

Quantifying Skin Aging – A Review of Different Scoring Systems And Affirmations For Beautiful Skin.

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Abstract- The primary target of aging in body is skin, amongst other organs, hence the aging sequence need special attention. Chronologic age and solar damage are the most important intrinsic and extrinsic factors associated with skin aging. Skin aging characteristics vary ethnically among races. In this study we tried to summarize various quantification parameters used in different scales of aging across different races. Scoring and assesement of aging can provide us with the knowledge about the amount of damage done so far, as to devise treatment protocols that can increase the quality of elderly life and to prevent age related diseases.

Keywords-aging, intrinsic aging, extrinsic aging, aging parameters, scoring system

Date of Submission: 14-07-2020

Date of Acceptance: 29-07-2020

I. Introduction

Aging is the gradual decline in organ functional reserves with reduction in ability to maintain homeostasis under stress. Aging begins from the day we are born.

It is an individualized process which proceeds at different rates in different people. Aged skin is more likely to wrinkle or sag, collagen is reduced in amount and it becomes thinner, drier and less elastic.¹

Facial Aging begins with surface and subsurface structural changes in multiple facial tissue layers, including skin, fat, muscle and bone. Facial tissue layers age interdependently, contributing to overall facial appearance. Changes in one tissue layer have an effect on the other layers.²

A youthful look depends on having the right amount of facial fat in right places. Redistribution, accumulation, and atrophy of fat lead to facial volume loss. Some areas lose fat (forehead and cheeks) and other areas gain fat (mouth and jaw). Modification of the fat pads leads to contour deficiencies.³

There is a significant loss of facial bone with age. Bone resorption and expansion leads to biometric volume loss. Without the structural support of bone, there are noticeable changes in the other layers of overlying soft tissue and skin. Hypertrophy or atrophy of particular muscle groups leads to loss of the feminine or muscular features of the face to that of the opposite sex.⁴

Skin aging is classified under-*Intrinsic Skin Aging And Extrinsic Skin Aging*

Intrinsic Skin Aging-

Chronologic aging-Inevitable natural aging process that occurs in all people Occurs as part of a pre-programmed degeneration within cells and extracellular matrix in all skin layers. Although begin in 20's, visible signs are not apparent for many decades. Intrinsic aging proceeds at highly variable rates between different people Primarily determined by unique genetic make-up and underlying type of skin.⁵

Extrinsic Aging –

Outside factors may also accelerate intrinsic aging. These include- photoaging, smoking, malnutrition, hormonal disorders, chronic disease states, repetitive facial expressions and gravity. Everyone has a strong inner desire to remain young. For that one has to quantify skin aging and then only some kind of therapeutic intervention is possible. Here we present a summary of different methods to quantify skin aging.⁶

II. Materials And Methods-

A thorough research of database available from year 2000- 2020 on – Medline, Pubmed, Embase, and Google scholar was done using keywords- *skin aging assesement, skin aging score, skin aging quantification, and aging scoring system*. The results obtained were summarized.

RESULTS- There were more than 100 skin aging assesement scales compiled from different literatures. But most of them were either related to Caucasians skin or were focussed on specific areas such as face and neck. Some of the scales only used selected signs of aging, while others used multiple skin signs but the content and the measurement was substandard.^{7,8,9} Here we are summarizing different scales which have good reliability, structural resiliency, hypothesis testing and criteria validity.

Mers aesthetic scale (MAS) given by Rzany et al. assesses superficial and deep wrinkles, facial fat tissues and nasolabial folds.¹⁰

Skin aging scores (SAS) given by Guinot et al. additionally assesses ptosis of eyelids, tissue slacking, milia and senile comedones.¹¹

Two unnamed scores given by Bazinet al.¹², and Allehand et al.¹³ use similar criteria.

Most comprehensive scales available are given by Lim et al., Yaar et al. and Score Of Intrinsic And Extrinsic Skin Aging (SCINEXA)¹⁴ use additional criterias such as yellowish discoloration, solar elastosis, pseudoscars, freckles, solar lentigenes, melasma, uneven pigmentation, telangiectasia, actinic keratosis, xerosis, cutis rhomboidisnuchae, Favre Racouchot syndrome and various forms of skin malignancies.

All these scales involve objective assesement of the skin by a dermatologist. So the scales will be subjected to observational error.

Looking into this limitation, mordern technology has entered into detection of skin aging. The Technological advances include- use of 3 Dimensional camera, Dermoscopy,¹⁵ physical sample analysis of skin color and measurement of skin elasticity by instruments such as Reviscometer.¹⁶

III. Discussion And Conclusion

Once assesement of skin aging is completed, interventions can be undertaken to prevent further progression of aging. They may include preventive measures such as photoprotection, maintaining adequate oral hydration,¹⁷ diet high in fruits and vegetables (containing antioxidants), Good daily skin care regimen, avoiding smoking,¹⁸ and use of excessive alcohol.¹⁹

Nutraceuticals are modern day dietary skin care regimen which includes consumption of a balanced diet including polysaccharides such as – Lycium polysaccharides, algal polysaccharides, lingzhi polysaccharides, and mushroom polysaccharides,²⁰ polyunsaturated fatty acids like Omega-3 and omega-6 works which help maintaining skin barrier and have anti-inflammatory effects are richly found in Olive oil, avocado, nuts, fish oils, seeds of *W.somnifera*, flax seeds, hemp oil, canola oil, chia seeds, pumpkin seeds, sunflower seeds, walnuts.²¹

Polyphenolic compounds which are found in the spice box of every indian kitchen are antioxidants of a large group of bioactive compounds which consist of flavonoids, phenolic compounds, sulfur-containing compounds, tannins, alkaloids, phenolic diterpenes, and vitamins.²²

Vitamins A, B, C, D, E and Ubiquinol (coenzyme Q10) are essential for skin homeostasis.²³

The pre and probiotics- contain *Lactobacillus johnsonii* NCC533 is said to modulate cutaneous immune homeostasis altered by UV exposure thereby reducing allergic skin responses.²⁴

These are all the measures that are preventative in nature. But not even the best of us could defy signs of aging. Once those lines start appearing only a dermatologist can work his magic and offer some of these skin rejuvenating charms. A good dermatologist can offer a combination of Alpha and beta Hydroxy Acids peels (AHA and BHA), Retinoids, Botulinum Toxins, Dermal Fillers and Laser & Light treatments for an ever youthful skin.

We conclude by a quote by Dr. Howard Murad “Aging is a fact of life, looking your age is not”.

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