rated 'almost clear' (>8 months vs 3 months, *P*<.0001). In addition, quality of life was significantly better in the 'clear' group. A clinically relevant improvement in DLQI score was statistically significantly more likely in those who achieved 'clear' compared to 'almost clear' (59% vs 44%, *P*<.001). Further, a large majority of those rated 'clear' (84%) had a final DLQI score of 0-1, indicating rosacea no longer adversely affected their quality of life (*P*<.001 vs 'almost clear' at 66%). The authors noted that improving treatment with "earlier effective treatment and longer remission times might not only control symptoms, but also delay progression of disease." Notably, a comparative study of ivermectin 1% cream QD versus metronidazole 0.75% cream BID in subjects with moderate to severe rosacea showed that more subjects were judged "clear" with ivermectin (34.9% vs 21.7% with metronidazole).[32] The difference in treatment efficacy was even more marked in the subgroup of individuals with severe rosacea, where clearing was 27.5% with ivermectin vs 12.3% with metronidazole.[32]

Topical treatments for rosacea target papules/pustules and include metronidazole 0.75% cream, ivermectin 1% cream, azelaic acid 15% gel and foam, and sodium sulfacetamide 10% with or without sulfur 5%. Topical treatments for erythema include brimonidine 0.33% gel and oxymetazoline 1% cream. These treatments can be combined for best results, and the recent MOSAIC study showed that initiation of therapy with a combination regimen of ivermectin 1% cream plus brimonidine 0.33% gel was associated with superior efficacy and good patient acceptance.[33] In addition, medical and physical therapies may be used together for good results.[34,35] Commonly used oral therapies for rosacea include tetracycline-type agents in an antibiotic dose and in a sub-antimicrobial dose. Clinician-directed skin care (cleanser, moisturizer, sun protection) should be a part of the rosacea regimen to improve therapeutic outcomes and decrease the likelihood of skin irritation.[11] Treatment can now be individualized to the patient's presentation, taking into account the specific signs and symptoms present, trigger factors, and patient preferences.

CONCLUSIONS

Rosacea is a complex disease that is often under-diagnosed, particularly in dark-skinned individuals. For best outcomes, it is important for clinicians to be able to recognize rosacea and differentiate it from other diseases with similar presentations. Patients with rosacea typically have multiple signs and symptoms that require different therapies, which may include medical and physical approaches as shown in the MOSAIC Study. In addition, clinicians may need to have different discussions with patients, depending on what manifestations are present at the given time. Optimally, all signs/symptoms should be addressed at the same time to increase patient satisfaction with outcomes. Today there are different drugs with targeted mechanisms of action and complete clearance is a realistic, achievable clinical goal.

DISCLOSURES

Editorial services for this publication were provided by Galderma Laboratories. All authors have served as consultants for Galderma. The authors wish to acknowledge Valerie Sanders, Sanders Medical Writing, for assistance with preparation of this publication.

REFERENCES

1. Del Rosso JQ, Gallo RL, Kircik L, et al. Why is rosacea considered to be an inflammatory disorder? The primary role, clinical relevance, and therapeutic correlations of abnormal innate immune response in rosacea-prone skin. *J Drugs Dermatol.* 2012;11:694-700.
2. Napierkowski DB. Rosacea: Diagnosis and management. *Nurse Pract.* 2016;41:8-13.
3. Navaratna AF, Walsh A , Magin P. More than meets the (painful red) eye. *Aust Fam Physician.* 2016;45:383-4.
4. Tan J, Almeida LM, Bewley A, et al. Updating the diagnosis, classification and assessment of rosacea: recommendations from the global ROSacea COnsensus (ROSCO) panel. *Br J Dermatol.* 2017;176:431-8.
5. Tan J, Steinhoff M, Berg M, et al. Shortcomings in rosacea diagnosis and classification. *Br J Dermatol.* 2017;176:197-9.
6. Blount BW, Pelletier AL. Rosacea: a common, yet commonly overlooked, condition. *Am Fam Physician.* 2002;66:435-40.
7. Berg M , Liden S. An epidemiological study of rosacea. *Acta Dermato-venereologica.* 1989;69:419-23.
8. Del Rosso JQ, Thiboutot D, Gallo R, et al. Consensus recommendations from the American Acne & Rosacea Society on the management of rosacea, part 1: a status report on the disease state, general measures, and adjunctive skin care. *Cutis.* 2013;92:234-40.
9. Rosen T, Stone MS. Acne rosacea in blacks. *J Am Acad Dermatol.* 1987;17:70-3.
10. Tidman MJ. Improving the management of rosacea in primary care. *Practitioner.* 2014;258:27-30,3.
11. Del Rosso JQ. Advances in understanding and managing rosacea: part 1: connecting the dots between pathophysiological mechanisms and common clinical features of rosacea with emphasis on vascular changes and facial erythema. *J Clin Aesthet Dermaotl.* 2012;5:16-25.
12. Wilkin J, Dahl M, Detmar M, et al. Standard classification of rosacea: Report of the National Rosacea Society Expert Committee on the Classification and Staging of Rosacea. *J Am Acad Dermatol.* 2002;46:584-7.
13. Quarterman MJ, Johnson DW, Abele DC, et al. Ocular rosacea. Signs, symptoms, and tear studies before and after treatment with doxycycline. *Arch Dermatol.* 1997;133:49-54.
14. Alexis AF. Rosacea in patients with skin of color: uncommon but not rare. *Cutis.* 2010;86:60-2.
15. Taylor SCD, J. N. Acne and rosacea: a closer look at skin of color. *Medscape* 2012.
16. Del Rosso JQ. Advances in understanding and managing rosacea: part 2: the central role, evaluation, and medical management of diffuse and persistent facial erythema of rosacea. *J Clin Aesthet Dermatol.* 2012;5:26-36.
17. National Rosacea Society. Rosacea triggers survey.
18. Kligman AM. Ocular rosacea. Current concepts and therapy. *Arch Dermatol.* 1997;133:89-90.
19. Kuflik JH. Acneiform eruptions clinical presentation. *Medscape* 2016.
20. Friedman P, Sabban EC, Cabo H. Usefulness of dermoscopy in the diagnosis and monitoring treatment of demodicidosis. *Dermatol Pract Concept.* 2017;7:35-8.
21. Errichetti E , Stinco G. Dermoscopy in general dermatology: a practical overview. *Dermatol Ther (Heidelb).* 2016;6:471-507.
22. Zhao YE, Wu LP, Peng Y, et al. Retrospective analysis of the association between Demodex infestation and rosacea. *Arch Dermatol.* 2010;146:896-902.
23. Walling HW, Sontheimer RD. Cutaneous lupus erythematosus: issues in di-

agnosis and treatment. *Am J Clin Dermatol.* 2009;10:365-81.
24. Ooi ET, Tidman MJ. Improving the management of seborrhoeic dermatitis. Practitioner .2014;258:23-6, 3.
25. Helfrich YR, Maier LE, Cui Y, et al. Clinical, histologic, and molecular analysis of differences between eythematotelangiectatic rosacea and telangiectatic photoaging. *JAMA Dermatol.* 2015;151:825-36.
26. Sonthalia S, Arora R, Chhabra N, et al. Favre-Racouchot syndrome. *Ind Dermatol Online J.* 2014;5:S128-9.
27. Barankin B, Guenther L. Rosacea and atopic dermatitis. Two common oculocutaneous disorders. C*an Fam Physician.* 2002;48:721-4.
28. Hartman-Adams H, Banvard C , Juckett G. Impetigo: diagnosis and treatment. A*m Fam Physician.* 2014;90:229-35.
29. Datta I, Casanas B, Vincent AL, et al. The red face: Erysipelas versus, parvovirus B19, SLE, and rosacea. *Asian Biomedicine.* 2009;3:681-8.
30. Schaller M, Almeida LM, Bewley A, et al. Rosacea treatment update: recommendations from the global ROSacea COnsensus (ROSCO) panel. *Br J Dermatol.* 2017;176:465-71.
31. Webster G, Schaller M, Tan J, et al. Defining treatment success in rosacea as 'clear' may provide multiple patient benefits: results of a pooled analysis. *J Dermatol Treat.* 2017;28:469-74.
32. Schaller M, Dirschka T, Kemeny L, et al. Superior efficacy with ivermectin 1% cream compared to metronidazole 0.75% cream contributes to a better quality of life in patients with severe papulopustular rosacea: A subanalysis of the randomized, investigator-blinded ATTRACT study. *Dermatol Ther (Heidelb).* 2016;6:427-36.
33. Gold LS, Papp K, Lynde C, et al. Treatment of rosacea with concomitant use of topical ivermectin 1% cream and brimonidine 0.33% gel: A randomized, vehicle-controlled study. *J Drugs Dermatol.* 2017;16:909-16.
34. Hofmann MA, Kokolakis G. A case report of combination treatment with potassium-titanyl phosphate laser and brimonidine topical gel in erythematotelangiectatic rosacea. *J Cosm Laser Ther.* 2017;19:222-4.
35. Nestor MS. Combination therapy in clinical and cosmetic dermatology: the marriage of device and drug. *J Drugs Dermatol.* 2004;3:S4-11.

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