

SKIN AND HAIR CHANGES AFTER FORTYManisha Nijhawan¹, Shifa Yadav², Puneet Aggarwal³, Dinesh Mathur⁴**HOW TO CITE THIS ARTICLE:**

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INTRODUCTION: Aging is a continuous, dynamic, and an irreversible process. Direct exposure to ultra-violet radiations, skin is particularly prone to early aging, known as photo aging. Skin aging is particularly important because of its visibility and social impact. As women age we will notice changes to our skin and hair during the menopause. Dry, thinning, fragile, less tolerant and sagging skin are common complaints. The main reasons for the change in skin is the loss of estrogen, testosterone and dehydroepiandrosterone (DHEA) etc,^{1, 2, 3} from the age of 35 onwards up to menopause, the more we have had long-term exposure to the elements, such as sun and wind the more this becomes evident. Estrogen is very involved in the normal function of the skin. It directly affects the function of key cells in the skin, like the fibroblast (produces collagen and elastin), keratinocyte (closely involved in skin protection) and melanocytes (involved in evenness of skin color, etc.). It also helps regulate hair follicle function (hair production) as well as sebaceous gland activity (producing skin oils). After the age of forty most of women enters menopause, during which estrogens levels decreases, which leads to different types of hair and skin changes which has been described in this article.

PATHOPHYSIOLOGICAL CHANGES AFTER FORTY:

There are three stages in menopause:

1. Perimenopause
2. Climacteric
3. Menopause

Age of onset of menopause:

Usual age 45 to 50yrs average being 47yrs.

Premature menopause - before 40 yrs.

Late menopause – menstruation beyond 52 yrs.

PERIMENOPAUSE:

- A period of 3years before menopause & followed by 1 year of amenorrhoea. Associated with mild ovarian hormonal deficiency, Leads to anovulation, menorrhagia.

MENOPAUSE:

- The time of cessation of ovarian function resulting in permanent amenorrhoea, For confirmation: 12 months

CLIMACTERIC:

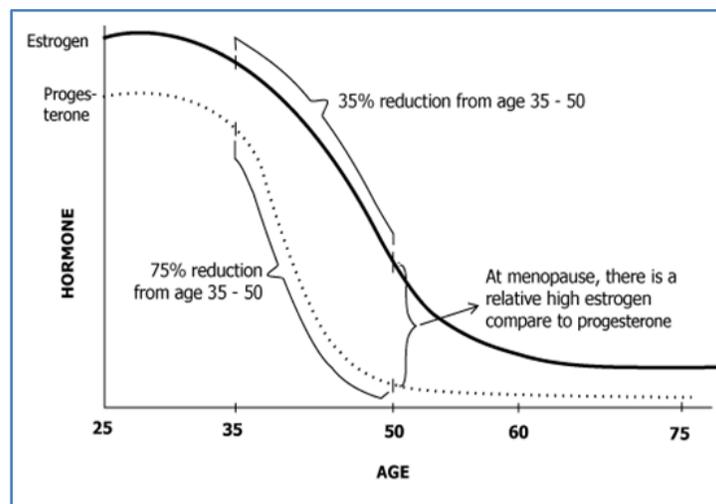
- Phase of waning ovarian activity
- 2-3 yrs. before and 2-5 yrs. after menopause.

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During climacteric, ovarian activity declines.

Initially, ovulation fails, no corpus luteum forms and no progesterone is secreted by the ovary. Later, graffian follicle fails to develop, estrogenic activity decreases and endometrial atrophy leading to amenorrhea.

There is increased secretion of FSH and LH by anterior pituitary. There is 50 times increase in FSH, LH by 3-4 times. Menopausal urine has become an important commercial source of gonadotropins. Later gonadotropin activity of anterior pituitary ceases and fall in FSH level eventually occurs. There is 50% reduction in androgen production and 66% reduction in estrogen production. Some estrogen is produced by ovary (oestrone, E1). FSH appears in large concentrations. Low estrogen levels are responsible for ageing of skin and hair follicle. Levels (below 20pg/ml) predispose to osteoporosis and ischemic heart disease.



There are two main processes which induces skin aging:

1. Intrinsic aging.
2. Extrinsic aging; includes photo aging and environmental aging.

1. Intrinsic aging: As the cells of the skin age, they become less able to carry on their normal functions. The skin thins as production of collagen and elastin lessens. The hair produced by the skin begins to turn gray. Skin releases superficial dead cells less readily, causing dry and dull-appearing skin. This depends on the genetic make- up of the person.

2. Extrinsic aging: U.V radiation is the major cause of extrinsic ageing also called as photo aging.

a. Photo aging:

The areas of the body that are exposed to sunlight typically show much more deterioration over time than areas on the same person that aren't exposed to UV rays both UVA (320-400 nm) and UVB (290-320 nm), the skin response to the radiations is dependent on the genetic predisposition of an individual.^{4,5} Increased wrinkling on the face compared to the inner arm is generally due to the accumulated damage from sunlight.

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b. Environmental aging: As the outer shield for the body, skin comes into contact with a lot of damaging conditions and materials. Smokers develop what is known as “smokers face” characterized by facial wrinkling and ashy grey appearance of skin^{6,7}.

Other agents like Pollutants, Wind, Extreme, temperatures and stress; all of these take their toll as well.

CLASSIFICATION OF AGING:

Glogau’s photoaging classification⁸

Type	Characteristics
No wrinkles	Typical age 20-30 Early photo aging with mild pigmentary changes No keratosis and no minimal wrinkles
Wrinkles in motion	Typical age late 30 to 40 Early to moderate photo aging Early sensitive lentigens Palpable but not visible keratosis Parallel smile lines beginning to appear Lateral to mouth
Wrinkles at rest	Typical age 50 or more Advanced photo aging Telangiectasia, dyschromia, visible dyskeratosis
Only wrinkles	Typical age 60 or older Severe photo aging, yellow gray skin Precancerous lesions with no normal skin

SKIN CHANGES:

- Increased loss of collagen –the support structure in the skin, more open pores, facial vein becomes more prominent.
- Decrease in the glycosaminoglycans (GAG’s) that provide ‘plumpness’ to skin which leads to more volume loss.
- Decrease in dermal thickness.
- Decrease in skin elasticity, sagging appears.
- Dry skin, skin becomes rough needs more hydration in winters.
- Fine wrinkling, discolouration.
- Poor healing, Increased susceptibility to trauma.
- Increase in unwanted facial hair.
- Decrease in scalp hair.
- Decrease in skin strength.
- Increase in laxity, wrinkles, pigmentary changes, xerosis, slackness, cherry angiomas, seborrhic keratosis, telangiectasia, purpura, ecchymosis.

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HAIR CHANGES:

Hirsutism: abnormal hair growth on face. The problem in these women is that the hair is more sensitive than normal to small amounts of hormone. The hair grows more quickly and thicker in response to it. The increased hair growth is usually first noted in late teenage years and tends to gradually get more severe as the woman gets older. The main conditions associated with excessive androgens are polycystic ovaries and less often, congenital adrenal hyperplasia.

Greying, thinning, dryness and brittleness of Hair: Increases with age.

There can be two type of hair loss:

Androgenetic alopecia Female pattern Alopecia: most common, caused by male hormones. Hair loss that occurs due to an underlying susceptibility of hair follicles to androgenic miniaturization. There is hair recession at the temples, vertex, and top of the scalp.

Telogen Shedding: loss of hair over a short period of time due to dramatic hormonal changes.



Fig. 1: Showing hirsutism on face and female androgenic alopecia

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Care and management: Everyone realizes that skin shows increasing signs of ageing as the years pass although this seems to accelerate in our late 40's it happens to both women and to men.

1. **Collagen support:** Look for ingredients that encourage an increase in collagen production and, ideally, the glycosaminoglycans (GAGs) that help fill out the skin. This is done with the help of daily applications of Retin A products.
2. **AHA's:** Acids increase the thickness of the epidermis and decrease the thickness of the dead superficial cells, especially lactic acid which is the main ingredient in the facial washes to improve GAG content and help normalize the tone of the skin.
3. **Sun Protection:** Because the sun's UV rays do substantial damage, you should regularly use sun protection. Don't be afraid of getting a modest amount of sun on your body regularly as it is crucial for helping provide your body with active vitamin D.

Sun screens which can be either:

Chemical (UVA, UVB) or physical type.

Systemic sunscreen like b-carotene and hydroxychloroquine.

Oral Anti-oxidants reduces UV induced skin damage.

Facts about sunscreens:

Most facial foundation contains titanium dioxide.

UPF (UV protection factor) measurement guidelines for clothing. Fabrics with tighter weaves, darker colours, synthetic fibres and loose fit provide greatest protection.

Polyester cloth has a SPF of 2, and cotton has SPF of 15.

About 90% of summer clothes usually cotton have a UPF higher than 10.

Washing clothes appears to strengthen the UPF.

Wearing a broad brimmed hat can provide an SPF of about 5.

Goggles and umbrellas can add to the protection.

Glass windows can be augmented against UVA by using lunar UV shield (blocks 99.9%) of UVA.

Hair care products with sunscreens have no validity.

Wet skin and hydration increase the absorption of UV light.

4. ANTI-OXIDANT PROTECTION:

Much of the deterioration of the skin occurs through oxidation.

The skin normally has antioxidants present to help counter this effect. Providing additional antioxidants through topical application can help further protect the skin. No single antioxidant is a 'miracle'; use products that combine complementary antioxidants for the best effect.

Eg; carotenoids, flavonoids, tocopherol, polyphenols, vitamin c.

Lycopene primary carotenoid.

5. **MOISTURIZATION:** A significant skin function is to keep water in – in the skin and in the body. But, aging skin gradually loses its ability to do so, resulting in dry skin, but also in greater loss of

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water through the skin. Use of a body lotion that mimics and replaces as much as possible the normal skin oils can help. Eg: ceramides, squalene, vitaminA, glycerin, liquid paraffin, Aloe Vera.

6. Cosmeceuticals:

These are cosmetic products that have a medical or drug like benefit.

They contain biological active ingredients.

Combines two words cosmetic plus pharmaceuticals.

Commonly used cosmeceuticals for skin:

Retinoids	Retinol Retinal Retinoic acid
Alpha hydroxy acids	Glycolic acid Lactic acid Tartaric acid Citric acid
Beta hydroxy acids	Salicylic acid Beta lipohydroxy acid Tropic acid
Polyhydroxy acids	Gluconic acid Lactobionic acid galactose
Antioxidants	Vitamin A, E, C, B Lipoic acid Coenzyme q10 Niacinamide Polyphenoles dimethylaminoethanol
Skin lightening agents	Phenolic, nonphenolic combinations

Cuticle damage results in structural changes to hair shaft leading to weathering. Other factors include UV exposure, excessive wetting, repeated harsh chemical procedures, and repeated brushing and combing. Using appropriate shampoos, conditioners according to hair type helps in repairing the damage.

SHAMPOOS AND CONDITIONER:

- **AMPHOPHILIC:** are mildest and have good conditioning effect do not irritate eyes
- Major component of baby shampoo

CONDITIONERS:

- They have negative charge and adhere to positively charged cuticle and coat the hair adding to shine of hair.

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- Protein based conditioners get attached to inner hair shaft at cuticular breaks and help in repairing split ends.
- Hair serum contains dimethicone which coats for hair and acts like a film making the hair tangle free and manageable.

Treatment for skin rejuvenation⁹:

Noninvasive photo rejuvenation method:

- This stimulates collagen synthesis.
- Indicated in fine to moderate wrinkles, periorbital tissue lightening.

Chemical peels:

- Stimulates epidermal exfoliation, epidermal and dermal rejuvenation, decrease pigmentation
- Indicated in fine wrinkles, melasma, freckles,
- lentigines
- Superficial scars

Microdermabrasion:

- Stimulates mild exfoliation, epidermal regeneration and collagen formation
- Indicated in fine and superficial scars

Botulinum toxin:

- Inhibits neuromuscular transmission and weakens the injected muscle
- Indicated in forehead horizontal lines, glabellar, frown lines, crow's feet, marionette lines

Fillers:

- Fill the wrinkles
- Indicated for nasolabial folds, deep forehead lines, deep perioral wrinkles, lip augmentation
- Hyaluronic acid fillers commonly used

Thread lifts:

- Pulls up and tightens the face
- Sagging cheeks, brow lift chin lift

Fractional photothermolysis:

- Stimulates collagen synthesis, fine wrinkles, dyschromia.

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Fig. 2: Botox Injection Site



BEFORE AND AFTER EFFECTS OF BOTOX

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FOODS FOR GLOWING SKIN AND HAIR: Carotenoids which exerts photoprotective effects as Antioxidants which include carotenoids, flavonoids, vitamin c, tocopherols polyphenols.

Lycopene is the primary carotenoid which is found in: Tomatoes, apricots, papaya, pink grapefruit,

FOODS WITH SIGNIFICANT POLYPHENOL LEVELS: ^{10, 11}

Vegetables	Fruits	Miscellaneous
Broccoli, cabbage, eggplant, lettuce, olives, onions, soybeans, spinach	Apples, apricots, berries, cherries, citrus fruits, grapes, peaches, plums	Cocoa, coffee beans, flaxseeds, grains, nuts, red wine, tea

FOODS WHICH IMPROVE DRY SKIN^{12, 13}

- Avocados, canola oil, evening primrose oil, fish (salmon, tuna).
- Flaxseed oil, nuts, olives, olive oil, peanuts, soy, sunflower, walnuts.

Food to consume and avoid to help keep wrinkles at bay: ¹⁴

Eat	Avoid
Asparagus, celery, eggplant, garlic, legumes, leeks/onions, monounsaturated fat, olive oil, spinach	Butter, margarine, milk and milk products, red meat, sugar products

FOOD WITH OMEGA-3 FATTY ACIDS: ^{15, 16}

- Canola oil, fish (tuna, lake trout, salmon), flaxseeds, hempseed, omega -3 eggs, seaweed, walnuts

CONCLUSION: Alterations to one's lifestyle to ensure long term improvements. We cannot change the intrinsic factors but can alter the environmental and photo induced changes. STRESS is one of the most important factors in aging which can only be worked upon by an individual. Things like exercise, yoga are known stress relievers.

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