Impact of Diet in Dermatology

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Disclosures

• I have no relevant disclosures

• I will mention off-label use of spironolactone for acne
Objectives

• Review the evidence on the role diet may play in various dermatologic conditions

• Discuss practical tips that patients can use to make dietary changes
Why is this important?

- Patients frequently believe that their skin diseases are caused by diet.

In one study, 95% of parents of children with atopic dermatitis believed that their children had food allergies, and that these food allergies exacerbated the AD.
Why is this important?

- Dietary modifications may improve patient outcomes for some conditions.

In one study, participants who followed low glycemic-load diet for 12 weeks showed improvement in their acne.
“We tried everything, including top dermatologists, antibiotics, special facials, blue light therapy, and prescription skincare products.”

How We Cured Our Cystic Acne With One Simple Diet Change
forksoverknives.com
Why is this important?

• Addressing diet as part of a treatment plan shows that you are taking a holistic approach, treating the patient as a whole person
Overview

- Acne
- Atopic dermatitis
- Urticaria
- Psoriasis
- Anti-aging
Diet and Acne
Diet and Acne: History

• 1940’s-50’s Many Derm textbooks discouraged dietary fats and sweets as part of acne therapy

• 1960’s study by Fulton et al., 65 patients
  • Chocolate vs placebo over a 4 week period
  • Placebo bar had similar sugar and fat content as chocolate bar
  • No difference in acne severity
  • Based on this research, many concluded that diet did not impact acne
Diet & Acne: History

• More recent research has provided strong support that diet DOES play a role in acne
Are there any places in the world where acne does not exist?

• Kitavan Islanders of Papua New Guinea
• Ache hunter/gatherers in Paraguay

Diets: minimally processed plant and animal foods
• In 1990, Dr. Staffan Lindeberg visited 494 houses on Kitava and performed a health exam on more than 1000 people; 25% 15-25 years old
• Not a single case of acne was observed!
• Other Pacific Islanders have similar ethnic backgrounds but more Westernized cultures and acne is prevalent
• Therefore thought to be due to diet/lifestyle and not genetics
Kitava Island Diet

- Root vegetables:
  - Yam
  - Sweet potato
- Vegetables
- Fruits
- Fish
- Coconuts
- Less than 0.2% caloric intake from dairy, sugar, cereals, alcohol
Ache Hunter-Gatherer Diet

• 80% meat (armadillo, tapir, monkey, etc)
• 10% palm starch and hearts
• 10% insect larvae and honey
• 1% fruits
Is a “Western diet” (typically a high glycemic index/load diet) the problem?
What is the Glycemic Index/Load (GI/GL)?

- Glycemic index (GI): a numeric system that measures the rise in blood sugar following consumption of a carbohydrate

- Glycemic load (GL): glycemic index and portion size
High Glycemic Index

- Sugar
- White bread
- White rice
- White potatoes
Low Glycemic Index

- Most vegetables
- Many fruits, like berries and cherries
- Oatmeal (not quick oats!)
- Sweet potatoes
- Legumes and lentils
Glycemic index and Acne

• High GI/GL diet leads to insulin & IGF-1

• IGF-1 stimulates:
  – Keratinocyte proliferation
  – Sebocyte proliferation/sebum production
  – Adrenal androgen synthesis
How Can I Explain This to Patients?

• Sugars and refined grains cause spikes in your blood sugar that lead to increased oil production, elevated androgen hormones, and inflammation

• These things can all make acne worse!
Low Glycemic-Load Diet & Acne

• Smith et al. JAAD 2007
• 12 week randomized controlled trial
• Men ages 15-25
• High protein, low glycemic-load diet vs. conventional high-glycemic load diet
• Matched calories
• All participants used Cetaphil cleanser
Low Glycemic-Load Diet & Acne

• Compared with the HGL group, the LGL group showed significant reductions in:
  
  – Acne lesion count
  – Weight (despite equal caloric intake)
  – Testosterone bioavailability
Low Glycemic-Load Diet & Acne

• “First study to demonstrate a therapeutic effect of dietary intervention on acne.”
Milk and Acne

- Milk also elevates insulin and IGF-1 levels
- Contains bovine IGF-1
- Contains dihydroxytestosterone (DHT) precursors
Milk and Acne

• Several large studies have found an association between acne and frequent consumption of milk
Whey protein precipitating moderate to severe acne flares in 5 teenaged athletes.

Silverberg NB1.

Abstract
Acne vulgaris has been linked to milk ingestion, both whole and skim milk. The milk fraction that promotes acne is unknown. Five case reports are presented of male patients aged 14 to 18 years who experienced onset of acne shortly after initiation of whey protein supplementation; 3 teenagers used the supplement for muscle building in football training and the other 2 for attempting to gain weight. All 5 patients had poor response to acne treatment regimens of oral antibiotics, topical retinoids, and benzoyl peroxide. Lesions fully cleared in 4 patients after discontinuation of whey protein supplementation, but 1 patient's acne flared after reinitiation of the whey protein supplement. Two patients did not immediately discontinue whey protein supplementation; 1 of them cleared after he discontinued whey protein during his second course of isotretinoin and 1 was lost to follow-up. Among these patients, at least 6 different brands of whey protein supplementation had been used, including whey protein shakes and reconstituted powders. Whey protein may be the fraction of dairy products that promote acne formation. Larger studies are needed to determine the mechanism of comedogenesis.
Spearment Tea & Acne?

• Study on PCOS patients with hirsutism
• Spearmint tea twice daily for 30 days
• Androgen levels decreased (study length too short to see significant difference with hirsutism)
• Conclusion: Spearmint tea has antiandrogen properties
Spearmint Tea & Acne?

• May be an alternative to spironolactone for women with hormonal acne who are seeking a “natural” approach
Dietary Exclusion and Food Allergy

- 2008 Cochrane review, including 6 studies on milk and egg exclusion
- NO significant benefit from exclusion diets in “unselected patients”
- For patients with positive egg-specific IgE, an egg-free diet improved atopic dermatitis
How is a Food Allergy Diagnosed?

• History, skin prick test, serum IgE testing are not diagnostic
• Food challenge in a supervised medical setting is the best
• If the challenge does not elicit symptoms, and allergy to that food is not present
• A food allergy is confirmed if challenge elicits symptoms that correlate with medical history, blood tests, and skin prick results
Food Allergy and Atopic Dermatitis

• For patients with a proven food allergy, elimination diets are appropriate and may decrease severity of atopic dermatitis

• For patients without a proven food allergy, no need to try elimination diets
  – No evidence that diet will help dermatitis
  – Restrictive diets may cause nutritional deficiencies, etc.
Maternal Diet & Breastfeeding

• Maternal allergen avoidance during pregnancy and breastfeeding does NOT prevent atopic dermatitis

• For high risk infants, exclusive breastfeeding for 4 months is protective against atopic dermatitis

• For infants in the general population, breastfeeding is not protective for atopic dermatitis
Pre-/Probiotics and Atopic Dermatitis

• Prebiotic supplementation in infants has been shown to reduce risk of atopic dermatitis
• Probiotic supplementation in infants AND in moms during pregnancy has a protective effect for atopic dermatitis
Other Supplements and AD

• Insufficient data for conclusive recommendation for supplementation with Vitamin D, fish oil, zinc, vitamin E, etc.
Practical Tips

• If patients or parents believe that certain foods lead to flares of atopic dermatitis, it is helpful to work in conjunction with an allergist.

• For women with atopy who are trying to conceive, consider a probiotic supplement.

• For infants who have a family history of atopy, consider a prebiotic or probiotic.
Diet and Chronic Urticaria
Foods & Histamine

• **Foods high in histamine:**
  - Tofu
  - Soy Sauce
  - Aged cheese (blue, Parmesean)
  - Canned/smoked fish
  - Sausage, salami
  - Champagne, beer, wine
  - Sauerkraut
  - Eggplant
  - Vinegar, mayonnaise

• **Foods that stimulate your body to release histamine:**
  - Egg whites
  - Citrus fruits
  - Strawberries
  - Chocolate
  - Seafood, shellfish
  - Alcohol
  - Milk
  - Nuts

From *Feed Your Face*, by Jessica Wu, M.D.
Pseudoallergens

- Preservatives, dyes, and aromatic compounds in foods are thought to induce hypersensitivity reactions that may aggravate chronic urticaria
- IgE antibodies absent
- Skin prick testing often negative
Pseudoallergens

• Preservatives or artificial colors
• Sweeteners
• Spices and herbs (except salt and chives)
• Herbal tea, soda
• Smoked meats/fish
• Chewing gum, candy
• Mayonnaise
• Etc.
Pseudoallergen-Free Diet

• Use only fresh foods
• No preserved foods (except those deep-frozen without any additives)
• No food additives or dyes
• No foods rich in aromatic compounds such as tomatoes
Pseudoallergen-free diet

- In several studies, pseudoallergen-free diets improved symptoms for some patients with chronic urticaria

- Safe and low cost

Diet and Psoriasis
Weight Loss and Psoriasis

- Diet and exercise decrease PASI score
- Bariatric surgery-induced weight loss has been reported to improve psoriasis
Alcohol and Psoriasis

- Alcohol abuse positively correlates with psoriasis severity
Gluten and Psoriasis

• For psoriasis patients with antibodies to gliadin, a gluten-free diet improves psoriasis.
Supplements and Psoriasis

Polyunsaturated fatty acids (*omega 3 fatty acids* EPA and DHA) may decrease inflammation and improve psoriasis symptoms, but fish and fish oil studies have had inconsistent results.
Supplements and Psoriasis

• Observational studies have shown efficacy of oral Vit D supplements for psoriasis, but a recent RCT found no significant difference in skin lesions with oral Vit D compared to controls.
Summary: Diet and Psoriasis

- Encourage weight loss if appropriate
- Screen for alcohol abuse
- Consider screening for celiac disease
- Evidence for Vitamin D, EPA/DHA supplementation is lacking
Diet and Anti-Aging
High serum glucose levels are associated with a higher perceived age

Raymond Noordam • David A. Gunn • Cyrena C. Tomlin • Andrea B. Maier • Simon P. Mooijaart • P. Eline Slagboom • Rudi G. J. Westendorp • Anton J. M. de Craen • Diana van Heemst • On behalf of the Leiden Longevity Study Group
Serum Glucose & Perceived Age

- Perceived age assessed using facial photos
- Non-fasting glucose and insulin levels measured
- For diabetic and non-diabetic subjects, higher glucose levels were associated with higher perceived age
Diet and Anti-Aging

• Changes in collagen and elastic fibers lead to wrinkles and sagging skin

• Sugar has a negative impact on collagen
  – Cross-linking of collagen
  – Production of Advanced Glycosylation End-Products (AGEs)

• AGEs activate MMPs, which degrade collagen and other extracellular matrix proteins
Summary

• **Acne:** High glycemic load diet, dairy, whey protein can play a role in acne

• **Atopic dermatitis:**
  – For patients with a proven food allergy, elimination diets are appropriate and may decrease severity of atopic dermatitis.
  – Probiotic supplementation in infants AND in moms during pregnancy has a protective effect for atopic dermatitis
Summary

• **Urticaria:** Consider pseudoallergen-free diet

• **Psoriasis:** Encourage weight loss if appropriate, screen for alcohol abuse, consider screening for celiac disease

• **Anti-aging:** Sugar can accelerate signs of aging by promoting cross-linking of collagen fibers
IGF-1 stimulates all of the following EXCEPT:

A. Sebum production
B. Androgen synthesis
C. Elevation in serum blood glucose levels
D. Keratinocyte proliferation
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Which of the following has demonstrated antiandrogenic activity?

A. Dandelion tea
B. Spearmint tea
C. Whey protein
D. Echinacea
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If a patient with atopic dermatitis has a positive prick test to egg but an observed food challenge does not elicit symptoms, what is the most appropriate recommendation?

A. Egg-free diet
B. Normal diet
C. Prescription for injectable epinephrine pen
D. Restriction of eggs, milk, peanuts, and soy
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You are formulating a treatment plan for a patient with generalized plaque psoriasis and BMI 35. In addition to topical and systemic medications, what lifestyle modification would most likely benefit this patient?

A. Drinking green tea daily
B. Sun avoidance
C. Elimination of dairy from diet
D. Starting a weight loss program
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https://en.wikipedia.org/wiki/Ach%C3%A9_people

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