The Topical Nutritional Pyramid: A Method for Educating Patients on Skin-Rejuvenating Cosmeceuticals

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Nonprescription rejuvenating topical skin care products are widely used and available. Uncertainty regarding efficacy stems from lack of formal regulation of cosmeceuticals versus prescription skin care products. Yet, cosmeceuticals are a part of dermatology and are dispensed in physicians' offices. As the sophistication, diversity, and medical claims of nonprescription skin care products grow, patients want physicians' recommendations. Talking to patients about cosmeceuticals in a busy practice setting can be difficult. The topical nutritional pyramid, along with a companion guide detailing nonprescription topical skin care products offered in physicians' offices, may be used as educational aides to alleviate this quandary. Loosely based on the familiar food pyramid, the topical nutritional pyramid is an organized structure that classifies 8 cosmeceutical categories: sun protection, retinoids, vitamin antioxidants, α- and β-hydroxy acids, botanical antioxidants, growth factors, peptides, and tissue compounds. Products near the bottom of the pyramid have the most and strongest data to support their benefits on skin rejuvenation, and products near the top of the pyramid have less. With this framework, patients can be encouraged to, at a minimum, use sunscreens for skin health and progress logically to a more complicated skin "diet," if desired.

Whether the issue is pigmentation, wrinkles, acne, facial redness, oily or dry complexion, or simply the fear of looking old, the use of nonprescription skin care products to enhance the appearance of skin has become a mainstay of society and a legitimate aspect of dermatology.[1] Women make up the largest group of consumers, but this phenomenon is widespread, and nonprescription skin-rejuvenating cosmeceuticals are now the fastest-growing segment of the skin care market.[1-3]

Routinely, cosmeceuticals are marketed in the mass media and through celebrity endorsements to promote brand recognition. As the sophistication, diversity, and medical claims of the nonprescription skin care product industry expands, patients as consumers trust in physician

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expertise and seek advice from their dermatologists about which skin-rejuvenating products to purchase.[4]

It has been decades since Kligman[5] coined the term *cosmeceuticals* as a way to separate skin care products that have biological activity on the skin apart from cosmetics or other products simply intended to beautify or mask. Because many nonprescription topical skin care products (eg, α-hydroxy acids, retinoids, vitamin C) do have real skin effects and can cause adverse events, they have a legitimate place in dermatology, and today most dermatologists offer nonprescription topical skin care products for sale in their offices.[6] Nevertheless, the subject and sale of nonprescription topical skin care products in physicians' offices has been a topic of discussion and controversy for many years.[7-10]

The crux of the controversy stems from the fact that cosmeceuticals are not given the same rigorous oversight as prescription drugs, and because this burgeoning competitive industry can be confusing and laced with sensational promotions, the medical legitimacy of the real or purported mechanism of action of a given product can be circumspect. Critical information (sometimes lacking) includes not only disclosure of ingredients and consistency of manufacturing, but also skin-penetration capability and expiration data. Ideally, the antiaging claims of skin-rejuvenating formulations and their components should be demonstrated in controlled clinical trials, and product production should follow good manufacturing procedures. Although the ideal has not yet been achieved for all cosmeceuticals, there is encouragement that despite the lack of regulatory oversight, with the growth of the field and the steady efforts of scientifically minded investigators and skin-specialty company consultants, quality information is becoming more available.[1,11-19]

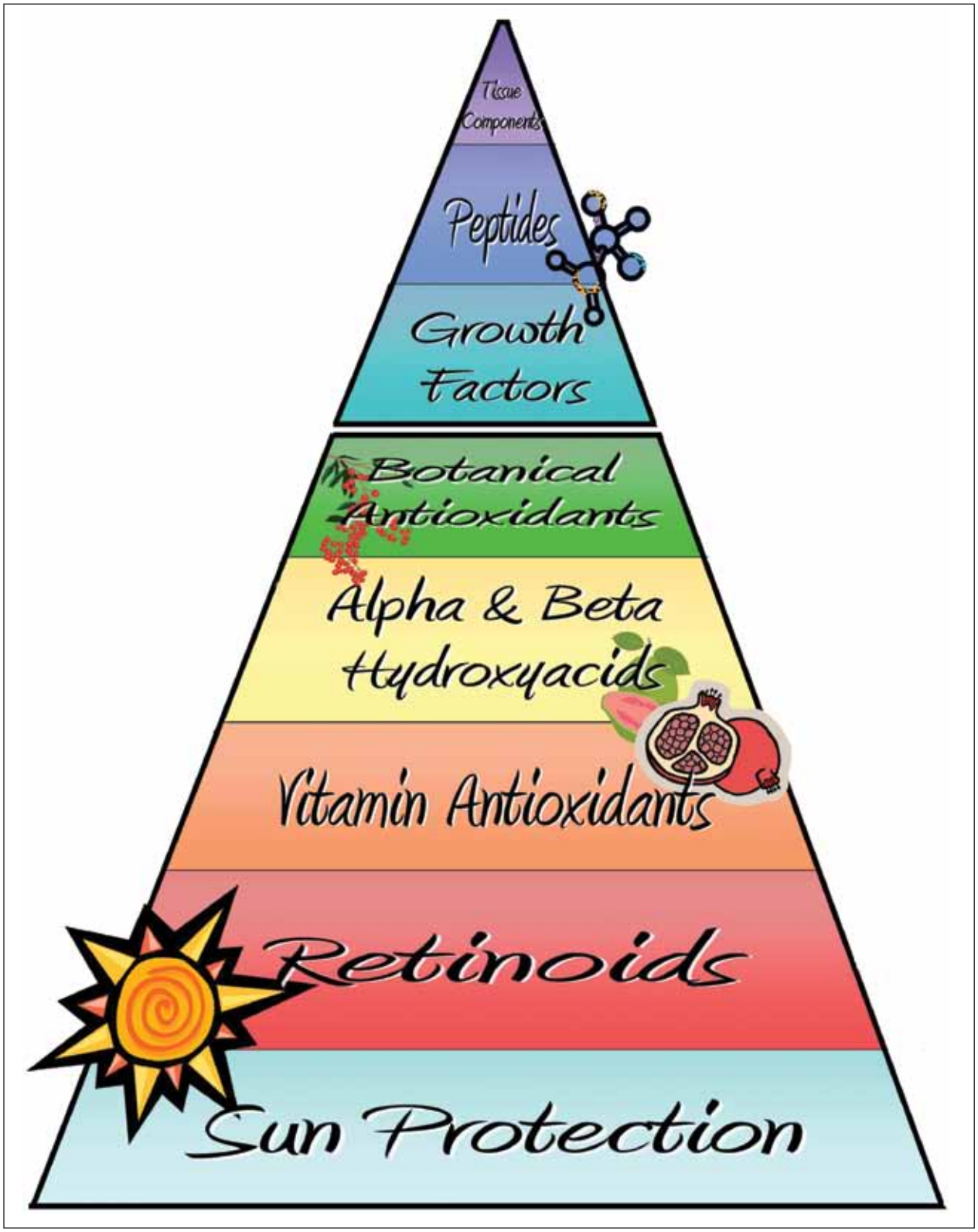
Discussing cosmeceuticals with patients in a busy general practice can be difficult. Apart from the sometimes limited scientific data and the plethora of product categories and choices, discussing the use of and recommending choices for the purchase of skin care products with patients can be time consuming and put physicians in the awkward role of salesperson, which may interfere with the patient-physician relationship. Accordingly, many physicians leave the discussion of cosmeceuticals with patients to other members of the office staff, including nurses, aestheticians, or office managers.[4]

COMMENT

The topical nutritional pyramid may offer a partial solution to some of the complexities surrounding the subject of dispensing cosmeceuticals in the office. This simple framework categorizes and describes 8 basic groups of topical skin-rejuvenating products, including sun protection, retinoids, vitamin antioxidants, α- and β-hydroxy acids, botanical antioxidants, growth factors, peptides, and tissue compounds (Figure). The topical nutritional pyramid serves to educate patients as consumers and provide a structure to both lay and medical personnel to manage the morass. Loosely fashioned after the food pyramid, the topical nutritional pyramid is designed to help patients make healthy choices for their skin diet. Product categories placed at the base of the topical nutritional pyramid are either more inherently valuable to skin health or are generally better-defined scientifically (eg, sunscreens, retinoids). Items less well studied or with more limited benefits are closer to the top of the pyramid (eg, peptides, tissue components). Accompanying each topical skin care product category is a brief explanation of the product function, how it may help skin, and how it is intended to be used (Table). Patients can be encouraged to start with a simple skin care regimen, or "menu," initially and progress to a more complex multicourse diet as desired.

With the basic educational framework provided, physicians can elect to carry specific products (based on available clinically-supported medical data) within several or all of the topical skin care product groups. As an educational aide, a clinic-specific companion guide to the topical nutritional pyramid can then be devised by the physician to give a more detailed explanation of the use of the paradigm as well as details regarding skin care products carried by that particular clinic within the specific cosmeceutical groupings corresponding to the topical nutritional pyramid. Special characteristics of the products (eg, water resistance, noncomedogenic, preferred by those with acne or rosacea, fragrance free, great for postmenopausal skin) can be included in the product description, as well as frequency of use or warnings (eg, should not be used during pregnancy, should be used with caution in those with sensitive or very thin skin). Two examples of descriptions that could be used in the companion guide to the topical nutrition pyramid are:

> *Sun Protection*—Excessive exposure to sunlight is the biggest cause of skin aging (look at the skin of your bottom to determine your skin's true age). Make sure your sunscreen blocks both UVA (the "aging rays"—approximately 90% of the UV rays, present any time there is light, can go through windows and cloud cover) and UVB (the "burning rays"). Wear sunscreens with a sun protection factor of 30 or higher every day, reapply often (sunscreens can be broken down by heat and light), and wear sun-protective clothing and eyewear.



Topical Nutritional Pyramid. Product categories placed at the base of the topical nutritional pyramid are either more inherently valuable to skin health or are generally better-defined scientifically (eg, sunscreens, retinoids). Items less well studied or with more limited benefits are closer to the top of the pyramid (eg, peptides, tissue components).
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Major Cosmeceutical Groupings Depicted in the Topical Nutritional Pyramid: Frequency of Use, Examples, and Mechanism of Action

Tissue Components

Use 1–2 times a day

Examples: collagen, hyaluronic acid, elastin

These products are basic components of healthy skin which become diminished with age

Better efficacy with injection; however, topical formulas are being actively studied

Peptides

Use 1–2 times a day

Examples: acetyl hexapeptide-3, palmitoyl pentapeptide-3, palmitoyl oligopeptide-3

Small fragments of full proteins function to stimulate skin repair after injury

Stimulate collagen and elastin production, diminish dynamic wrinkles

Data are limited, but show promise

Growth Factors

Use 1–2 times a day

Examples: β-NGF, EGF, FGF, CSF, VEGF, cytokines

Specialized signals direct cells to grow and develop into specialized mature tissues

Most prominent in early stages of life; can be reactivated/regenerated when needed

Being studied for collagen stimulation, new vessel formation, and new surface skin cell growth

Botanical Antioxidants

Use 1–2 times a day

Examples: green tea polyphenols, coffeeberry extract, silymarin, soy isoflavones, resveratrol

Plant-derived antioxidants protect against damage to skin caused by free radicals

Some molecules may have anti-inflammatory or anticancer properties

α- and β-Hydroxy Acids

Use once a day or as occasional chemical peels, as directed

Examples: glycolic acid, salicylic acid, lactic acid

Acid preparations made from fruits or milk that provide exfoliation, increased epidermal thickness and dermal

α- and β-Hydroxy Acids *(continued)*

glycosaminoglycans, enhanced penetration of other topical skin care agents, mild antiacne benefits

Note: overuse can lead to skin thinning and enhanced UV damage

Vitamin Antioxidants

Use 1–2 times a day

Examples: vitamin C, vitamin E, vitamin B, iron, zinc

Function to protect against skin-damaging free radicals caused by UV light, pollution, and cigarette smoke

Some vitamin antioxidants have additional properties (eg, vitamin C), such as enhancing collagen formation and reducing pigment production

Retinoids

Use 1–2 times a day

Examples: tretinoin, retinol, retinyl palmitate, retinyl acetate

Specialized forms of vitamin A used by multiple skin cell types

Functions include: antioxidant activity; increased production of collagen, elastin and hyaluronate leading to skin thickening and wrinkle reduction; modulation of cellular differentiation and proliferation restoring normal function to UV-damaged cells (skin cancer protection effect); improving acne, skin tone and texture, pore size, and pigmentation. Retinoids have been called "the great skin normalizers" and have over 40 years of clinical data supporting their skin benefits

Certain forms of retinoids may cause adverse reactions such as: dryness, redness, peeling, and transient acne breakouts

Note: do not use if you are pregnant

Sun Protection

Use sun protection every day regardless of weather; reapply every 4 hours or more frequently during intense sun exposure

Examples: there are many sun protection products available—the key is to use agent that blocks both UVA (the "aging rays") and UVB (the "burning rays")

Remember: 90% to 95% of UV exposure is due to UVA, which can penetrate windows/clouds and is seen at extremes of day; no rating system for UVA yet established—SPF only rates UVB protection. No rating system for sunscreen durability yet established—best protection if reapplied every 2 to 4 hours

In addition to sunscreens, use sun-protective clothing and eyewear

Skin care products from each of the 8 categories in the topical nutritional pyramid complement each other and together make up a well-balanced daily skin care regimen that should be combined with a gentle cleansing program to maintain healthy and beautiful skin. For maximum benefit, patients should begin with a simple regimen of at least sun protection and retinoids, and incorporate more products as needed for a more complex skin "diet."

Abbreviations: β-NGF, β nerve growth factor; EGF, epidermal growth factor; FGF, fibroblast growth factor; CSF, colony stimulating factor; VEGF, vascular endothelial growth factor.

Retinoids—The "great skin normalizers," retinoids are specialized forms of vitamin A that restore function to all types of skin cells that have been damaged by UV light. Because of this, they can protect against skin cancer, treat acne, improve the appearance of wrinkles, decrease oil production, prevent and reduce pigmentation, shrink pores, and strengthen the skin overall. Many different forms of retinoids exist. Prescription forms generally have more adverse events such as skin irritation, redness, peeling, and transient acne breakouts. Newer product formulations designed for certain skin care lines have fewer adverse events, but should still be monitored by a professional. Retinoids should not be used by women who are pregnant.

Patients can keep the topical skin pyramid companion guide as a reference tool to use to make healthy skin care choices, building a skin diet on the foundation of sun protection and expanding to a more complicated skin care regimen from there. The companion guide is used as a dynamic document, which may be updated with new products or information as they become available. The intent is to develop discriminating skin care product evaluation behaviors in consumers by giving them the tools to make healthy choices without succumbing to seductive marketing tactics that pray on wishful thinking.

Skin care products available in physicians' offices can be cherry-picked from multiple skin care lines and selected to provide a few choices within each broad cosmeceutical category (with most emphasis on sunscreens and retinoids) to accommodate different skin types (eg, dry complexion, oily complexion), conditions (eg, acne, rosacea, eczema), or concerns (eg, pigmentation, irritation). The entire office staff may be trained on the concept of the topical nutritional pyramid so that any employee in the clinic can follow the same script when answering questions on topical skin care products. Importantly, cosmeceuticals can be integrated seamlessly with prescription products to design a complete, individually tailored topical skin care program.

CONCLUSION

Using the topical nutritional pyramid concept, physicians can focus on educating patients rather than selling products, and patients receive the information and oversight they need. Providing an informative framework for a general audience of consumers and medical professionals alike may encourage an atmosphere of discerning selection habits for topical skin care products and encourage cosmeceutical companies to focus on providing quality clinically-supported medical data to substantiate the claims of their skin-rejuvenating products.

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