30.1B: Effects of Aging on the Integumentary System

The integumentary system undergoes intrinsic and extrinsic cutaneous aging, primarily involving the dermis.

Learning Objectives

• Contrast intrinsic aging with extrinsic aging of the integumentary system

Key Points

• Intrinsic aging is caused by internal factors alone, such as diminished collagen synthesis, and is sometimes known as chronological aging.
• Extrinsic aging is caused by external factors, such as exposure to ultraviolet radiation, which can result in photodamage and may lead to skin cancer formation.
• A validated comprehensive grading scale categorizes the clinical findings of skin aging as laxity, rhytids (wrinkles), and the various facets of photoaging, including erythema/telangiectasia, dyspigmentation, solar elastosis, keratoses, and poor texture.

Key Terms

• **extrinsic aging**: Aging caused by external factors such as exposure to radiation or toxic substances.
• **intrinsic aging**: Aging caused by internal factors related to degeneration of physiologic processes.

Intrinsic and extrinsic aging are terms used to describe cutaneous aging of the skin and other parts of the integumentary system. Aging primarily involves the dermis and has limited effects on the epidermis.
Intrinsic Aging

**Wrinkled Skin**: Wrinkles form due to intrinsic (loss of collagen) and extrinsic (photodamage) aging.

The effects of intrinsic aging are caused solely by internal factors. Sometimes called chronological aging, intrinsic aging is an inherent degenerative process due to declining physiologic functions and capacities. This may include qualitative and quantitative changes such as diminished or defective synthesis of collagen and elastin in the dermis. As skin ages, it becomes thinner and more easily damaged. Intensifying this effect is the decreasing ability of skin to heal itself with age. Skin aging is also noted by a decrease in volume and elasticity and the increased incidence of wrinkles. Aging skin receives less blood flow and lower glandular activity. Cortisol (associated with stress) causes degradation of collagen, accelerating the aging process.

Extrinsic Aging

**Skin Cancer**: Image of a basal cell carcinoma caused by extrinsic aging.

Extrinsic aging of skin is caused by external factors such as ultraviolet radiation, cigarette smoking, and air pollution. Of all extrinsic causes, radiation from sunlight has the most widespread documentation of negative effects on the skin. Because of this, extrinsic aging is often referred to as photoaging, defined as skin changes caused by chronic exposure to UV light. Photodamage implies changes beyond those associated with aging alone. It is defined as cutaneous...
damage caused by chronic exposure to solar radiation and is associated with emergence of neoplastic (cancer) lesions. Photoaging causes two main concerns: an increased risk for skin cancer, and the appearance of damaged skin. In younger skin, sun damage will heal faster since the cells in the epidermis have a faster turnover rate, while in older adults, thinner skin and slower healing may result in damage to the dermal layer.

A validated comprehensive grading scale has categorized the clinical findings of skin aging as laxity (sagging), rhytids (wrinkles), and the various facets of photoaging, including erythema/telangiectasia (redness), dyspigmentation (brown discoloration), solar elastosis (yellowing), keratoses (abnormal growths), and poor texture.

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