

**IMPACT OF ENVIRONMENT FOR PREMATURE SKIN AGING AND SOME OTHER TRIGGER FACTORS****Dr. Kirti Sharma^{*1}, Dr. S. R. Inchulkar² and Dr. Prafulla³**¹P.G. Scholar First Year, Department of Agad Tantra Evam Vidhi Vaidyak, Govt. Ayurvedic College, Raipur (C.G.).²Professor and HOD, Department of Agad Tantra Evam Vidhi Vaidyak, Govt. Ayurvedic College Raipur (C.G.).³Reader, Department of Agad Tantra Evam Vidhi Vaidyak, Govt. Ayurvedic College, Raipur (C.G.).***Corresponding Author: Dr. Kirti Sharma**

P.G. Scholar First Year, Department of Agad Tantra Evam Vidhi Vaidyak, Govt Ayurvedic College, Raipur (C.G.).

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ABSTRACT

Aging is natural process but premature aging is different, premature skin aging occurs when mainly our skin undergoes to unnatural aging process. Our skin is the largest and most visible organ which is heavily influenced by environmental factors. Causes for premature skin aging are several which may be:- environmental factors like chronic exposure of sun, life style choices such as poor diet and nutrition, alcohol consumption, smoking etc. Medical conditions like stress, depression, lack of sleeping etc. These conditions bring skin aging before the time. Premature skin aging is induced by environmental factors which is called extrinsic aging process. Unhappiness, lack of exercises, not resting enough, facial mimicry, low diet of fruits and vegetables are the trigger factors for premature skin aging. Premature skin aging is considered by loss of glowing complexion of skin, wrinkles of the skin, visible fine lines under eyes and forehead. Thus this review article helpful to summarize the impact of environmental factors and other trigger factors, which manifest the premature skin aging.

KEYWORDS: Premature skin aging, Photo aging, Environmental factors, Chronic sun exposure, Trigger factors etc.

INTRODUCTION

Aging can be defined as a progressive accumulation through life of random molecular defects that build up with tissue and cells.^[1] Aging is self-accelerating process, which takes place on the molecular, cellular, and tissue level respectively.^[2] There are two different types of aging, one is chronological or intrinsic aging and extrinsic aging. Extrinsic skin aging is caused by environmental factors such as chronic sun exposure.^[3] Intrinsic structural changes occur as a natural consequence of ageing and are genetically determined.^[4] Aging is the natural process but the premature skin aging is different. Premature aging of skin occurs mainly when our skin undergoes to unnatural aging process. Skin is the largest and most visible organ of the body which is heavily influenced by environmental factors. Causes for premature aging are several a) environmental factors such as- chronic exposure of sun, UV radiation, environmental pollution etc; b) Life style choices- poor diet, alcohol, smoking, c) Medical conditions such as stress, depression, lack of sleeping. These conditions bring skin aging before the time. Premature skin ageing is more prominent on sun exposed body areas and predominantly on facial regions, where environmental and lifestyle factors are associated in morphological changes including wrinkles, dryness, rough texture and pigmentation.^[5] These changes are directly related with

photo-ageing. There are many trigger factors which manifest the premature skin aging such as unhappiness, lack of exercise, lack of sleep, facial mimicry, poor nutrition etc.

AIMS AND OBJECTIVE

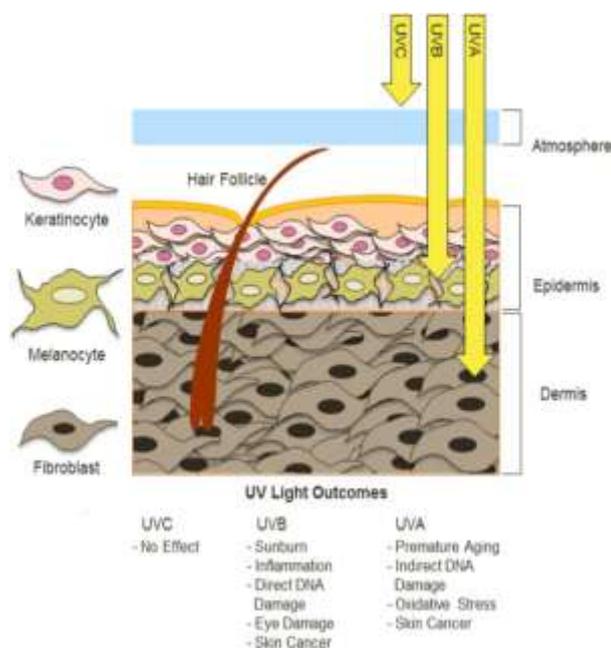
1. To explain the causative factors (environmental causes) for premature aging.
2. To explain some trigger factors which accelerate the aging before time.

Premature Skin Aging and Chronic Sun Exposure

The main external factor which is responsible for premature aging is the chronic exposure of sunlight. Excessive sun exposure damages the skin and leading finally to premature skin aging which is also called photo aging. The sun causes 90% of skin damage, which often worsens with age. The body desires sunlight to produce vitamin D for strong bones and teeth, but when UV rays meet unprotected skin, they can cause sunburn, wrinkles, hyperpigmentation, age spots and skin cancer also.^[6] Photoaging induces in the sun-exposed areas and is characterized clinically by fine and coarse wrinkling, roughness, dryness, sagging skin, and pigmentary changes.^[7] Skin becomes with diminishing sweat and sebaceous glands.^[8]

Premature Skin Aging and Uv Radiation

Solar spectrum is composed of these infrared light (56%, wavelength 700-1400nm), visible light (39%, 400-780nm) and 5% ultraviolet (UV) light (200-400nm). UV radiation is divided into UVC (200-290nm), UVB (290-320nm) and UVA (320-400nm).^[9] UVB rays reach only the surface of the skin which leads the bronze tan, and also the sunburn. The impact of UVA rays is invisible and slow, but more damaging to the skin. Due to the greater wavelength, they penetrate deep into the dermis and may reduce collagen and elastic properties of the skin to alter the three-dimensional structure of elastic fibers destroying collagen and elastin, proceeding to cell changes.^[10,11] UV exposure can induce wrinkling over time. Similarly, also other wavelengths within the solar spectrum like IRA have been shown to contribute to premature skin aging(photo aging).^[12] UV rays has various harmful effects on cells, it can be generate both direct and indirect DNA damage.^[13] It damaged the DNA in keratinocytes and melanocytes, and stimulate production of the soluble epidermal factor (ESF) and proteolytic enzymes, which can be found in the dermis after UV exposure^[14], which can also be found in the epidermis.^[13] UV exposure also damage cellular macromolecules indirectly, through production of oxidative free radicals(ROS).^[15]



Smoking

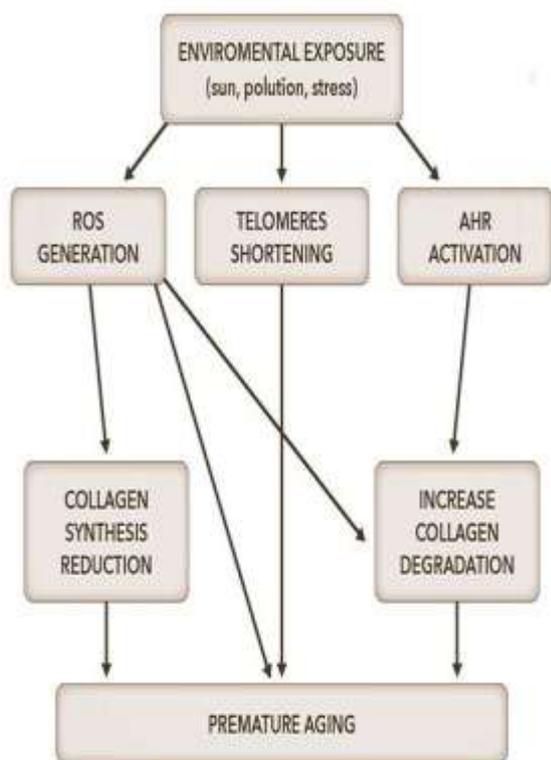
Another environmental factor smoking is an important role for contribution in premature skin aging. Smoking causes vasoconstrictions of blood vessels, which leads to less oxygen to the skin as well as oxidative damage to the skin. Smoking also leads to wrinkles by destruction of collagen, elastic fibres, and proteoglycans, which are the building blocks needed for thick youthful skin.^[16] Smoking is also associated with many dermatological conditions, including poor wound healing, premature skin aging, squamous cell carcinoma, melanoma, oral

cancer, acne, psoriasis, and hair loss¹⁷. Smoking accelerates the skin aging process by reduces the elasticity of the skin which causes grayish tan. Nicotine and chemical contained in cigarettes are responsible for the increasing amount of free radicals in the skin.^[10] The decreased moisture in the stratum corneum of the skin raises to facial wrinkling due to direct toxicity of the smoke.^[18] Tropoelastin and matrix metalloproteinases (MMP), which degrade matrix proteins, and causes production of abnormal elastosis material also. Smoking enhances MMP levels, which leads to the degradation of collagen, elastic fibers.^[17]

Mechanism

The production of reactive oxygen species (ROS) or free radicals, through environmental factors exposure to sunlight along with unhealthy lifestyles, like tobacco smoking, alcohol consumption, and poor nutrition, is contribute to the process of aging in the skin. ROS induces gene expression pathways result in increased degradation of collagen and accumulation of elastin. ROS not only directly destruct interstitial collagen, but also inactivates tissue inhibitors of matrix metalloproteases (MMP) and induces the synthesis and activation of matrix degrading metalloproteases.^[19,20] Mitochondrial DNA incurs regular DNA damage due to repeated constitutional oxidative stress, and in particular deletion of a specific length of DNA called common deletion that is 10 times more common in photo-damaged than in sun-protected skin. The deletion results in further accumulation of ROS, with additional damage to the cell's ability to generate energy. The extent of mtDNA damage in photo-damaged skin does not correlate with the chronologic age however, but rather with photodamage severity.^[21] UV radiation can also accelerate shortening of telomere, and results in the activation of DNA damage response proteins such as p53, a tumor suppressor protein. The latter can induce proliferative senescence or apoptosis, depending on the cell type.^[22]





ENVIRONMENTAL FACTORS

Skin sensitivities can outcome from environmental assaults, such as pollutants and toxins, which present in air and water. These environmental assaults are associated with oxidative stress and the intracellular generation of reactive oxygen species (ROS), which damage DNA, lipids, proteins and mitochondrial function.^[19] Especially in big cities, pollution is much more which can trigger the production of skin-damaging free radicals. In addition, pollution worsens the harmful effects of the sun, enhancing oxidative stress levels. Pollution is problematic for skin. Air pollutants can affect the ability of skin to retain moisture levels; the skin may therefore become dry and scaly and going to slowly towards aging. Dust can also clog pores and increase bacteria on the face resulting in acne. Pollution can actually cause reactions in skin that disturbs its self-regulatory system. Cold air slows down blood circulation. As a result, the skin's metabolism slows down and the cells get less oxygen. This condition cause premature aging. Also, going from one extreme temperature to another (for instance: from cold outdoors to a heated house), aggravates skin problem.^[23]

SOME OTHER TRIGGER FACTORS

There are some **other triggering factors** which are accelerate to the premature aging-

1 Stress and unhappiness- Stress gives to be muscles tenser and prevents blood from bringing oxygen and nutrients to the skin. Tension can also slow the removal of waste from underlying tissue. Excess strain slows down the cell turnover rate so new cells take longer to reach the skin. Stress affects the skin's barrier function which reduces its ability to absorb and retain

moisture. Consequently, a lot of their moisture is lost, making the skin dull.^[24] Unhappiness coming from stress, when having excessive mental stress affects the physical appearance. Anger and distress can form permanently in the form of fine lines and wrinkles on the face. When the face expresses chronic sad or angry emotions, the constant scowling can turn into wrinkles formed by muscle memory.^[25]

2 Alcohol intake- it lead to all kinds of health problems. Drinking excessively can leave permanent marks on the body due to it deplete the necessary nutrients in our bodies. Heavy drinkers have facial skin that has been discolored over time, has poor muscle tone.^[25]

3 Poor diet- Antioxidants are molecules that have the ability to neutralize free radicals which are responsible for the damage to the skin as well as the acceleration of the aging process. A diet which is rich of antioxidants helps to slow the aging process. However, the diet that includes more antioxidant-rich fruits and vegetables can become a key instrument for the comprehensive approach to prevention of aging.^[10] A healthy diet which is rich in fruits and vegetables provides the intake of antioxidants that help to limit the harmful effects of free radicals on the skin. Of course, there are some foods which should be avoided. It was found that a diet too high in fat and carbohydrates stimulates the aging process. Avoid excessive food intake (excess calories), saturated fats, fried food, excessive alcohol intake, and soft drinks.^[26]

4 Lack of exercise- Tissue wasting can occur as in muscle weakness with lack of exercise. Regular workouts can help prevent premature aging and keep body in shape.^[25]

5 Lack of sleep- generally need to 7-8 hour amount of sleep. Sleep is also responsible for dissolving free radicals notorious for their contribution to early aging. Sleep not only does prevent the body from rejuvenating and repairing the skin. Therefore lack of sleep is also triggering to premature skin aging.^[27]

6 Facial mimicry - It is also accelerate the skin aging process.^[28] Due to facial mimicry lines becomes prominent on face, continuous mimicry can leave permanent fine lines.

DISCUSSION

Skin is subject intrinsic and extrinsic aging processes and it is an boundary organ which is particularly susceptible to environmental insults (e.g., UVR). The sun is not only etiological factor in process of skin ageing, but it is the primary exogenous cause among several internal and also environmental elements. Thus focus of this article, the causative factors of photo-ageing, and other trigger factors which is the accelerate the premature aging of skin. The aging process of skin affected mainly by environmental causes like chronic sun exposure, UV radiation, pollution, smoking etc; which bring premature

skin aging. More than half of us look older than we are due to above mentioned causative factors. Premature skin aging is characterized by wrinkles of the skin, visible fine lines under eyes and forehead, loss of glowing complexion. Premature skin aging can be preventable by protecting the skin against sun exposure, quitting smoking and alcohol, choosing healthy diet, exercise, meditation and less stress.

CONCLUSION

Skin is the barrier between the body and the outer environment. Environmental factors leading to extrinsic skin aging process or premature skin aging. We can understand the environmental impact on premature skin aging by the mechanism. The aging process as related to the skin involves thinning of the skin, loss of firmness and elasticity, decrease in collagen, increased fragility. Skin required collagen, elastin, hydration and oxygen to look younger and healthy. In this article we have seen so many causative factors which responsible for premature skin aging such as environmental factors and some other trigger factors.

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