

# Anti-Aging Cosmeceutics for Facial Skin Care in Aging

## Yüz Bakımında Kullanılan Yaşlanma Karşıtı Kozmesötikler

Özgen ÖZER<sup>a</sup>

<sup>a</sup>Farmasötik Teknoloji AD,  
Kozmetoloji BD,  
Ege Üniversitesi Eczacılık Fakültesi,  
İZMİR

Yazışma Adresi/Correspondence:  
Özgen ÖZER  
Ege Üniversitesi, Eczacılık Fakültesi,  
Farmasötik Teknoloji AD,  
Kozmetoloji BD,  
35100, Bornova, İZMİR  
ozgen.ozer@ege.edu.tr

**ABSTRACT** Aging is a complex process that appears in the course of time. Cutaneous aging can be classified as intrinsic aging and extrinsic aging (photoaging). Microscopically physiologic, histologic and metabolic changes can be observed during skin aging. Macroscopically most noticeable changes in the appearance of the skin with aging are, fine and deep wrinkles, dryness and loss of normal elasticity. Prevention of skin aging and reducing the changes in the appearance of skin with aging are the important objectives for cosmetic science. The use of cosmeceuticals which are topically applied and contain ingredients that influence the skin's biological function has significantly risen in recent years. The cosmeceutical products used for facial skin care have to be aimed to achieve antiaging effects by using different bioactive ingredients and their efficiency and safety must be proven scientifically.

**Key Words:** Skin aging, photoaging , cosmeceutics, active substance, efficien

**ÖZET** Yaşlanma ilerleyen zamanla ortaya çıkan karmaşık bir olaydır. Deri yaşlanması intrinsek yaşlanma ve ekstrinsek yaşlanma (fotoyaşlanma) olmak üzere sınıflandırılabilir. Mikroskopik düzeyde fizyolojik, histolojik ve metabolik değişikliklerle, makroskopik düzeyde is kırışıklık, kuruluk, elastisite kaybı ve leke oluşumu ile ortaya çıkar. Cilt yaşlanmasının geciktirilmesi, yaşlanma belirtilerinin kozmetik ürünlerle hafifletilmesi kozmetik biliminin en önemli uğraşlarından biridir. Topikal olarak uygulanan, derinin biyolojik fonksiyonlarını etkileyen bileşenler içeren kozmesötiklerin kullanımı son yıllarda önemli bir şekilde artış göstermiştir. Yüz bakımında kullanılan antiaging kozmesötik ürünler, farklı biyolojik aktif bileşenler kullanarak yaşlanma karşıtı etkiler göstermesi hedeflenen, etkinliği ve güvenilirliği bilimsel olarak kanıtlanmış ürünler olmalıdır.

**Anahtar Kelimeler:** Cilt yaşlanması, fotoyaşlanma, kozmesötik, aktif madde, etkinlik

**Türkiye Klinikleri J Med Sci 2009;29(Suppl):S40-S43**

Aging of the skin is a complex phenomenon in which genetic and environmental factors have a role. Cutaneous aging can be classified as intrinsic aging and extrinsic aging (photoaging). Microscopically physiologic, histologic and metabolic changes can be observed during skin aging. Macroscopically most noticeable changes in the appearance of the skin with aging are, fine and deep wrinkles, dryness and loss of normal elasticity. An aging face shows changes in thickness, barrier function, supporting structure, in colour, roughness in skin surface, sagging with wrinkling.

Cosmetics may be used to delay aging and abate the evidences of aging. The cosmetic product which is effective against aging should fulfill one or some of the

effects of moisturizing, catching free radicals, accelerating cell division and filtering UV rays.<sup>1-4</sup>

Aging of the skin is a complex phenomenon that occurs as a result of many factors. To prevent aging, it is essential to protect the skin from damage. Precautions should be taken against environmental factors. Sun protection products should be used regularly. Loss of moisture in the stratum corneum layer should be prevented and the moisture of the skin should be restored. The increase in the moisture of stratum corneum provides a smoother and more even appearance. Moisturizers protect the skin against external effects by forming a thin layer of film on the skin.

Cosmetics are used to abate the evidences of aging. For this purpose short-, middle- and long-term solutions may be recommended.<sup>5</sup>

Short-term solutions: Superficial structure and pigmentation defects are eliminated by using decorative cosmetics. The appearance of wrinkles may be abated by peeling the skin. Middle-term solutions: Middle-term solutions are obtained by increasing the moisture content of the skin and using active cosmetics providing stratum corneum plasticization.

Long-term solutions: Long-term solutions are obtained by means of sun protection cosmeceuticals containing free radical catchers. For sun protection, UV filters and as free radical catchers, substances such as vitamin E are used.

Skin care products is the most discussed part of today's cosmetic industry and the most rapidly developing part of natural personal care industry. Cosmeceutical active substances have been developed as a result of the combination of cosmetic products and pharmaceutical, biotechnological or natural products. The increasing interest in and knowledge on the fields of skin biology and pharmacology also accelerated the development of new cosmetic products and active ingredients. Protection and care of the skin, the largest organ of our body is factor necessary for being healthy. External factors such as air pollution, solar radiation, etc. cause damage and premature aging in the DNA, collagen and cell membranes of the skin. Skin care products do not normally have a protective or therapeutic effect for the skin against such type of damage. The products containing active ingredients have the ability to act on the biological functions of the skin according to the components they contain.<sup>6</sup>

It is not possible to have a definite opinion about the behaviors of the active substance in the vehicle. The

vehicle may also provide benefit individually. For example, o/w, w/w, gel type preparations containing petrolatum or mineral oil exhibit occlusive softening effect. Preparations with low oil content and an aqueous lotion structure provide benefit for short-term inflammation.

The vehicles of moisturizing quality that do not contain any active ingredients were observed to be effective in the treatment of dry skin. By choosing the suitable vehicle, it is possible to minimize the come side effects, in particular irritating effect, resulting from the active substance. Controlled release systems may also be used for the same purpose.

As a matter of fact, the pharmaceutical industry benefits from the cosmetic industry for vehicles it uses for the topical administration of the drug that are reliable, easy to apply on the surface of the skin and that gained the satisfaction of the customers. Even the developments in the emulsion technology itself are remarkable. For example, increased biological efficiency is obtained in the skin by using formulations sizing a few hundred nanometers with PIT emulsions prepared by phase modulation technology. At present, many cosmetic formulations are based on emulsions. Emulsions are one of the oldest and useful systems in cosmetic field.

Oils are one-phase systems made up of lipid-soluble raw materials. Their skin protecting characteristics are two-fold: they supply lipids to the skin and build a protective occlusive layer over skin. Gels are semi-solid transparent systems whose gelatinous state is based on the three dimensional lattice- structure of the base material; Oleogels (water free), hydrogels (oil-free), and oil/water gels.<sup>7</sup>

New products containing slightly low oil, moisturizes the skin better, without clogging the pores and that products prepared with agents that simulates the natural moisturizing factor keeps the skin in the desired moisture and softness for longer periods.

#### Composition of NMF

Aminoacids	40%
Pyrrolidone carboxylic acid (PCA)	12%
Lactate	12%
Urea	7%
Na, Ca, K, Mg, phosphate, chloride	18.5%
NH <sub>3</sub> , uric acid, glucosamine, creatinine	1,5

## REST UNIDENTIFIED

Application of an appropriate skin care regularly is the best way to keep the skin in healthy and good condition and minimizing the evidences of aging. As a result of aging, the moisture content and elasticity of the skin decreases and wrinkles are formed. Today, there are a wide range of skin care products on the cosmetic market. These products may be classified by the type and formulation of the product. It is important to know the skin's type to apply the proper skin care; however, there the three steps in skin care, regardless of the skin's type: cleansing, toning and moisturizing the skin.<sup>8</sup>

## CLEANSERS, TONERS, MOISTURIZERS

Products cleansing the skin are used to purify the skin of make-up residues, dead cells, sebum, sweat residues and dirt accumulated on the skin. Commonly, creams, lotions and gels are used for this purpose depending on the skin type and personal usage habits.

Using the protease enzyme in cleaning products dates back to many years ago. Facial cleaners containing protease enzyme removes protein residues and dead epidermal keratinocytes from the skin surface. Since it is difficult to preserve the stability skin care preparations such as cream and lotion, they are added to the products that stay on the skin's surface for short periods in powder form.

Products toning the skin are products complementing the cleaning process by cleaning the residues on the skin and revitalizing the skin. These are generally aqueous alcoholic solutions. The alcohol percentage may vary depending on the desired astringent effect and the skin type. The alcohol content may be as high as 60%; however, in this case, softening agents such as ethoxylated lanolin derivatives are added to the formulation to decrease the drying effect of alcohol. In recent years, alcoholic-free products have become popular. Toning products may also contain moisturizing or ester-like agents as well as fruit acids, vitamins, salicylic acid, allantoin and flavonoids. Hammamelis extract obtained from Hamamelis plant and known as "Witch Hazel" is also used as a toning agent.

Moisturizers, are used to keep the moisture of the skin in balance and protect it against external effects. Cosmetically, the most important reason of dryness of the skin is decrease in water content and epidermal lipids. Another reason is the removal of the hydrophilic

and hygroscopic substances from the skin's surface. Therefore, water retainers (humectants), softening agents (emollients) and skin-covering substances (occlusives) are used in the products intended for moisturizing the skin. Moisturizing or softening products are manufactured in low-viscosity emulsion (transparent or opaque lotion), high-viscosity emulsion (cream), solution (transparent lotion) or gel form.

## SKIN WHITENING FORMULATIONS

Skin decolorants should be prepared in vehicles such as cream and lotion, without lessening their efficiency or causing any change of color. Since it is necessary to use for a few months for the effects to appear, these products may be used for a few months - a few years. In case no effect is observed for six months following the application of skin decolorizing preparations, the application should be discontinued. Such preparations may be used for maximum two years.

## SUN PRODUCTS

Preparations acting by dispersing and absorbing sun rays and providing suntan by dyeing the skin may be formulated in different ways. Preparations prepared in cream form should create a film that is easily spread on the skin. The film should not seem too oily and shiny, should not be easily removed by sea water and should be of softening quality.

## SHAVING PREPARATIONS

The basic function of the products used for wet shaving is to soften the beard and allow the razor to slip on the skin easily. The formulation of these products should be of a thickness to create a thin layer on the skin's surface and not to prevent the shaving treatment. The quantity of the wetting substances and the softening oils added to enhance slipperiness and the pH of the formulation are important factors for the efficiency of the product.

## SERUMS AND FACIAL OILS

Skin care serums have gained in popularity and effectiveness. They are used to give the skin a boost and have hydrating, anti-ageing or brightening properties. Serums are able to hold a higher level active ingredients due to their simple, fat-free consistency. Some brands promote the use of serums together with facial oils. The serum is designed to enable the essential oils in the facial oil to be delivered deeper into the skin.

## REFERENCES

1. Önder M, Öztaş M. Kozmetoloji ve Deri. In: Yazan Y, ed. Kozmetik Bilimi. Nobel Matbaacılık. 2004; p 13-20.
2. Jenkins G. Molecular Mechanisms of Skin Ageing. Mechanisms of Ageing and Development 2002; 123:801-10.
3. Yılmaz B, Eskioğlu F. Yaşlanma ile Birlikte Deride Gözlenen Makroskopik ve Histopatolojik Değişiklikler. T Klin J Cosmetol 1998; 1: 4-9
4. Hadshiew, I M, Eller M S, Gilcrest, B A. Skin Aging and Photoaging: The Role of DNA Damage and Repair. Am J Contact Dermatitis, 2000; 11(1): 19-25.
5. Hekimoğlu S. Yaşlanmaya Karşı Kullanılan Kozmetikler. In: Hekimoğlu S, Hıncal A, eds. Kozmetoloji Günleri 1: Deri Yaşlanması ve Kozmetiklere Bir Bakış. Ankara: Şafak Matbaacılık; 1997. p 29-40.
6. Dureja H, Kaushik D, Gupta M, Kumar V, Lather V. Cosmeceuticals: An emerging concept. Indian J Pharmacol 2005; 37: 155-9.
7. Draelos ZD. New developments in cosmetics and skin care products. Adv dermatol 1997; 12:3-17.
8. Tırnaksız F., Cilt bakım ürünleri In: Yazan Y, ed. Kozmetik Bilimi. Nobel Matbaacılık. 2004; p 91-123.