ROSACEA, THE EYE, AND THE GUT

How these three components relate, and what ODs need to know about them.

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Rosacea is a chronic inflammatory skin condition characterized by recurrent episodes of erythema, telangiectasia, papules, and pustules primarily affecting the central face and periocular regions. Its pathogenesis is hypothesized to be from a combination of immune system dysregulation, abnormal vascular and neurologic signaling, and dysbiosis of microorganisms leading to inflammation of the skin.[1] An estimated 15% of the population has rosacea, with increased prevalence in people of Northern European descent. It can affect individuals of all ages, but it most commonly affects those between their 30s and 50s.[1,2]

Certain triggers, such as heat, spicy foods, alcohol, exercise, and emotional stress, can exacerbate rosacea. These triggers cause vasodilation, leading to inflammation of the skin.[1,2]

Rosacea was previously classified into four subgroups: erythematotelangiectatic, papulo-pustular, phymatous, and ocular. In 2017, the classification system was updated to be based on phenotypes, as more than one subgroup can occur at the same time. For patients to be diagnosed with rosacea based on the new criteria, they must possess at least one diagnostic phenotype or two major phenotypes. The two specific diagnostic phenotypes are fixed centrofacial erythema or phymatous changes. The major phenotypes include papules and pustules, flushing, telangiectasia, and ocular manifestations.[2]

THE OCULAR CONNECTION

Ocular involvement is said to be present in about 75% of rosacea patients, and 20% of these patients present with ocular involvement before skin manifestations (Table 1).[2] This statistic is important to note, as optometrists can diagnose rosacea before the patient sees a dermatologist.

The most common ocular symptoms include burning, itching, foreign body sensation, tearing, redness, light sensitivity, and blurred vision. The loss of meibomian glands and tear film insufficiency can cause these symptoms. The blockage and inflammation of the meibomian glands can lead to changes in the quality and quantity of meibum, also causing dry eye symptoms.

Additionally, *Demodex* mites can appear in increased density on the skin and eyelids of patients with rosacea. *Demodex* causes eyelid inflammation and can physically block the meibomian glands. They also serve as a vector for bacteria, such as *Streptococci* and *Staphylococci*,

TABLE 1. Ocular Manifestations of Rosacea.[3]

Below are some of the ocular signs associated with rosacea.

Lid margin telangiectasia	Collarettes at the base of the lashes
Conjunctival injection	Lid margin irregularity
Spade-shaped corneal infiltrates	Evaporative tear dysfunction
Scleritis and sclerokeratitis	

to enter deep into the glands.[2,4] It is important to thoroughly examine the lids, lashes, conjunctiva, and cornea at the slit lamp.

THE GUT-BIOME CONNECTION

The human microbiome is a community of microorganisms that exist together in the body. The skin and the gastrointestinal tract both have complex microbiomes made up of trillions of microorganisms, including bacteria and fungi.[1] Various factors can affect an individual's microbiome (the collective genomes of microorganisms inhabiting the human body), including age, gender, diet, hygiene, and environmental exposures.[1,8]

Research has shown a connection between the gut and the skin in those with rosacea. For example, intestinal and dermatologic dysbiosis have appeared together in individuals with inflammatory skin disorders. Studies have also shown an increased prevalence of gastrointestinal disorders such as *Helicobacter pylori* infection, small intestinal bacterial overgrowth, Celiac disease, Crohn disease, and ulcerative colitis in patients with rosacea compared with controls.[1,4,11] Patients with rosacea who complain of gastrointestinal symptoms should be referred to a primary care physician or a gastroenterologist for further evaluation.

All patients, whether diagnosed with rosacea or not, should be provided with dietary recommendations to help promote a healthy gut biome (Table 2), as a healthy gut biome can improve ocular health. These recommendations should include prebiotics and probiotics.[1] Prebiotics are nondigestible foods that act as food for our microflora (the diverse bacterial population living within the human body). Many high-fiber foods act as prebiotics. Probiotics are live microorganisms intended to maintain or improve our normal microflora.[9] You can also recommend supplements such as omega-3 fatty acids, as they aid in decreasing inflammation of the ocular surface and improve the oil production from the meibomian glands.[10] Prebiotics, probiotics, and omega-3s can also be found in supplement form and recommended to patients this way.

AT A GLANCE

- Rosacea is a chronic skin condition that can have ocular manifestations.
- Because ocular symptoms may appear before the condition manifests on the skin, optometrists may diagnose rosacea before the patient sees a dermatologist.
- It's important to promote a healthy gut biome with patients, including dietary recommendations and education on avoiding trigger foods.

TREATING ROSACEA

Treatment of patients with rosacea should begin with education about identifying and avoiding exacerbating triggers. Ask patients if they are able to determine which foods, beverages, temperatures, and/or environments make them flare. From there, patients should try to limit stress and excess sun exposure. It's also important to promote a healthy diet that includes prebiotic and probiotic foods and or supplements (Table 2).

Education on good lid hygiene, including warm compresses, hypochlorous acid sprays, and artificial tears, is also important. Patients should be advised to avoid OTC red eye relief products that can cause rebound congestion. Brimonidine 0.025% (Lumify, Bausch + Lomb) twice daily can be used to target vasodilation. This drop has a lower risk of side effects and rebound redness than previous ocular decongestants. OTC tea tree oil can also help reduce *Demodex* infestation on the eyelids. Topical Ivermectin 1% cream (Soolantra, Galderma) applied at the lash line for 15 minutes once weekly, combined with good lid hygiene, can be effective in the treatment of Demodex blepharitis.[5]

The only FDA-approved treatment to control the inflammatory lesions of rosacea is 40 mg doxycycline USP (Oracea, Galderma) taken once daily.[2] Oral antibiotics can cause gastrointestinal

TABLE 2. Recommendations to Promote a Healthy Gut Biome

PREBIOTICS	PROBIOTICS	OMEGA-3 FATTY ACIDS
Whole grains	Yogurt	Salmon
Bananas	Sauerkraut	Tuna
Greens	Miso	Flax and chia seeds
Onions	Kimchi	Walnuts

complications, so keep this in mind if you are prescribing them to your patients. Another treatment using intense pulsed light (IPL) has also been successful in achieving improvement in rosacea and dry eye disease. The laser destructs the superficial telangiectatic blood vessels, removing a major source of eyelid inflammation. The heat from the laser can also heat the meibomian glands and help to liquefy the meibum, aiding in dry eye disease. In addition, IPL is useful in eradicating Demodex mites, as their pigmented exoskeleton contains chromophore, which absorbs IPL energy, causing necrosis.[6]

In severe cases of cutaneous rosacea, dermatologists may prescribe oral isotretinoin (Accutane, Roche), which is anti-angiogenic. Isotretinoin aids in treating rosacea, but it is toxic to the meibomian glands, which is why it's so important to get a detailed case history from patients. We need to be aware of all medications they are taking and comanage them with other specialties.

CONSIDER THE BIGGER PICTURE

Ocular rosacea is a condition that our practices will commonly encounter. It is therefore important that we treat our patients as a whole, educating them not only about treatments specific to the eye, but also about nutrition and lifestyle changes that can help improve or eliminate some of their ocular symptoms. ■

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