

The Prevalence and Risks of Skin Whitening Products: A Global Health Concern

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ABSTRACT

Skin whitening" is the word for lightening the tone of the skin by artificial means such lotions, creams, injections, and washes. Sadly, the appeal of these skin-whitening treatments stems from people's worldwide fixation with skin tone. Melanocytes are specialized cells that create melanins. They are mainly found in the eyes, hair bulbs, and skin. There are two primary forms of melanin: pheomelanins, which are red or yellow, and eumelanins, which are brown or black. Mammals usually contain a combination of the two categories. Heightened output and accumulation of melanin, which is present in many skin conditions like hyperpigmentation. Such as sun lentigo, post-inflammatory melanoderma, melanoma, etc. There are various methods of treatment for these issues, such as pharmacological medicines or physical therapies.

I. INTRODUCTION

Melanocytes at the dermal-epidermal junction produce melanogenesis, or melanins, which are polymorphous and multifunctional biopolymers that comprise eumelanin and pheomelanin. Melanogenesis takes place within intracellular organelles called melanosomes. Dendrites carry melanosomes into the cytoplasm of nearby keratinocytes, where their function in photoprotection is crucial. Melanogenesis is an intricate process in which includes a number of enzymes and both chemical and enzymatic reactions: tyrosinase (a glycosylated polyphenol oxidase including phenylalanine hydroxylase, copper) as well as TRP-1 (tyrosine-related protein)

and TRP-2 (also known as dopamine tautomerase) ^[1].

In order to lighten skin tone or improve complexion, skin lightening is defined as "the technique of utilizing chemicals or any other substance with depigmenting potential; these goals are achieved by decreasing the concentration of melanin to achieve a reduction in the skin's physiological pigmentation ^[5]. Items utilized to accomplish this goal are well-known as chemicals for skin lightening, depigmenting, bleaching, brightness, or evening ^[2]. Numerous skin-lightening substances have been created and are currently offered for both medicinal and cosmetic uses. Medicinal uses for whitening skin products include primarily focused on treating pigmentation issues including discoloration brought on by hormone fluctuations, age spots, melasma, senile/solar lentigo, and post-inflammatory pigmented acne scars and hyperpigmentation, as they lessen the hyperpigmentation of certain bodily parts ^[3].

Agents of the brightness of the skin can operate through different mechanisms: inhibition of tyrosinase transcription (for example, Trétinoine, Retinol), inhibition of tyrosinase (for example, hydroquinone, Azélaica acid, resveratrol), the acceleration of epidermal renewal (lactic acid, glycolic acid), the inhibition of the transfer of melanosomes of melanocytes to surrounding keratinocytes, to anti-inflammatory action and attentive to free radicals, which all have an inhibition of tyrosinase as their common goal ^[5,6]. Many effective depigmenting compounds available today can only be used as a medication (for

example, hydroquinone, retinoic acid) and must be limited to use under dermatological supervision, while others are authorized in cosmetic products (for example, alcohols, arbutin, retinol, ascorbic acid). Development of new inhibitors melanin formation is very important in both the pharmaceutical industry and the beauty industry. These inhibitors are chemical synthesis screening of natural compounds and extracts^[1]. In particular, the search for new skin-lightening ingredients is driven by the demand for natural products, and traditional plant derivatives, which are generally considered safer than synthetic compounds, are currently being investigated^[4,6,8,9].

According to the World Health Organization, unsafe skin bleaching, when done without expert advice, is a public health crisis^[5]. Some skin lightening products (SLPs) contain mercury, hydroquinone and corticosteroids, which have been linked to severe dermatological, nephrological and neurological side effects^[6]. More than 60% of users speech-language pathologists may suffer from at least one complication^[7]. Possible effects of using hydroquinone for skin whitening include post-inflammatory effects. Pigmentation disorders, irritant dermatitis, and allergic contact dermatitis^[7]. An important issue addressed in several of these articles is hydroquinone-induced ochronosis.

CLASSIFICATION OF DEPIGMENTING ACTIVITY AND SKIN WHITENING AGENTS:

Hair loss can be obtained by (i) transfer and activity adjustment of melano absorption and distribution in recipients (II) Interventions in the maturation cells and (III) melanosome mature and movement. But as a result of the important role played by tyrosinase in the most white melanin luxury agents especially act to reduce enzyme functions to some mechanisms^[12]. Therefore, tyrosinase inhibitors are increasingly important in cosmetics, Pharmaceuticals used to prevent pigmentation and skin whitening^[13].

SKIN WHITENERS IN COMMERCIAL USE

1. **Mercury containing compounds:** The toxic compounds, such as mercury containing compounds have been used for skin whitening purposes because mercury inactivates the enzyme that leads to the production of melanin. Long term use of mercurial products makes the skin darker, because the mercury is

deposited in the epidermis and hair follicles^[14].

2. **Hydroquinone:** Its bleaching properties were discovered when it was observed that colored tanners wearing rubber gloves developed discolored spots on their hands and forearms. Hydroquinone is a hydroxyl phenolic compound that inhibits melanin synthesis by inhibiting the enzyme tyrosinase. Materials and methods of hydroquinone is currently the most widely used depigmenting agent, but it is highly cytotoxic to melanocytes and potentially mutagenic to cells in mammals^[15].
3. **Corticosteroids:** Topical corticosteroids whiten the skin through an initial whitening effect that: causes vasoconstriction, slows skin cell renewal, and reduces the number and activity of melanocytes. Local side effects of topical corticosteroids include spread and worsening of untreated infection; irreversible thinning of the skin, contact dermatitis, perioral dermatitis, acne^[4].
4. **Ascorbic acid (vitamin C):** Ascorbic acid and its derivatives are used as an antioxidant due to its ability to reduce o-dopaquinone to DOPA, preventing the formation of melanin, and also has a protective effect against skin damage, caused by UV radiation. Ascorbic acid has other adverse effects as well. Due to trace amounts of metal ions, it induces a significant increase in free radicals^[16].
5. **Laser treatment:** Ablative and non-ablative lasers can have significant effects on the Melasma. Lasers work by emitting a high-intensity monochromatic energy source that is absorbed by the melanin in the skin. The absorption of energy destroys the melanin. Side effects of laser treatment include discomfort, redness, mild swelling, and post-inflammatory hyperpigmentation^[16].

SIDE EFFECT ON SKIN:

Ingredients in skin-whitening lotions work to reduce the amount of melanin produced in the skin's outer layer^[10]. Products with robust chemicals can aid in treating hyperpigmentation-related issues; nevertheless, chemical-based skin whiteners pose serious health hazards and may be hazardous when used for lengthy periods of time. Historically, substances including hydroquinone, mercury, and steroids have been found in skin-whitening cosmetics. Even if the use of these substances is prohibited in some nations, doctors may nonetheless prescribe substances like

hydroquinone^[11]. The primary risk associated with skin and body exposure to these harmful chemicals is the potential for long-term negative side effects

and major health issues, such as skin discoloration, internal organ and nervous system malfunctions, and an elevated risk of cancer.

Ingredients	Mode of use	Adverse effects	Severe Adverse reaction
Hydroquinone (2% or 4%)	Topical	Contact dermatitis; corneal melanosis; conjunctival hyperpigmentation	Peripheral neuropathy; fetal growth retardation
Class 1 Steroids (clobetasol, Betamethasone)	Topical	Contact dermatitis; acne; folliculitis; Hypertrichosis	Cushing syndrome, diabetes, Hypertension
Mercury	Topical	Gastrointestinal discomfort; dermatitis; Hyperpigmentation	Neuropsychiatric toxicity, nephrotoxicity
Glutathione	Topical, Oral, injectable	Contact dermatitis; Cramping and bloating	Hepatic, neurologic and renal toxicity
Retinoids	Topical, oral	Erythema and peeling; Retinoid dermatitis	Teratogenic and fetal complications; thyroid dysfunction
Cysteamine	Topical	Burning sensation; sulfur odor	-----
Kojic acid (1%-4%)	Topical	Contact dermatitis; photosensitivity	-----
Arbutin (1%)	Topical	Contact dermatitis; Irritation	-----
Camphor	Topical	Contact dermatitis; irritation	Neurotoxicity-seizures and vision loss; burns when heated

II. RECOMMENDATION

- Data collection to study side effects associated with the use of SL products should be conducted regularly, and retrospective cross-sectional studies should also be conducted to analyze the most common side effects when these products are used over a long period of years. We need to establish a clearer link between the use of these products and the prevalence of certain skin diseases in our cities.
- Increase awareness and knowledge among women as well as men about the health risks of chronic consumption without medical supervision.
- Health education programs should target women through various media options, including leaflets, television, and radio. Education of the public on the risks of bleaching product use is imperative and would mitigate the side-effects of their use.
- You need to check the sales and marketing of SL products. This can be done by imposing a fine and fine marketing specialist in these products.

- This is very worried, and the task is necessary for the main decision -made and the health authorities to prevent the distribution of these drugs without a prescription

III. CONCLUSION

It is important to regulate and monitor the use of lightening products. The abuse of lightening products should be reduced through increased awareness. Distribution in the global market, skin lightening cosmetics containing illegal and toxic ingredients are now a growing public health problem, health control; products containing banned ingredients are readily available in many markets. The toxicity of skin lightening ingredients is a serious concern for human health. End users often use homemade mixtures of different products, sometimes with unpredictable toxic effects. Awareness of this issue needs to be raised among people and communities who regularly practice skin lightening. To achieve this objective, appropriate public information and education campaigns need to be developed to raise awareness of the risks associated with the use of inappropriate products. This must be done by taking into account

the cultural and socio-economic reasons why people whiten their skin and by offering culturally appropriate solutions.

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