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Selected active naturals for atopic dermatitis: Atopic Dermatitis Part 1

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Abstract The desire for naturally derived agents is a growing trend for patients, physicians, and pharmaceutical companies. Studies indicate that complementary and alternative medicine is often used by patients and parents of children with atopic dermatitis, not necessarily with beneficial results. A half-dozen natural agents (ie, topical agents: coconut oil, colloidal oatmeal, sunflower oil, mustard oil, glycerin, and oral Chinese herbal therapy) are discussed because they have become popular for their expected activity in the therapy of atopic dermatitis. A critical review of the published literature on these agents is presented with specific focus on potential such side effects as hepatotoxicity with Chinese herbals.

Introduction

Atopic dermatitis is a skin condition associated with sensitivity and increased risk of sensitization to agents applied to the skin. Due to the reported side effects of chronic therapy with topical corticosteroids and topical calcineurin inhibitors,[1,2] as well as parent-perceived risks of applying synthetic emollients to the skin, there has been a growing movement among patients, parents, and practitioners to seek out adjunctive therapeutics with natural sourcing such that they would not be expected to be allergenic or biologically harmful or to accumulate toxic metabolites. Foods, especially derivatives of fruits, vegetables, and nuts, are often used in this setting due to the inherent safety of absorption of ingested agents. Despite desire in the lay public, data are often limited for these agents. As a result, the lay public is often subject to fads and hype in marketing. This review addresses six agents with literature documenting efficacy and safety profiles (including risks with some agents)—specifically, topical agents: coconut oil, colloidal oatmeal, sunflower oil, mustard oil, glycerin, and oral Chinese herbal therapy. All food-based therapeutics run a risk of allergen exposure in sensitized individuals, and care should be exerted in the setting of multiple food allergies. Dietary (oral) supplements for atopic dermatitis have recently been addressed in a Cochrane review with a finding of no recommendation for any supplements.[3]

Coconut oil

Coconut is a well-liked agent, because it is natural—it is a drupe or indehiscent fruit, growing on trees and containing many ingredients that are beneficial for skin, hair, and nails. *Copra* is the name for the fresh coconut. Virgin coconut oil (fresh coconut oil) is rich in vitamin E and medium-chain fatty acids, such as lauric acid, myristic acid, caprylic acid, capric acid, caproic acid, and other fats, including palmitic acid, oleic acid, palmitoleic acid, linoleic acid, linolenic acid, and stearic acid.[4] The benefits of coconut oil in xerosis are comparable to mineral oil, with a trend to superiority and good safety including no major pH alterations; however, the benefit in xerosis,

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associated with atopic dermatitis, may indicate the clear superiority of virgin coconut oil (VCO).[5]

In the past 3 years, there has been publication of studies documenting the benefit of topical VCO for xerosis and atopic dermatitis. A trial in the Philippines addressed the benefit of virgin coconut oil versus mineral oil for atopic dermatitis, using transepidermal water loss, the Scoring Atopic Dermatitis (SCORAD) index, and skin capacitance in mild to moderate AD. The study addressed patients at baseline, 2, 4, and 8 weeks. A total of 117 patients were analyzed. SCORAD decreased 68.23% versus 38.13% in the coconut oil versus mineral oil groups, respectively. For the coconut oil group, 47% achieved moderate improvement and 46% excellent improvement versus 34% and 19% in the mineral oil group. Improvement in transepidermal water loss was greater with VCO as well.[6]

The effect of VCO and virgin olive oil on *Staphylococcus aureus* in AD was compared in a 2008 study of 26 patients. After 4 weeks, colonization with staphylococci dropped from 20 patients with colonies to 1 in the VCO group (5%) and from 12 baseline positives to 6 in the virgin olive oil group (50%). The study suggests that coconut oil may be an effective agent in the setting of AD with staphylococcal colonization.[7]

Colloidal oatmeal

Colloidal oatmeal has been long described as a skin protectant, being used as a bath additive before vaccination for varicella relief, with reports in the literature as early as 1959 of benefit for atopic dermatitis in children.[8] In the past decade, oats (avena sativa) have been refined and extracted in more therapeutic ways, creating extracts that produce biologic benefits in atopic dermatitis and particular benefit as steroid-sparing agents in AD.[9,10] A variety of companies have marketed colloidal oatmeal creams for AD, and patients often express benefit, and particularly enjoyment, of these mid-weight products for their texture. Like coconut, oats contain many beneficial ingredients, especially the polyphenolic antioxidant avenanthramides,[11] which may reduce inflammation via inhibition of degradation of nuclear factor kappa beta (NF-KB), decrease keratinocyte phosphorylation and activation of NF-KB, and reduce histamine release and release of some proinflammatory cytokines (e.g. IL-8).[12–14] On a cellular level, avenanthramides are noted to work as antioxidants and as antigenotoxic agents.[15] In addition, enhancement of skin barrier formation at a genetic level may occur in the setting of xerosis as would be noted in AD.[16] The benefits of avena sativa on atopic dermatitis have been addressed in a few clinical trials, which have indicated benefit in a wide age group on eczema severity scores (eg, Eczema Area and Severity Index) and quality of life.[17]

Sunflower oil

Sunflower oil is often considered as a skin care product due to its beneficial fat content; that is, it is largely a triglyceride with a linoleic–to–oleic acid content of 2:1 and the combination accounting for about 90% of the oil. It is also high in vitamin E content and may activate the peroxisome proliferator–activated receptor α pathway.[18,19] Sunflower oil has been reported to have benefit in a variety of ways in the therapy and prevention of atopic dermatitis and associated conditions. First, sunflower oil has a beneficial effect on the skin barrier in adults with AD, with notable superiority to olive oil, which may have some detrimental effects on skin barrier.[20] Our group has reported the benefit on dermatoscopic features of the skin, Children's Dermatology Life Quality Index and Eczema Area and Severity Index scores, and Investigator's Global Assessment when sunflower oil oleodistillate cream was added to a regimen of topical steroids for atopic dermatitis.[21] A clinical trial of a cream containing a sunflower oleodistillate found that applications twice daily produced steroid sparing.[22] A recent international study addressed early introduction of daily emollient therapy for prevention of atopic dermatitis in infants at high risk genetically. Sunflower oil was included as one of the offered emollients. The study was successful and reported about a 50% reduction in AD at 6 months.[23]

Mustard oil

Historically, mustard gas has been used as a biowarfare agent and topical nitrogen mustard has been used to treat mycosis fungoides as a chemotherapeutic agent. Recently, emerging data indicate that mustard oil aggravates pruritus due to release of substance P in the skin causing itching, burning, and pain; therefore, this agent, though natural, is not advised for the treatment of atopic dermatitis.[24]

Glycerin (synonym: glycerol)

Glycerin-based emollients have demonstrable benefits in the treatment of xerosis and xerosis in the setting of atopic dermatitis.[25] Glycerin can be derived naturally from animal and vegetable (eg, palm, soy) triglycerides or synthetically. Triglycerides are esters of glycerol.[26] Glycerols can reduce interleukin 4 expression, which may affect atopic dermatitis disease through the T helper type 2 pathway and, theoretically, via reduced stimulation of B-cell production of immunoglobulin E.[27] Proprietary glycerin-based emollients (in this case mixed in paraffin) have produced improvements in the xerosis component of AD in children aged 2 to 6 years.[28] On a basic scientific level, the mechanism of glycerol and water movement through the skin barrier has been reported to be mediated via aquaporins. Glycerol-based topical agents will enhance stratum corneum hydration.[29] Therefore, this ingredient is often added to products intended for patient with atopic dermatitis to increase epidermal hydration.

Chinese herbal therapy

Chinese herbal therapy appeared to have promising results[30–32] when initially presented in the Western literature 2 decades ago as a therapy for atopic dermatitis. Since then, the landscape has shifted. It is clear there are cases of hepatotoxicity,[33] and there have been reported deaths in Chinese herbal therapy trials for atopic dermatitis. Despite this, ongoing research looks at the potential of specific components of these therapies as possible atopic dermatitis therapies. Unfortunately, patients continue to seek these agents as a therapeutic option, making understanding of these herbal regimens of importance to dermatologists.[34] Chinese herbals may suppress release of certain proinflammatory cytokines and chemokines.[35,36] Placebo-controlled trials adding Chinese herbal extracts to traditional therapy for moderate atopic dermatitis indicate significantly better improvement with the addition of herbal therapy.[37] Chinese herbals may in some settings be steroid-sparing agents.[36] The current issue with Chinese/Asian herbal therapies is that they appear to be active, but the exact combination that is best and the long-term safety profiles of the combination chosen for ongoing use have yet to be determined.

Conclusions

There are many active natural agents available for topical and oral use that have a truly beneficial effect in atopic dermatitis. Adjunctive usage and determining how to integrate natural agents in the treatment paradigm is part of the clinician's decision; however, it appears that natural options with proven outcomes are available to the physician, parent, and patient and that these can be integrated into a successful treatment plan.

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