



skin | a balancing act

WHILE THERE HAS BEEN A PROLIFERATION of hormone-based products on the topical skin care market, there is the problem of a huge misunderstanding of what topical hormones can actually do to improve the condition of the skin. It is important to ignore the marketing buzz and hype. Estheticians and consumers need to have a better understanding of the biology and function of hormones as they relate to the skin, so that when they are presented with an over-the-counter topical skin care treatment, they can apply their own logic and make a decision from a stance of knowledge—and not just because it “sounds good.” We all know how adept marketing professionals are at making things “sound good.”

Basic biology

Our endocrine system helps regulate our hormones. Hormones in turn help regulate the function of organs and the lymphatic system. With a better understanding of these relationships and how they affect the skin, we can then begin to understand how, as estheticians, we can help manage our clients' skin care regimen.

The endocrine system is a complex network of integrated hormone-producing glands and organs. It functions in much the same way as the nervous system, acting as the communication between the body and the brain. These specialized glands are what control our hormone production, otherwise referred to as our body chemistry, which in turn controls the function of the organs.

The endocrine system is credited with controlling growth, mental development,

metabolism and tissue function, to name a few of the more obvious things. The endocrine system works by producing and releasing different types of hormones to maintain and control a number of important functions throughout the body, including the lymphatic system, which works in close cooperation with other body systems to help the immune system destroy pathogens, and filtering waste so that the lymph can be safely returned to the circulatory system; removing excess fluid, waste, debris, dead blood cells, pathogens, cancer cells and toxins from these cells and the tissue spaces between them; and also working with the circulatory system to deliver nutrients, oxygen, and hormones from the blood to the cells that make up the tissues of the body.

An imbalance of our hormonal function in the body (either too much or too little hormone volume) can have a ranging effect on the body's overall function, from the most subtle of deviations or fluctuations in function to dramatic malfunctions, or even a shutdown of certain organs or their systems in the body. Being the largest organ, the skin is not only affected by the hormones, but also by any malfunctioning organs triggered by hormonal imbalances.

Skin's function

Our skin serves several functions. It is our body's protective barrier, maintaining and controlling the body's fluid levels and temperature. It assists with the evacuation of toxins and the photo-production of nutrients. Whereas the eyes may be the window to the soul, the skin is the window to our overall

body health. Everything good and bad is reflected by our skin and its condition. That is why the first step to great skin is improving our general lifestyle choices: eating healthier, drinking the right amount of fluids and eliminating any of the bad habits that we indulge in at the expense of our health. It is then that we can try to repair or intervene with topical applications.

Moment for logic

It is here that we need to apply some logic. Just because a hormone regulates or affects certain functionalities in the body does not mean that it will work in the same manner in a topical application. The key functioning ingredients for any formulation is dependent on its entire balance, as well as the type of suspension used. Some need to be presented in an occlusive formulation and others are better served with a water-soluble, non-occlusive formula to allow for better penetration.

There are several theories when it comes to topical treatments. Penetration is the ability for the product to enter the skin via tissue, pores, sweat glands and hair shaft. Stimulation is the ability of a product to stimulate natural production. Occlusion is the ability of a product to set up a protective barrier. Evaporation is the ability of a product to stay and interact with the skin, as opposed to evaporating from its surface. Decoy is the ability of a product to mimic the tissue's own structures and therefore stimulate the body's production of a balancing or complimentary hormone. Bio-availability is defined as the ability,

rate and extent by which an ingredient or drug reaches the intended treatment area or intensity, and is applicable to oral and topical applications.

Typical topical hormones

There are literally hundreds of hormones in our bodies. However, this article focuses on those that directly affect the skin or have achieved widespread popularity in the topical skin care industry.

Steroids like cortisol and aldosterone are produced by the adrenal cortex, and although they have no direct impact on the skin, when produced in the body they do affect the systems and organs that can have a dramatic effect on the skin and its appearance. They have been used in topical applications because of their ability to mobilize amino acids, increase blood volume and act as a strong anti-inflammatory. It is now understood that steroid topical applications do enter the bloodstream, and that their negative impact on the body in general outweighs any benefit to the topical application. Therefore they are strongly controlled by the Food and Drug Administration, no longer available over the counter and can only be dispensed with a doctor's prescription.

There are several peptides that have a direct effect on body tissue and the skin; the challenge is the fragility of the structures make them difficult to harvest therefore most that are used in topical applications are synthetic reproductions. On the other hand, hormones are much sturdier in structure and can be harvested for effective topical application. Progesterone assists the skin's healing process by regulating collagen. Growth hormone stimulates growth and cell reproduction. Lipotropin stimulates melanocytes to produce melanin. Melanocyte stimulating hormone (MSH) triggers melanogenesis through melanocytes in skin and hair. Estradiol helps regulate the maintenance of blood vessels and skin.

There are several topical hormones that have become popular in the skin care industry. Organizing it in categories allows us to have a better understand-

ing of the therapist's role in managing the skin concerns of those who have hormonal variations.

"Acne" is the term used for inflamed skin that presents plugged pores (blackheads and whiteheads), pimples and even deeper lumps (cysts or nodules), which occur on the face, neck, chest, back, shoulders and even the upper arms. It affects most teenagers and adults in their 20s and beyond. Adult female acne can be triggered by changes in hormones, ovarian cysts or pregnancy. Treatment includes oral contraceptives, either alone or in conjunction with other therapies, oral medications or topical creams, gels or lotions with vitamin A derivatives, benzoyl peroxide or antibiotics to help unblock the pores and reduce the amount of bacteria.

Hirsutism is characterized by excessive hair growth on the female face and body; 1 in 20 American women are affected. It might be caused by genetics or abnormally high levels of the male hormone androgen in the blood. Treatment includes oral anti-androgens or topical creams to slow the hair growth, particularly on the face. Polycystic ovary syndrome can also trigger the condition.

Melasma is also known as the mask of pregnancy. It is caused by an overproduction of melanin, a natural substance in the body that gives color to the hair, skin and eyes, leading to dark patches on the face. It is recommended to wear a broad-spectrum sunscreen with a sun protection factor (SPF) of 20 or higher to prevent further darkening of the skin. Treatment can include topical prescriptions or over-the-counter products containing hydroquinone, or prescription products containing retinoids, azelaic acid or hydroxy acids.

Menopause presents several characteristic changes to the texture, turgor and suppleness of the skin. In general, there is thinning of the skin, loss of elasticity and increased sensitivity due to lower levels of estrogen. Treatment options include prescription retinoids or over-the-counter products such as

retinol, alpha-hydroxy acids, antioxidants or peptides.

Androgenetic alopecia is hair loss in which hair thins on the top of the head and becomes finer in texture. This is primarily a genetic condition. Treatment options include topical minoxidil and other therapies, including oral medications that can block the effect of androgens, such as hormone replacement therapy and spironolactone.

Ingredients that seem to help

Several studies have established that topical estrogens produce significant skin improvements in women during or after menopause—essentially, in women whose estrogen levels are low. While systemic effects of small amounts of topical estrogens appear to be rather small, some concerns remain. Oral estrogen replacement has been shown to increase the risk of breast cancer in some studies. There are understandable concerns that possible systemic effects of topical estrogens, however small, might contribute to breast cancer risk.

Progesterone has a role similar to estrogens in skin health and could be used topically to prevent or partially reverse menopausal skin deterioration. A 16-week study published in *The British Journal of Dermatology* in September 2005 involved 40 women and evaluated the effects of 2-percent progesterone cream on the function and texture of the skin in women during or after menopause. The study design was robust: double-blind, placebo-controlled and randomized. On average, the women studied experienced a 23 percent increase in skin firmness, a 29 percent reduction in wrinkle count near the eye and an almost 10 percent reduction in the depth of laugh lines. The study's conductor, Dr. Gregor Holzer and his colleagues reported that no serious side effects were observed.

Copper peptide is the resulting compound, consisting of a peptide and a copper atom. Certain kinds of peptides
continues

have an avid affinity for copper, to which they bind very tightly, therefore stabilizing them in topical applications. Peptides are small fragments of proteins; which are the key building blocks of most living tissues. Loren Pickart, Ph.D., discovered the benefits of copper peptides for tissue regeneration in the 1970s. He found and patented the number of specific copper peptides (in particular, GHK copper peptides or GHK-Cu) that were particularly effective in healing wounds and skin lesions, as well as some gastrointestinal conditions. One of the end results of this research was lamin gel, which is FDA-approved for the treatment of acute and chronic wounds and ulcers. Many substances can have a positive effect on wound healing. A distinctive feature of GHK copper peptides is that they reduce scar tissue formation while stimulating normal skin remodeling. In other words, they help improve restoration of the damaged area to its original look.

Matrixyl 3000 is a combination of the two peptides: palmitoyl oligopeptide (a.k.a. GHK peptide) and palmitoyl tetrapeptide-7. Palmitoyl oligopeptide is a fragment of a type I collagen molecule, and it is believed to serve as a biological indicator of increased degradation of the skin matrix. When the key skin matrix-producing cells (fibroblasts) detect increased levels of GHK, they "assume" that the skin matrix is being lost at a higher rate and begin synthesizing it more vigorously. Thus, Pal-GHK (a version of GHK designed for better skin penetration) is intended to stimulate skin matrix replenishment via topical application, leading, presumably, to wrinkle reduction, skin firming and other benefits. Palmitoyl tetrapeptide-7 consists of a short chain of four amino acids (i.e., GQPR peptide or glycine-glutamine-proline-arginine) connected to palmitic acid. Palmitic acid is a fatty acid added to improve the peptide's oil solubility and thus skin penetration. It is believed to work by reducing the production of interleukin-6 (IL-6) by the key skin cells, keratinocytes and fibroblasts. IL-6 is a molecule that promotes inflammation, which, in turn, leads to

faster degradation of the skin matrix. Thus, it contributes to the development of wrinkles and the loss of skin firmness and elasticity. By reducing the levels of IL-6 and possibly other inflammation mediators, palmitoyl tetrapeptide-7 is thought to slow down the degradation of the skin matrix and may also stimulate its replenishment.

Treatments to consider

Other forms of therapy to consider include interventional treatments like exfoliation, resurfacing, injectables and lasers. Although these cannot be used in prevention, they can be quick and dramatic in curtailing the effects of hormone fluctuations.

Exfoliation/resurfacing is the utilization of mechanical scrubs, acid peels, chemical peels or even laser resurfacing. The theory here is that when you help shed the outer dead layer of the skin, you trigger the production of collagen, because this attack on the protective layer sends a signal to the deeper layers of the skin to become more active. This too has produced smoother and firmer skin.

One of the softer, noninvasive treatments is microdermabrasion, a mechanical exfoliation or micro-resurfacing. It is a cosmetic technique that uses a mechanical medium for exfoliation, along with adjustable suction to remove the outermost layer of dead skin cells from the epidermis. It is a noninvasive procedure, performed in-office by a trained skin care professional. The theory is that the skin's surface is disrupted, cell division occurs, and this stimulates fibroblast activity leading to collagen production. Human skin sloughs off at a slower rate with age, so proponents of the technique claim the exfoliation of several layers of the stratum corneum can lead to generally more youthful appearing skin.

It has also been accepted that certain injectables can also help build collagen. It seems that there is an injectable on the market today that has a credible claim to build collagen. It is an altered form of lactic acid, which our muscles naturally produce. When it is

injected, it triggers the signal to the collagen-producing cells to make more.

There is an extensive amount of research that showcases the ability of lasers to help the dermis build collagen. The different forms are long-wave lasers, which are known to build collagen; and photo-rejuvenation with intense pulse light devices and IPLs, which also send signals to the skin to make more collagen. Then there are light resurfacing lasers such as the light erbium lasers and fractional resurfacing. Both seem to have a dramatic effect in some patients, while in others, not much.

The art of treatment

The treatment of the skin has developed into a holistic scientific art. Today we have a much better understanding of the chemical and hormonal balance of the body and how it affects the skin. Research is still aggressively looking for the lightning rod that will help the body achieve a more controlled hormonal balance, especially in the aging process. It is by having a better understanding and awareness of the endocrine system and its impact on the health and aging process of the body that we can look into treating and eventually eliminating illnesses that are triggered by a decline in chemistry. The great news there is that the skin care industry will directly benefit from this medical research. ■

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