Using Aldara, Copper Peptide, and Niacinamide for Skin Care

The author states that Aldara can be effective in treating actinic keratosis, Bowen’s disease, and basal cell carcinomas; copper peptide has been shown to be useful in wound healing; and topical niacinamide may be beneficial in treating acne. The full therapeutic potential of these agents in a skin care and rejuvenation regimen remains to be explored. (Aesthetic Surg J 2004;24:83-84)

Aldara (3M, St. Paul, MN), copper peptide, and niacinamide are distinctly different agents that each have the ability to improve skin health and appearance. Used in conjunction or serially, they can be valuable tools in a skin care and rejuvenation regimen.

**Aldara**

Aldara, known chemically as imiquimod, is a member of a group of compounds that are immune-response modifiers. The United States Food and Drug Administration (FDA) has approved it for the treatment of genital warts, a virus-induced condition for which it was initially tested. The mechanism of action is antiviral, antitumor, and immunoregulatory; cytokine induction in the skin triggers an immune response to the virus in the surrounding area.

Manufactured in a 5% cream base and applied topically, Aldara can be effective in treating actinic keratosis, Bowen’s disease and, possibly, basal cell carcinomas. In 1 study, 32 applications over a 9-week period produced a florid skin reaction and histologically reversed Bowen’s disease but failed to clear a basal cell carcinoma from the same area.

Clinical relevance to skin care is obvious: Many candidates for therapeutic skin improvement need actinic or Bowen’s lesions cleared to pave the way for a long-term antiaging medication regimen. Other regimens such as Efudex (ICN Pharmaceuticals, Costa Mesa, CA), trichloracetic acid peels, and laser therapy may achieve the same result, but Aldara is another useful tool for preparing severely actinic damaged skin for long-term skin care. The full therapeutic potential has not been studied; Aldara may also be effective in the treatment of keloids and hemangiomas, as well as tattoo removal.

**Copper Peptides**

The use of copper peptides in skin care differs greatly from the use of Aldara but is similar to the use of vitamin C, α-lipoic acid, and green-tea extracts. Copper, iron, and zinc are essential to the growth, development, and function of the human body. Although dietary intake of about 2 mg/day of copper is essential in human beings, the standard American diet only provides an average of 1 mg/day.

Copper is bound in the serum as ceruloplasmin and carried on a protein, like many other elements and compounds essential to metabolism. Copper functions as part of cytochrome c oxidase and superoxide dismutase, which are used in energy production and as antioxidants. Another enzyme that contains copper is lysyl oxidase, which helps crosslink collagen and elastin. The amino acids that bind copper are glycyl, histadyl, and lysine; this information was used to build a copper-based peptide for tissue healing and anti-aging treatment in skin.

ProCyte (Redmond, WA) patented this technology for clinical applications and first used it in wound-healing studies. Copper peptide used for wounds has positive effects on collagen deposition, improves tensile strength, and increases angiogenesis in healing tissues. It also increases superoxide dismutase activity. Copper peptide also demonstrates a positive influence on the growth and regulation of hair follicles. It can also improve healing after chemical peels and laser and dermabrasion procedures, ameliorating skin inflammation by increasing skin nutrient density. The unanswered question: Can it improve skin wrinkles and laxity in “normal” aging skin?

The effects of vitamin C, copper-binding cream, and melatonin cream on skin, as judged from immunohisto-
logical assessment of skin biopsy specimens from 20 normal patients at baseline and 1 month after topical treatment, were compared with that of Retin-A. An increase in dermal papillary fibroblasts was noted in 4 of 10 volunteers treated with Retin-A, 5 of 10 treated with vitamin C, 5 of 10 treated with melatonin, and 7 of 10 treated with the copper-binding cream. The findings of cellular studies suggest that Retin-A and vitamin C have certain antiinflammatory effects on the epidermis. Posttreatment results, however, showed that copper peptide cream was superior to the other treatments. In another study, the copper solution in combination with Cell Tak (BD Biosciences, San Jose, CA), a protein tissue adhesive, significantly improved wound healing in a linear-incision model, manifested by increased tensile strength and neovascularization.

I have had positive experiences using copper peptide products on my patients for more than 2 years. The initial test of a product is whether it is user friendly and pleasant, has a high rate of acceptance, and provides satisfaction. Although my colleagues and I have not performed controlled studies, we find a high percentage of “repeats,” patients who continue to use copper products because they like them and consider them effective. In general, treatment indications are similar to those for topical vitamin C and α-lipoic acid but not the same as those for Retin-A. Because many people are nutritionally copper-depleted, it may be best to start treating aging skin with copper peptide simply to correct this deficiency. Later, other agents combined with good UV protection may be indicated. Copper peptide may also be used in conjunction with Retin-A, although it should be applied at a different time of day to avoid mixing and dilution of the effectiveness of either product. In summary, the science supporting wound healing with copper peptide is sound but the science supporting amelioration of skin aging is still weak, lacking good double-blind comparison studies. However, the products are popular with patients because of their ease of use and efficacy.

**Niacin**

Niacin, also known as vitamin B₃, is one of the 32 known essential vitamins and minerals; it is used by the body for proper circulation and healthy skin. Other uses include promotion of normal nervous system function and metabolism of fat and proteins. At a meeting of the American Academy of Dermatology in 2000, Dr. Zoe Draelos discussed the increased use of vitamins in skin care products, noting that topical 4% niacinamide has been shown to be beneficial in treating papular and pustular acne, as well as breakouts. Although niacinamide and other nutrients seem to ameliorate skin aging, no rigorous comparison or double-blind studies have been performed. The mechanisms of action are not clear, but niacin appears to bolster the nutritional status of skin cells and also exfoliates the skin. This product shows promise for amelioration of skin aging, with no significant complications but mild flushing or itching. Most of the products available for doctors’ clinics contain polyvitamins, with niacin, or vitamin B₃, as only 1 of the components. It is said that vitamins B₃ and B₅ are essential to skin growth and repair. In general, vitamin B₃ appears to do no harm in any of the subjects tested but does carry the possibility of improving overall health as an additional topically absorbed nutrient for the epidermal and superficial dermal layers.

**References**


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