



Perspective

Skin-lightening practices in India

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ABSTRACT

Skin lightening involves various practices to bleach the skin or to reduce the normal skin tone. The practice of skin-lightening spans several continents throughout the centuries and cultures primarily aimed at improving the quality of life. The main aim of skin lightening in medieval times was to increase the sign of femininity and thereby its benefits. In India, skin lightening is preferred as a mark of class, caste, and richness. Dermatologists are faced with many problems dealing with requests to make skin fairer, while in the west, there is a problem dealing with skin conditions in skin of color. Many skin-lightening agents are sold as over-the-counter products and are popularized or advertised through magazines, social media, and celebrity influences. These products are self-prescribed and used rampantly despite the side effects. There is a strong equation between caste, social class, marital prospects, and occupational status based on skin color. Multinational skin-lightening cosmetic brands have a lucrative market. The most widely used topical agent in skin lightening is hydroquinone, while other non-hydroquinone agents are also frequently used. In general, combining skin-lightening agents have increased efficacy. Systemic agents such as glutathione, tranexamic acid, Vitamin C, and other miscellaneous agents are also popular. Several procedures ranging from chemical peels to lights and lasers are increasingly practiced for more effective skin lightening. In India, all skin-whitening creams can be bought without a prescription as OTC products. These products are not considered pharmaceutical products and are not subject to testing and regulations. In addition, the injudicious use of intravenous glutathione by unqualified personnel poses a threat to the lay public. In our role as dermatologists, we should develop a holistic approach in counseling and treating those patients on a quest for skin lightening.

Keywords: Skin-lightening agents, Skin-whitening treatments, Fairness, Practices in India

INTRODUCTION

Skin lightening also referred to as skin bleaching or skin whitening, involves various practices at lightening the normal skin tone. Comparatively, India's skin-lightening traditions came into existence much later, but the search for fairer skin steadily increased. There is an abundance of colorism in India due to the global prevalence of "pigmentocracy," a term used to describe societies in which wealth and social status are determined by skin color.^[1]

HISTORICAL PERSPECTIVE

Skin-lightening culture dated to 200 BCE was mainly for symbolic, religious, or therapeutic purposes. They commonly used products derived from plants such as labrusca or wild wine and minerals such as lead, mercury, and arsenic. Similarly, in Indian culture, dark color is synonymous with less attractive, underprivileged, and poor status, while fair skin symbolizes beauty, power, and privilege. This situation reflects on the sales of fairness/skin-lightening creams and soaps in India, representing an annual market of 6.75 billion rupees (the US \$150 million),

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60% of skincare product sales. There have been continuous legal battles fighting against obsession and advertisements promoting fairness but all in vain. Ancient practices in skin lightening/modern skin-lightening practices are attempted from womb to tomb in Indian culture. Indian mothers are encouraged to drink milk with saffron for a “fair-toned baby.”^[2] Children are bathed with a mixture of lentils (“Nalungu mavu” in vernacular), turmeric powder, milk, and almonds ground in a paste. Oil massages are also a part of bathing practices to produce skin lightening. Students entering high school or college are lured into skin lightening practices in the form of bleaching facial hair either at home or in the salon. There is a lot of misuse of steroids by the salons and quacks. Men, as well as elderly individuals, also follow this practice. Bleaching agents used here are hydrogen peroxide, ammonia, hypochlorite, and other chemicals or herbs in various concentrations, leading to a lightening of the skin. Salon-based procedures are used in facial massages or face packs using one of the above products, and these procedures are carried out at specific intervals along with routine home care whitening agents. Girls who enter marriageable age are often attracted to these procedures as a fair-complexioned girl is the most preferred in the society.

SKIN-LIGHTENING AGENTS IN THE INDIAN MARKET

At present, there are many fairness creams, face and body washes, lotions, and soaps for men and women. One of the prototype products is “Fair and Lovely” marketed since 1975 a popular whitening product containing niacinamide and is relatively safe. Some other products sold contain dangerous products such as mercury, steroids, and hydroquinone. Despite the side effects of the above agents, they continue to dominate the Indian markets. Some of the common side effects encountered by patients who acquire over-the-counter products for skin lightening are irritation, redness of the skin, excessive darkening on sun exposure, acneiform eruptions, and hypertrichosis due to steroid misuse and permanent hyperpigmentation.

SKIN-LIGHTENING PRACTICES AMONG DERMATOLOGISTS IN INDIA

Dermatologists in India are often confronted with requests for skin-lightening products and procedures. Sometimes, newborns, born to parents of the skin of color, are brought to dermatologists’ offices requesting recommendations for soaps, lotions, and creams for cosmetic skin lightening. Many a time, the consultation results in counseling to avoid the search for fairness products. Nevertheless, dermatologists are pressurized to suggest products for fairness under certain circumstances based on medical and sociocultural aspects of skin lightening.

MODERN ERA DERMATOLOGISTS AND SKIN-LIGHTENING PRACTICES

Various options are available to a dermatologist to choose skin lightening as a treatment based on the individual’s request and need.

Common options available are as follows:

1. Topical
2. Systemic
3. Procedural.

Topical

A host of topical skin-lightening agents with different mechanisms of action [Table 1] is available to a dermatologist in the form of creams, lotions, sunscreen, masques, and soaps.^[3] The gold standard in skin brightening is photoprotection along with molecules that inhibit or decrease melanin synthesis. Invariably, there is an induction or treatment phase when a maintenance phase aggressively follows the treatment to sustain the achieved results. Hydroquinone is the gold standard in skin lightening. Hydroquinone inhibits tyrosinase, the rate-limiting enzyme, and is well studied for its efficacy and side effects.^[4] However, hydroquinone alternatives or botanicals are preferred for safety reasons. Other commonly used agents are azelaic acid, kojic acid, arbutin, oxyresveratrol, mulberry extract, soy proteins, polyphenols, Vitamin C, cysteamine, and tranexamic acid. Many new topical agents are available in other parts of the world, and some are in the pipeline. A classic combination of skin-lightening agents used for therapy is Kligman’s formula which has stood the test of time. Combination therapy has a synergistic effect and increases the efficacy compared to monotherapy.^[5] Skin-lightening agents used in combination are multiple with or without hydroquinone, steroids, and retinoids [Table 2].

Systemic skin-whitening agents

Systemic skin-whitening agents are slow in gaining popularity as there is less scientific evidence in the medical literature.

Common systemic skin-lightening agents.^[6]

1. Glutathione
2. Tranexamic acid
3. Vitamin C
4. Miscellaneous agents such as pine bark extract, astaxanthin, hyaluronic acid, and epidermal growth factor.

Most systemic agents are used orally, while glutathione and Vitamin C are injected intravenously with great precautions.

Pitfalls with systemic agents

These agents lack proper clinical studies and scientific backup. Results are not predictable and reproducible. In

Table 1: Mechanism of action of frequently used skin-lightening agents.

Skin-lightening agent	Mechanism of action
Kojic acid, mequinol, azelaic acid, arbutin, aloesin, flavonoids, mulberry extract, resveratrol, and N-acetyl glucosamine	Tyrosinase inhibition
Vitamin E, Vitamin C, coffee berry extract, and polyphenols.	Antioxidants
Alpha-hydroxy acids	Acceleration of epidermal turnover and desquamation
Niacinamide and soy proteins	Inhibition of melanosomal transfer
Retinoids	Downregulation of tyrosinase and epidermal melanin dispersion. Interferes with pigment transfer and accelerates pigment loss.
Corticosteroids	Anti-inflammatory and non-selective inhibition of melanogenesis
Licorice	Melanin dispersion and tyrosinase inhibition
4-N-butylresorcinol	Tyrosinase inhibition, antioxidant, and anti-inflammatory
Undecylenoyl phenylalanine	An antagonist of an α melanocyte-stimulating hormone, β -adrenergic, and stem cell receptors

addition, there is a lot of misuse with injectables by non-medical personnel and, therefore, associated with many side effects such as sepsis, anaphylaxis, and Stevens-Johnson syndrome.

Procedures in dermatology as skin-lightening practice

In general, multiple procedures ranging from chemical peels to lights and lasers for skin lightening are practiced [Table 3]. Procedures for skin lightening are carried out in localized areas such as the face, neck, torso, and limbs. These procedures are also more commonly used for skin conditions with hyperpigmentation such as melasma, suntan, or post-inflammatory hyperpigmentation following acne.

Commonly used procedures are as follows:

Microdermabrasion

It is a minimally invasive epidermal resurfacing procedure used to treat uneven skin tone.^[7] It is an easy, simple, and effective treatment for the exfoliation of epidermal melanin.^[8]

Table 2: Combinations of skin-lightening agents.

Common indications	Agents used in combination
Suntan	I. Tranexamic acid – 10%, pTeroWhite – 0.12%, L-Glutathione – 0.5%, Vitamin C – 0.5%, and Vitamin E – 0.02%. II. Glycolic acid, arbutin, kojic acid, lactic acid, mulberry extract, and licorice III. Retinol, alpha arbutin, sodium ascorbate, niacinamide, ferulic acid, beta hydroxyl acids, tocopherol, and retinyl palmitate IV. Oxyresveratrol, liquorice, niacinamide, and Vitamin E
Post-inflammatory hyperpigmentation Melasma	Retinol, azelaic acid, kojic acid, tranexamic acid, and resorcinol I. Hydroquinone – 4%, mometasone – 0.1%, and tretinoin – 0.025% II. Arbutin, kojic acid, mulberry extract, tranexamic acid 10%, and Vitamin E
Periorbital hyperpigmentation	Green tea extract, arbutin, Vitamin E, Vitamin K, ascorbyl palmitate, retinol, and ferulic acid

Chemical peels

Usually, alpha-hydroxy acids, trichloroacetic acid, and combination peels with phenol, kojic acid, and Vitamin C are used. Multiple sessions are needed, and strict photoprotection must be carried out throughout the treatment period.^[9,10]

Microneedling

Physical treatment using dermarollers/micro-needling devices is used for the treatment of hyperpigmentation in addition to their use as a form of transdermal drug delivery. Microneedling creates micron-sized pores through the epidermis to allow the entry of therapeutic molecules into the epidermis and dermis. Following micro-needling, skin-lightening agents manufactured for this purpose, such as Vitamin C and tranexamic acid, are applied immediately after the procedure.^[11]

Intense pulsed light (IPL)

IPL therapy is the use of flash lamp light sources with wavelengths between 515 nm and 1200 nm. This light targets both epidermal and dermal pigmentations and is usually used to treat localized conditions on the skin.^[12]

Table 3: Mechanism of action of skin-lightening procedures practiced in India.

Procedure	Mechanism of action
Microdermabrasion	Mechanical exfoliation of epidermal melanin
Chemical peels	Controlled destruction of portions of the epidermis and/dermis leading to exfoliation of pigment laden superficial layers
Microneedling	Micropores facilitate the entry of skin lightening agents into the epidermis and dermis
Intense pulsed light	Differentiation of keratinocytes due to thermal heating results in upward transfer and elimination of melanosomes along with necrotic keratinocytes
Q-switched lasers	Pico lasers generate shorter laser pulse duration resulting in pigment fragmentation of melanin granules
Non-ablative fractionated resurfacing laser	Creates selective columns of microthermal damage, the transepidermal elimination of these zones helps in the removal of dermal melanophages

Q-switched lasers

Q-switched lasers (Nd: YAG 532 nm or 1064 nm) are used in India to treat pigmentary skin conditions such as lichen planus pigmentosus or skin tan. Pico lasers using low fluence are the preferred choice in dark skin individuals. Pico laser is safer than conventional Q-switched laser in treating pigmentary skin conditions as it removes pigment without inducing thermal damage.^[13] Multiple sessions are necessary usually 6–8 weeks apart, and treatment has to be performed with caution to prevent post-inflammatory hyperpigmentation. Relapses are quite common and must be followed with topical skin-lightening agents.

Non-ablative fractionated resurfacing laser

Fractional resurfacing using 1440 nm or 1540 nm infrared wavelength creates selective columns of microthermal damage.^[14] The transepidermal elimination of these microthermal treatment zones helps in the removal of dermal melanophages.^[15] Therefore, while sparing the epidermis, this treatment is beneficial in treating dermal melanocytosis such as nevus of Ota or dermal melasma. Recent evidence suggests that non-ablative fractional photothermolysis may also improve the uptake of topical drugs.^[16] This laser-assisted drug delivery offers an effective way to deliver skin-lightening agents to treat dermal pigmentation, for which topical agents have limited efficacy due to poor penetration.

COMPLICATIONS OF SKIN-LIGHTENING PRACTICES IN INDIA

In India, one can obtain all skin-lightening products from a pharmacy without a prescription. A complete list of ingredients, especially in products that are not regulated through proper channels, is seldom disclosed. Cutaneous and systemic side effects of skin-lightening agents are likely underestimated and under-reported. Hydroquinone preparations used for long periods cause exogenous ochronosis, due to deposition of homogentisic acid in the skin. Super potent corticosteroids cause addiction leading to topical steroid disfigured facies, a common menace seen in India. Unregulated use of intravenous glutathione by non-medical personnel has led to anaphylaxis, hepatic, neurologic, and renal toxicity, and Stevens-Johnson syndrome.

CONCLUSION

Skin-lightening practices have a long and interesting history. While old practices still exist in rural areas, modern technologies such as skin-lightening agents, chemical peels, and lasers have become popular among Millennials. In India, there is a yearning for skin-lightening practices among men and women as there is still rampant darker skin stigma across the continent, which correlates lighter skin tone with beauty and personal success. The need of the hour for dermatologists is to counsel patients with a quest for skin lightening and offer safe yet effective treatment.

Declaration of patient consent

Patient consent is not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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