Sorting Through the Claims of Topical Botanical Anti-inflammatory Agents

Some promising evidence supports the benefit of botanical anti-inflammatory agents, but there's still more to learn.

By Dee Anna Glaser, MD

As the offerings in non-prescription skin care continue to grow, manufacturers have turned to botanical additives in hopes of boosting their efficacy and marketability—thus setting their products apart. Numerous botanical agents are added to various skin care products to potentially confer any number of benefits. Sometimes, botanicals are said to reduce wrinkles, lighten uneven pigmentation, enhance photoprotection, or (as package labeling sometimes vaguely states) to "protect and nourish." Additionally, many botanical agents are credited with anti-inflammatory properties. With anti-inflammatory processes and responses implicated in cutaneous aging, effective topical anti-inflammatory agents would seem beneficial in preserving a youthful appearance. Evidence suggests that some botanical agents do, in fact, help to block the inflammatory changes that may result in cutaneous aging, and thus they are purported to reverse the signs of aging when applied topically.

Below, I will review what we know about the anti-inflammatory action of some popular botanical additives. In future columns, I will address additional cosmeceutical ingredients and their purported benefits.

Allantoin

Allantoin is a popular botanical anti-inflammatory additive, although most allantoin used in skin care products today is not plant derived. Instead, it is manufactured by the alkaline oxidation of uric acid. As a skin care additive, allantoin is credited with promoting photodamage repair, inducing cell proliferation, and reducing inflammation induced by UVR.

Aloe Vera

Perhaps the best known botanical anti-inflammatory agent, aloe vera is popularly used to soothe both UV-induced and heat-induced burns. Comprised primarily of water (99.5%), the colorless gel released from plant leaves contains a complex mixture of mucopolysaccharides, amino acids, and minerals. Several distinct compounds have been isolated from aloe vera juice, including aletinic acid, aloe-emodin, aloin, and choline salicylate. Aloe vera has been shown to inhibit cyclooxygenase within the arachidonic acid pathway. This is largely considered the basis—at least in part—of the compound's anti-inflammatory effect, though there are different theories about the mechanism of action.

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In order to confer anti-inflammatory effect, estimates suggest that the concentration of aloe vera must be at least 10 percent. It's important to note that most skin care products use the powder form of aloe vera, which may not be equivalent to the fluid extracted from the plant's leaf.

Ginkgo biloba

Among other proposed actions, ginkgo biloba ingested orally is touted to boost memory and is a popular dietary supplement. The antioxidant extract of the

ginkgo tree leaf is also credited with providing cutaneous benefits when applied topically. Ginkgo biloba leaves contain unique polyphenols, flavonoids, and flavonol glycosides. In vitro studies demonstrate an effect on human skin fibroblast proliferation with increased synthesis of collagen and extracellular fibronectin.1 Products promoting the addition of ginkgo biloba usually claim to provide antioxidant properties as well as to boost collagen synthesis.

Green tea extract

Green tea extract is a popular botanical whose antioxidant properties continue to generate interest for everything from promoting weight loss to curing cancer. It is available as an oral supplement or formulated into topical products. A steaming and drying process is used to draw the extract from the plant.

If green tea extract is used as an additive to a topical preparation, the formulation must contain an antioxidant such as butylated hydroxytoluene that will stabilize the green tea. The extract has been shown to protect against UV-induced edema and erythema. If applied to the skin prior to UV exposure, green tea polyphenols have been shown to decrease the formation of cyclobutane pyrimidine dimmers, which are felt to play an important role in initiating UV-induced mutagenesis and carcinogenesis.[1]

From Lab to Clinic

Though the science to support the potential anti-inflammatory and therefore anti-aging benefits of these botanicals is promising, the benefit of botanicals as formulated into currently available products is not as clear. For the most part, patients and physicians should view these agents as potentially helpful. Generally, patients seeking significant improvement in the appearance of photodamage through use of topical agents will require a prescription retinoid, though the adjunctive use of botanical-containing moisturizers and cleansers may be acceptable.

Several cleansers and moisturizers containing green-tea extract are now marketed for rosacea. So long as patients are using the appropriate pharmaceutical agents, the additional use of green-tea containing products may be reasonable.

The bottom line may come down to cost. Assuming that a skincare product meets all the usual criteria a dermatologist might propose (trusted manufacturer, non-comedogenic, non-irritating, etc.), patients may choose to try products that contain botanicals, knowing that their effects will be subtle, not dramatic. As long as patients are not paying excessive costs simply for the addition of botanical agents, then a trial of the product may be warranted.

1. Draelos ZD. Botanical Antioxidants. Cosmetic Dermatology September 2003, 16(9) 46-49.
2. Del Rosso JQ. Understanding skin cleansers and moisturizers: the correlation of formulation science with the art of clinical use. Cosmetic Dermatology November 2003 16(11)19-31.
3. Lupo M: A Review of Vitamins in OTC Skin Products. Cosmetic Dermatology 14:33-35, 2001.

New in Your Practice

Strength in a Bottle. PCA recently expanded its PCA Men skincare line with Total Strength Line & Pore Minimizer, a combination of the tetrapeptide Matrixyl 3000, epidermal growth factors, milk thistle extract, and pure hyaluronic acid that might be right for your patients. This combination works to strengthen men's skin, reducing wrinkles and skin laxity, says the company. Patients may notice smoother, denser, and firmer looking skin and can use the product alone or as part of the 1-2-3 daily PCA Men regimen, the company says.

Damage Control. A twice-daily application of 0.1% kinetin moisturizing cream (Valeant) in combination with daily SPF30 sunscreen use appears to be an effective and tolerable intervention for mild-to-moderate photodamage of the face and neck, says a study presented at Academy '05 in Chicago. Ultrasound scanning showed 11 of 18 patients had increased low density collagen during the 24 week study, while complexion analysis also showed 89 percent of patients had significant reduction in UV spots and 89 percent had significant reduction in porphyrins.

Eye. Eye. Eye. For patients looking to reduce under eye puffiness and stimulate wrinkle-reducing collagen production, consider PCA Skin's newest triple-action peptide eye formula pHaze12 eyeXellence. The cream-based formula combines dipeptide-2, palmitoyl tetrapeptide-3, and palmitoyl pentapeptide with licorice extract and Chinese herbs ginseng and jiaogulin to brighten and tighten the delicate eye area without causing irritation or redness.

Dry Spells. Repeated Botox (botulinum toxin A, Allergan) treatments for primary axillary hyperhidrosis (up to two years) appears to be safe and effective, but a majority of patients will not require repeat treatments for up to eight months. That's according to interim data from a long-term study presented at Academy '05. Treatment produced durable and consistent reductions of at least 75 percent in sweat production with each repeated treatment. At least half of patients who respond to treatment may not require a second treatment for seven to eight months. • Patients with severe hyperhidrosis (HDSS score of 3 or 4) are approximately 4.9 percent less productive than healthy coworkers and are most affected in work performance related to physical demands and mental/interpersonal demands, according to another study. The study notes that work debilitation resulting from severe hyperhidrosis is comparable to the work limitations associated with chronic conditions such as osteoarthritis, depression, and rheumatoid arthritis.