

Editorial

The Role of Nutrition in Dermatology

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Received: May 16, 2017; **Accepted:** May 25, 2017;**Published:** June 07, 2017

Editorial

Nutrition plays a significant role in the overall health of humans. Skin health can be affected in a positive or negative way by the foods we consume [1-3]. With the growth in research of how diet and nutrition impact skin conditions, our understanding of nutritional influences in dermatology has grown as well. We explore the relationship between nutrition and common skin disorders, such as acne and atopic dermatitis.

Acne

Acne vulgaris is a common skin condition that affects 40-50 million people in the United States [4]. Several studies have evaluated the role of diet in acne. Specifically, dairy products, green tea, turmeric, and other foods appear to affect acne. In particular, the relationship between milk and acne has been studied more compared to other foods.

Based on available studies, it appears that skim milk can have a negative impact on acne [5-7]. Several epidemiological studies collected dietary intake from adolescents and young adults and found that overall, milk intake correlated with a higher prevalence of acne [8-10]. A few studies did not report any significant findings associated with acne and milk consumption [11,12]. Case reports suggest that bovine milk whey protein may stimulate the formation of acne lesions as its discontinuation improved acne and restarting supplementation worsened acne [13-15]. On the other hand, some components of milk may be beneficial. Lactoferrin is a component of whey milk and was found to have a positive impact on acne [16]. More prospective studies are needed to understand how milk and its subcomponents affect acne.

A high glycemic load was correlated with acne based on findings from a study among young adults [17]. High glycemic load leads to an elevated insulin level, which stimulates synthesis of androgen hormones. Androgens act on the oil glands in the skin by increasing oil (sebum) production, which contributes to the development of acne. Additionally, excess oil provides an ideal environment for proliferation of *Propionibacterium acnes*, bacteria involved in acne pathogenesis [18]. Chocolate is a common food known to have a high glycemic load. A few studies have suggested that acne can be exacerbated by the consumption of milk or dark chocolate [19,20]. However, in a randomized crossover study comparing the effects of

milk chocolate versus non-chocolate candy with a similar glycemic index, chocolate consumption led to a significant increase in acne lesions while non-chocolate candy did not [19]. This study is limited by a small sample size, thus future studies of high quality and larger study size are needed. Nevertheless, since chocolate does contain milk, there could be a potential link between the consumption of chocolate and acne [20].

There are data suggesting that nutrition (e.g. Paleolithic diet or consumption of tea, turmeric, or omega-3-fatty acids) can improve acne. The Paleolithic diet, which emphasizes fruits, vegetables, grass-fed meat, nuts, and healthy fats, has been suggested to be an ideal diet to prevent acne and help alleviate acne vulgaris in affected individuals [21,22]. Tea, a beverage commonly consumed worldwide, contains polyphenols, which are antioxidant molecules with antimicrobial and anti-inflammatory properties [23]. Some studies have suggested that tea polyphenols reduce overall sebum production and thus can help treat acne [23-29]. Compared to other types of tea, green tea has the highest polyphenolic content [30]. Turmeric (*Curcuma longa*) is a spice that also has anti-inflammatory effects; it is utilized worldwide for cooking, and medicinal remedies, among others [31]. In addition to exerting its anti-inflammatory effects on *Propionibacterium acnes*, turmeric has been found to improve acne when part of a formulation [32,33]. However, more studies that isolate the effects of turmeric on acne are needed. Lastly, omega-3 fatty acids have been observed to improve and reduce acne lesions [34-36]. Although there is some evidence in support of nutrition in acne treatment, many studies are of low quality or have a small sample size. Therefore, there is a need for higher quality studies that evaluate various treatment options for acne vulgaris, with the focus on nutritional remedies.

Atopic dermatitis

Atopic dermatitis is a chronic inflammatory skin condition affecting individuals from all age groups. The role of foods and diet has been controversial. Patients with AD were given a low-energy vegetarian diet for two months [37]. There was a reduction of almost 50% in Scoring Atopic Dermatitis (SCORAD) after consuming this specific diet. There have been some studies that evaluated the role of trace minerals or vitamins and AD, however more research is needed in this area before a concrete relationship can be found [38-40]. Overall, our understanding of diet and atopic dermatitis is limited.

Psoriasis

Psoriasis is a chronic inflammatory skin condition that is associated with high body mass index. Obese patients were placed on an energy-restricted diet (high omega-3, low omega-6) and it was found that the Psoriasis Area and Severity Index (PASI) decreased by more than 50% after six months [41]. Studies suggest that a vegetarian diet may improve psoriasis [42-45].

Overweight and obesity related skin conditions

Obesity has been on the rise in the United States over the last 20 years and is defined as having a BMI over 30 [46]. There are several

skin conditions that are associated with being overweight or obese such as acanthosis nigricans, acne, acrochordons, skin infections, striae, hidradenitis suppurativa, hirsutism, keratosis pilaris, and delayed wound healing. Very few studies have directly studied the role of nutrition. Many of these skin conditions are correlated with a higher BMI. Individuals who are overweight or obese can benefit by making changes to their diet and lifestyle, and thus reducing the prevalence of skin conditions associated with weight.

Current evidence suggests that nutrition can play a beneficial role in addressing various dermatological conditions. There is a great need for a variety of nutrition-based studies that evaluate how food can help treat acne, atopic dermatitis, and many obesity related skin conditions. We hope that research continues to grow in this interesting area of dermatology.

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