Skin Rejuvenation

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Introduction

To become old without looking old has been a dream almost as old as mankind. Skin in old age –whether the result of decades of life or artificially aged by excessive sun exposure, smoking, and other noxious influences – looks wrinkly, lax, shallow, without sheen, and with blotches and wrinkles, telangiectasia, and pigmentary irregularities.[1]

Skin aging is a continuous time-dependent and multifactorial phenomenon of reduction in size and number of cells and reduction in the rate of many organic functions, both at the cellular and molecular levels. Many skin functions decline with age, such as cell replacement, injury response, barrier function, chemical clearance, sensory perception, immune and vascular responsiveness, thermoregulation, sweat production, sebum production, and vitamin D production.[2-5] That is why it is worth to keep researching cosmetic products and procedures for the elderly because as said by Irene Ravache, a famous Brazilian actress, "only those who die early don't age," and by Mario Quintana, one of the most well-known Brazilian poets, "aging is wonderful because the other option is worse ..."[5]

Besides, multiple other factors affect the way skin ages: heredity, sun exposure, chronologic age, emotional stress, repeated weight gain and loss, diet/nutritional supplements, and exercise.[6-8] Rejuvenation is a recent concept in cosmetology that encompasses the entire gamut of therapy available to preserve and return a youthful appearance to the skin. It has been dominated by the manipulation of the dermal layers to correct the effects of aging.

The rejuvenation programme consists of the use of following modalities alone or in combination.

Protection from extrinsic factors

- Daily skin care: Cleansing and moisturizing.
- Habits: Adequate sleep and fluid intake, reduce/avoid smoking and alcohol.
- Adequate therapy and antioxidants.
- Cosmetic camouflage: an effective means of concealing ageing skin problems.
- Cosmeceuticals: Alpha hydroxy acids, tretinoins, hydroquinones and vitamin c.
- Non-surgical therapy: Massage, face packs and masks, iontophoresis, microcurrent therapy.
- Surgical therapy: Chemical peeling, radio surgery, dermabrasion, microdermabrasion, lasers, dermal fillers, botox, and face lifts.

Pharmaceutical products and procedures for the elderly

Non Surgical methods

Sunscreens and sunblocks

The sunscreen agent is thought to prevent cellular damage and thus prevent dehydration. It may bechemical, physical, or a combination of both. It can cause an apparent reversal of some photoaging and keep the skin youthful looking by formation of neocollagen and new elastic fibres.[6-11]

Moisturizers and keratolytic agents

The continuous loss of water content of the stratum corneum through evaporation on the surface to the environment leads to xerosis. The cells accumulate, giving the skin a white and scaling aspect. However, xerotic skin is due to more than simply low water content, and electron micrographic studies demonstrate a thicker, fissured, and disorganized horny layer. This characteristic tends to increase with age due to a decrease in the inherent water content of the stratum corneum, and probably an abnormal desquamatory process is also present. Moisturizers decelerate the loss of humidity from the surface of skin by deposition of an oil film, avoiding evaporation; help minimize the aspect of fine wrinkles; and maintain appropriate level of skin humidity.[12-13] There are many moisturizing agents, such as hydrocarbon oils, silicone oils, vegetable and animal fats, fatty acids, fatty alcohol, polyhydric alcohols, phospholipids, and sterols, among others. Keratolytic agents act in the xerosis of the elderly by preventing accumulation of excessive stratum corneum and removing the cohesive attachment of the cornified cells. The oldest keratolytic agent is salicylic acid, a betahydroxy acid. Others are propylene glycol, retinoic and glycolic acids, propylenoglicol in water, and lactic acid, which also act as moisturizers.[12,14,15]

Topical application of retinoids and analogs are used for aging skin and the ones currently available are retinol, retinaldehyde, retinoic acid, isotretinoin, adapalene, and tazarotene.[16-23]

Antioxidants

Ultraviolet A light acts indirectly through generation of ROS, as well as UVB light, which also generate ROS by induction of DNA damage. The induction of MMP also plays a role in the pathogenesis of photoaging. UV light induces a wide variety of an ever increasing family of MMPs.[28] If the generation of ROS is an important proximal step in the UV signaling, which mediates photoaging, then the appropriate use of antioxidants may be an effective prevention strategy. Although countless commercial products containing one or more of alleged antioxidant exist, no data have proven that any of them really affects the UV response. Antioxidants include vitamins A (retinol), C (ascorbic acid), and E (tocopherols); B-carotene; and bioflavonoid. Antioxidants act as oxygen scavengers, and seem to affect primarily the number of sunburn cells, the apoptotic keratinocytes, which appear after UV radiation.[24] Topical applications of á-tocopherol or ascorbic acid decrease UVB-induced erythema and edema and decrease the number of sunburn cells. Carotenoid preparations and synthetic phenolic antioxidants similarly are reported to reduce UV-induced erythema and retard development of squamous cell carcinomas in the hairless mouse model. Intervention modalities that would enhance cellular DNA damage repair would be of utmost importance for maintaining health in the elderly.[24,25]

Caloric restriction

Caloric restrictions have a beneficial effect on some cutaneous functions, but do not seem to affect all functions.[26] It is possible that decreasing energy metabolism by restricting calories would reduce the rate of ROS generation and increase lifespan. Caloric restriction or undernutrition without malnutrition is well documented to affect longevity.

Estrogens

Skin aging process increases rapidly in postmenopausal women after the age of .[50] The external symptoms of skin aging observed in this period are connected with a decrease in collagen content, which is conditioned by the same mechanisms that regulate its contents in bone tissue.[27-30] Estrogens influence the amount of collagen synthesized by fibroblasts, increase the synthesis of hyaluronic acid, and promote water retention. Skin fibroblasts have receptors for both androgens and estrogens. Most estrogen receptors are found on facial skin. They also increase synthesis of the extracellular matrix and inhibit sebum secretion, so their regular use should prevent dry skin and skin wrinkling.[31] Hormone replacement therapy contains two main ingredients: estrogens and progestagens. Hormone therapy was shown to significantly improve parameters involved in skin aging such as hydration, elasticity, and skin thickness. These findings support the clinical impression that an early hormone substitution therapy may restore the initial features of hormonally induced skin aging.[32] The evaluation of skin condition of postmenopausal women after topical treatment with creams containing estrogens (estriol and estradiol) showed a significant reduction of wrinkles as well as increased elasticity and better vasculature of the skin.[33]

Makeup

The skin, as a most important presentation of a person to its counterparts, is essentially the visual calendar by which the years are measured.[45-47] Cosmetics of the skin, hair, and nails represent an area of great importance for the practicing dermatologist. Cosmetics aspects of aging skin are of intense interest in most societies and the products now available can actually improve the appearance of the skin. Lipliners, lipsticks, mascara, nailpolishes, shampoos, hair additions are widely used for improving the clinical appearance and camouflaging of diseases.

Surgical Methods

Chemical peels

Destruction of epidermis and, in some cases, superficial dermis does produce edema and, hence, appreciable improvement in appearance. There is documented evidence that some of these substances and procedures can induce formation of new collagen with normal staining properties.[15,34,35] Trichloroacetic acid 10–35% is used to accomplish superficial chemical peelings on facial and nonfacial areas and may be repeated every 7 to 28 days. Jessner's solution is a combination of resorcinol, salicylic acid, and lactic acid in ethanol. Its application can be light or intense and may be repeated after 3–4 min. Jessner's solution amplifies the effect of 5-fluorouracil and this association is called the fluorhydroxy pulse peel. Salicylic acid is a á-hydroxy acid and can be used as a 50% ointment on the dorsa of hands and forearms or as a 35% solution in ethanol for the face. Erythema and edema are minimal and the peel can be repeated every 2– 4 weeks. Peels of glycolic acid are excellent facial rejuvenating therapies. Although the irritant power of glycolic acid is often directly related to its low pH, irritancy of the vehicle must also be considered.[36-39] Other á-hydroxy acids include lactic, malic, citric, and tartaric acids; the most commonly used in dermatology are glycolic and lactic acids. A new era in dermatologic

treatment began with the introduction of retinoids two decades ago. Topically and in higher concentrations than the ones used for the keratolytic effect, some retinoids may be used as peelings agents with very good results.[16-23]

Toxin botulinum

Toxin botulinum, just to mention, is a sterile, vacuumdried purified form of botulinum toxin type A indicated for the treatment of strabismus, blepharospasm, and other related condition. It acts by inhibition of acetylcholine release of the motor endplates. It temporarily denervates specific muscles responsible for certain facial rhytids including the glabelar furrow, horizontal forehead lines, horizontal neck lines, and crow's feet.[40]

Fillers

Every substance used for soft tissue augmentation presents features that make it, case by case, the best choice, or not indicated for a certain patient.[41] A variety and countless filling substances are in the market and some of the defects susceptible to improvement by cutaneous filling presented by the aging patient are cutaneous aging, as furrows and wrinkles, expression wrinkles, depressed scars, profile defects of the face, lip atrophy, and skin roughness. Substances successfully employed in soft tissue augmentation are bovine collagen, autologous fat, silicone, hyaluronic acid, Goretex®, Fibrel®, and SoftForm®, among others, and all need skilled physicians to apply them. Large wrinkles can improve with injection of bovine collagen, silicone, hyaluronic acid, or fat extracted from the abdomen or thigh of the patient. Each method is highly effective when used for its correct indications and by skilled physicians.[42]

Plastic surgery

There are many surgical procedures for different areas and objectives. Plastic surgery techniques, including blepharoplasty and rhitidectomy, and dermabrasion, have been a part of the medical scenario and conceivably will remain. Full face cryopeeling can eliminate precancerous lesions and also improve texture, wrinkles, and pigmentary problems associated with photoaging.[43] Dermabrasion or surgical skin planning is used to improve the skin's contour as new collagen and epidermis replace the abraded skin. The new skin generally has a smoother appearance. It is indicated in selected patients for fine wrinkles, scar correction, melasma, and perioral wrinkles.[44] The aging changes of the skin are not a direct threat to the physical well-being of the patient, but their psychological impact, particularly in regard to self perception, self-esteem, and quality of life, can be significant and even profound .[45,46] As the population of elderly people increases, patients' dissatisfaction with their aging skin changes will attract more and more the attention of physicians and merit a response for their caring. Thus careful examination of the patient, evaluation of the patient's wishes, and expectations govern the methods adequate for each individual case.

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