

Optimizing Redness Reduction, Part 2: Rosacea and Cosmeceuticals



Zoe Diana Draelos, MD

Redness reduction remains the biggest challenge in the treatment of facial rosacea. While topical prescription medications, oral prescription medications, or both can adequately control the inflammatory papules and pustules characteristic of the disease, redness reduction remains an enigma. Facial redness resulting from rosacea may be due to telangiectasias, which are minimally affected by topical medical therapies. Flushing, a sign of vasomotor instability, may also account for redness because of a change in temperature, sun exposure, physical exertion, or emotional stress. The causes of redness are difficult to eradicate, thus creating a treatment void that might benefit from the ancillary use of cosmetics and cosmeceuticals.

Part one of this series discussed the selection of cleansers and moisturizers to improve the appearance of facial redness in rosacea patients. This second and final part of the series evaluates the use of cosmetics and cosmeceuticals for redness reduction in patients with facial rosacea. Cosmetics are useful to either partially or completely camouflage the redness caused by rosacea, whereas cosmeceuticals can reduce the inflammation that contributes to low-grade chronic redness.

Cosmetics for Reducing Facial Redness

Colored cosmetics are a useful adjuvant therapy for female rosacea patients. Cosmetics can camouflage redness by either blending colors or concealing the underlying skin in order to achieve a more desirable appearance. When blending colors to minimize facial redness, green is typically used because it is complementary to red. Currently, there are several moisturizers on the market for rosacea patients that contain a slight green tint. These moisturizers are applied after topical prescription medications and are blended evenly into the skin. Because the

Dr. Draelos is Consultant and Researcher for the Skin Care Industry and Primary Investigator, Dermatology Consulting Services, High Point, North Carolina.

The author reports no conflict of interest in relation to this article.

mixture of red and green produce brown, the sheer green tint will tone down bright red cheeks.

Sometimes an application of a green-tinted moisturizer is followed by applying a tan-colored facial foundation that matches a desired skin color because the green tint allows a sheer facial foundation to camouflage red tones more effectively. A green-tinted moisturizer can also minimize redness under the currently popular mineral makeup foundations. Mineral makeup foundations are composed of a powder that is dusted across the face from a container that is attached to a brush. Mineral makeup foundations have become popular among persons with rosacea because they eliminate the need for lotion or cream vehicles. When a lotion or cream foundation is applied to the face, it evaporates, which can cause flushing. The increased number of ingredients that are required in lotion and cream foundations enhance the chances for irritation.

If facial redness remains apparent, a more translucent or opaque foundation can be used, such as a cream or a cream-to-powder foundation. Cream foundations are thick because of an increased concentration of pigments combined with a lack of water. This combination produces an oil-based foundation that is resistant to removal with water and rubbing. Translucent foundations have less pigment and yield a more natural appearance, whereas opaque foundations have more pigment, which gives the face a masked appearance. Some rosacea patients who require aggressive camouflage may wish to select one of the newer cream-to-powder foundations, which are applied like a cream using a sponge found in the compact. The cream then dries on the skin with a powderlike appearance. Cream-to-powder foundations still produce excellent camouflaging with a less masked appearance.

There are instances where redness reduction is preferable to cosmetic camouflage. This is certainly the case in males or females who do not wish to use cosmetics. The next topic is the use of cosmeceuticals that contain ingredients designed to reduce facial redness resulting from rosacea.

COSMETIC CONSULTATION

Cosmeceuticals for Reducing Facial Redness

Cosmeceuticals are over-the-counter moisturizers with a variety of active ingredients designed to enhance the appearance of the skin. Most of the cosmeceuticals designed for rosacea patients contain anti-inflammatory agents intended to reduce facial redness. The anti-inflammatories are botanical extracts that may complement prescription therapies in the maintenance phase of rosacea treatment. Commonly used botanical anti-inflammatories in the current marketplace include ginkgo biloba, green tea, aloe vera, allantoin, feverfew, and *Glycyrrhiza inflata* (Table). The rationale for using these botanicals in currently marketed cosmeceuticals for redness reduction is discussed in the next sections.

Ginkgo Biloba

Ginkgo biloba is a currently popular botanical ingredient in many oral supplements designed to treat cardiovascular disease. Ginkgo biloba leaves contain polyphenols, which function as antioxidants, such as terpenoids (eg, ginkgolides, bilobalides), flavonoids, and flavonol glycosides with anti-inflammatory effects. These anti-inflammatory effects have been linked to antiradical and antiliperoxidant effects in experimental fibroblast

models. However, it is unknown whether these fibroblast effects translate directly into observable human physiologic effects. Ginkgo biloba leaves are used in homeopathic medicine to alter skin microcirculation by reducing blood flow at the capillary level and inducing a vasomotor change in the arterioles of the subpapillary skin plexus. These vasomotor changes may lead to decreased skin redness in rosacea patients.

However, it is important to recognize that botanical supplements, such as ginkgo biloba, are applied to the skin in a moisturizing vehicle for redness reduction. The moisturizer usually contains a variety of ingredients designed to enhance the skin's water content and provide an environment suitable for barrier repair. It is hard to separate the effect of the botanical ingredient from the effect of the moisturizing vehicle. This makes it difficult to accurately study the benefits ginkgo biloba may have on the skin.

Green Tea

Green tea, also known as *Camellia sinensis*, is another anti-inflammatory botanical containing polyphenols. However, the polyphenols in green tea are different than those found in ginkgo biloba. Green tea contains

Cosmeceuticals for Reducing Facial Redness Resulting From Rosacea

Botanical Ingredient	Active Agent	Functional Effect on the Skin
Ginkgo biloba	Terpenoids (eg, ginkgolides, bilobalides), flavonoids, flavonol glycosides	Decreased circulation at the capillary level, reduced inflammation through antiradical and antiliperoxidant effects
Green tea	Polyphenols such as epicatechin, epicatechin-3-gallate, epigallocatechin, epigallocatechin-3-gallate	Reduces UVB-induced inflammation, functions as antioxidant
Aloe vera	Aloin, aloe emodin, aletinic acid, choline, choline salicylate	Salicylate derivative inhibits cyclooxygenase pathway
Allantoin	Diureide of glyoxylic acid	Enhances water-holding capacity of extracellular matrix, improving barrier function
Feverfew	Parthenolide, tanetin	Inhibits release of prostaglandins and serotonin
<i>Glycyrrhiza inflata</i>	Licochalcone A	Inhibits keratinocytes release of prostaglandins in response to UVB-induced erythema

polyphenols, such as epicatechin, epicatechin-3-gallate, epigallocatechin, and epigallocatechin-3-gallate. The term *green tea* refers to the manufacture of the botanical extract from fresh leaves of the green tea plant by steaming and drying at elevated temperatures, avoiding oxidation and polymerization of the polyphenolic components.

A study by Katiyar et al,¹ demonstrated the anti-inflammatory effects of topical green tea application on C3H mice. A second study by the same authors found topically applied green tea extract containing epigallocatechin-3-gallate reduced UVB-induced inflammation as measured by double skin-fold swelling.² Currently, green tea extracts are the most commonly used cosmeceutical botanical anti-inflammatory.

Aloe Vera

The second most commonly used anti-inflammatory botanical is aloe vera. The mucilage is released from the plant leaves as a colorless gel and contains 99.5% water and a complex mixture of mucopolysaccharides, amino acids, hydroxy quinone glycosides, and minerals. Compounds isolated from aloe vera juice include aloin, aloe emodin, aletinic acid, choline, and choline salicylate. The reported cutaneous effects of aloe vera relevant to rosacea include reduced inflammation, decreased skin bacterial colonization, and enhanced wound healing. The anti-inflammatory effects of aloe vera may result from its ability to inhibit cyclooxygenase as part of the arachidonic acid pathway through the choline salicylate component of the aloe vera juice. However, the final concentration of aloe vera in any moisturizer must be at least 10% to achieve a cosmeceutical effect relevant to the rosacea patient.

Most of the aloe vera that is used in cosmeceuticals is purchased in the powder form. It is for this reason that it does not have the mucilage effects previously described. Aloe vera is very expensive when added to products in the amount required to achieve a physiologic benefit. Lower-priced moisturizers that contain aloe vera usually do not make claims related to the addition of aloe vera. It is important to remember that if the packaging uses the phrase *contains aloe vera*, it is only a statement to promote the ingredients and does not imply the functionality of the aloe vera. In other words, the phrase only indicates what is in the bottle and not the amount or the physiologic benefits of aloe vera.

Allantoin

Allantoin is the oldest anti-inflammatory ingredient and is added to many moisturizers that are marketed for sensitive skin. Allantoin is naturally found in the

comfrey root, but is usually synthesized by the alkaline oxidation of uric acid in a cold environment. Allantoin is a white crystalline powder readily soluble in hot water, which makes it easy to add to formulations of cream and lotion moisturizers that are designed for sensitive skin. Allantoin is listed in the skin protectant monograph, which may facilitate redness reduction by improving the skin barrier.

Most commercially available allantoin is chemically synthesized and does not come from the botanical source of the comfrey root. Because allantoin is chemically synthesized, attention is drawn to the claims made for many *natural* botanical products that are sold as appropriate for patients with rosacea and sensitive skin. Consumers' assumptions are that naturally-derived products will produce more skin improvement and less irritation. There is currently no consistent definition in the skin care industry as to what the term *natural* truly means. Thus, claiming that a product is *natural* must be viewed as marketing jargon because it does not provide any meaningful information about the product's effect on the skin of rosacea patients.

Feverfew

Feverfew is a small bush with citrus-scented leaves that are used as traditional medicinal herbs. Feverfew has been used to treat headaches, arthritis, and digestive problems. The anti-inflammatory benefits of this plant have been attributed to parthenolide and tanetin, which are thought to decrease the release of serotonin and prostaglandins. Feverfew also induces vasoconstriction; therefore, the reduction in inflammation and blood flow may allow feverfew to reduce redness in rosacea.

A moisturizer that reduces redness resulting from rosacea was introduced based on parthenolide-free feverfew. Parthenolide is a known cause of allergic contact dermatitis, thus the ability to synthesize parthenolide-free feverfew was necessary before this ingredient could be used in products for sensitive skin.

Glycyrrhiza Inflata

Glycyrrhiza inflata is a member of the licorice family and is known for containing a variety of anti-inflammatory botanicals. One extract isolated by heating from the root of the *G inflata* licorice plant is licochalcone A, which possesses anti-inflammatory properties as evidenced in its in vitro ability to inhibit the keratinocytes release of prostaglandin E₂ in response to UVB-induced erythema and the lipopolysaccharide-induced release of prostaglandin E₂ by adult dermal fibroblasts. Licochalcone A is the active agent in one of the

COSMETIC CONSULTATION

largest product lines currently sold internationally for redness reduction.

Summary

Cosmetics and cosmeceuticals may be useful in patients who are looking for ancillary products to complement their prescription therapies for rosacea. For reducing facial redness, cosmeceuticals such as botanical moisturizers may be helpful in some patients. Cosmetics for camouflaging redness may be necessary in some patients who require 4 to 8 weeks of treatment before perceiving a reduction in redness. It is also worthwhile to understand the ingredients and the intended functionality of products that are specifically marketed to persons with facial redness resulting from rosacea.

The market targeted toward reducing facial redness resulting from rosacea has become a new niche at the cosmetic counter. Some products for reducing redness contain hydrocortisone as the active agent, which is

an ingredient of interest to dermatologists who may have rosacea patients with concomitant perioral or periorcular dermatitis.

The newest frontier in products for reducing facial redness resulting from rosacea will be the use of antimicrobial peptides, which can be incorporated into cosmeceuticals. These peptides can modulate facial inflammation and have the potential to offer effective redness reduction. At present, antimicrobial peptides are not in any nationally marketed products; however, more innovation is certainly to be expected in this newly discovered skin care niche.

References

1. Katiyar SK, Ahmad N, Mukhtar H. Green tea and skin. *Arch Dermatol.* 2000;136:989-994.
2. Katiyar SK, Elmets CA, Agarwal R, et al. Protection against ultraviolet-B radiation-induced local and systemic suppression of contact hypersensitivity and edema responses in C3H/HeN mice by green tea polyphenols. *Photochem Photobiol.* 1995;62:855-861. ■