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Review Article

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FACTORS RELATING TO SKIN AGING

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Our aim is to introduce new updates on skin health so that the skin can maintain health and thus youthfulness for as long as it possibly can.

The only visible damage due to aging is associated with major healing defects, and is linked partly to the alteration of the biomechanical properties of skin cells, mainly involving dermal fibroblasts.[1]

The immune system, another key component in maintaining skin homeostasis and the efficient healing of wounds, also suffers from the effects of time: the consequent skin immunosenescence which concerns a gradual deterioration of the immune system, limits anti-infectious and vaccine responses, while promoting a pro-tumor environment.[4] Senescent cells have been found to accumulate with age and may contribute to age-related skin changes and pathologies.

These changes occur under the influence of intrinsic as well as extrinsic factors, with sun exposure being the most deleterious to the skin. Skin changes associated with aging are the focus of many surgical and nonsurgical procedures aimed to improve the appearance.

Knowledge of skin histology and physiology will deepen the understanding of cutaneous changes associated with aging and will promote optimal cosmetic and functional patient outcomes.[3]

The skin is factually a sentinel organ making easily visible the passing of time. Chronological and environmental aging weakens skin structure and functions. The skin barrier, the elastic and mechanical properties of the cutaneous tissue as well as its vascular reactivity are impacted by aging.

Barrier dysfunction in aged skin is caused by renewal and differentiation defects in epidermal keratinocytes, notably linked to abnormal expression of micro-RNAs that regulate cell death and autophagy. An abnormal balance between synthesis and degradation of matrix proteins modifies the mechanical properties of the dermis in aged skin. Additionally, reduction of vascular reactivity linked to endothelial dysfunctions is observed in elderly people.

These biological processes can be targeted by therapeutic approaches either topical or systemic, especially using anti-oxidants or senolytics. These anti-aging strategies might contribute to restore, at least in part, the functional integrity of aged skin.[5] The vascular supply gradually becomes weak as well.

There are two main processes that induce skin aging: intrinsic and extrinsic.[7] A process that implies random cell damage as a result of mutations during metabolic processes due to the production of free radicals is also implicated. In statistics this phenomenon is known as a stochastic process. Dysfunctions are observed in elderly people. These biological processes can be targeted by therapeutic approaches either topical or systemic, especially using anti-oxidants or senolytics.

Natural polyphenols exert many health benefits, including ameliorative effects on skin aging by affecting molecular pathways of senescence.[2]

Given the paucity of data regarding aging in ethnic skin, the authors have consolidated available information for these populations: Caucasian, African American, East Asian, and Hispanic skin, each have distinguishing features of aging, but with population differences.

Patients with skin of color may present with distinct concerns, including changes in pigmentation and variable changes in facial structure dependent on ancestry. Given

their increased melanin content, these individuals are generally less prone to signs of photoaging. skin type, exposures, and genetics that all skin types will at some point exhibit.[8]

Aging is an inevitable process that manifests differently depending on a patient's skin type, exposures, and genetics. All skin types will at some point exhibit photodamage, bone remodeling, and soft tissue redistribution.

Perhaps the most recognizable consequences of tissue aging are manifested in the skin. Hair graying and loss, significant wrinkles, and age spots are all symptoms of physiological aging, Many of the aging processes are analogous to those that also occur in other tissues as well, albeit with less visible outcomes. While the study of skin aging has been conducted for decades, more recent work has illuminated many of the more fundamental molecular and physiological causes of aging in the skin.

Recent technological advances have permitted the detection and quantification of a variety of physiological triggers that lead to aging in the skin, and molecular methods have commenced to determine the etiology of these phenotypic features.

This review attempts to summarize recent work in this area and provide some assumptions about the next trends of studies.[9]

The skin represents the first bearer of marks of time as well as an easily accessible model for the assessment and determination of the involved molecular mechanisms. Deterioration of important skin functions resulting from intrinsic and extrinsic aging leads to subsequent clinical manifestations, which mirror several internal age-associated diseases, such as neurodegenerative, cardiovascular, skeletal, and endocrine-metabolic skin diseases. Current molecular data indicate that skin aging, especially intrinsic aging, corresponds to age-related deficiencies in the entire human body.

These data and the development of new biologic technologies highlight the importance of research in skin in aging, and should enable future interdisciplinary projects on internal diseases, which could barely have been performed until recently mainly due to the lack of respective tissue.[10]

Skin is the largest and most complex organ in the human body and comprised of multiple layers with different types of cells. Diverse kinds of environmental stressors, for example, ultraviolet radiation (UVR), temperature, air pollutants, smoking, and diet, accelerate skin aging by stimulating inflammatory molecules.[6]

Skin senescence caused by UVR accounts for approximately 90% of skin aging and is characterized by loss of elasticity, fine lines, wrinkles, reduced epidermal and dermal components, increased epidermal permeability, delayed wound healing. These external factors can cause aging through reactive oxygen species (ROS)-mediated inflammation.

Furthermore, aged skin is a source of circulatory inflammatory molecules which accelerate skin aging and cause aging-related diseases.

This review article focuses on the inflammatory pathways associated with ultraviolet radiation-mediated skin aging.

Personal experience and observations

The chief author uses magnesium sulphate cream on the facial skin twice daily to keep the skin rejuvenated. She also uses magnesium sulfate spray on the skin of the cervical, thoracic and lumbosacral regions for skin as well as muscle rejuvenation effects.

Magnesium sulfate can easily penetrate through the skin to also reach underlying muscles and thus keep both skin and muscle relaxed and healthy.

A woman's face: youthful skin (left picture side), aging skin with wrinkles (right picture side) (non copyrighted internet picture)

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