

A Review of Motivations for Engaging In Cosmetic-Skin Lightening Practice in Sub-Saharan Africa and Mechanisms of Actions of Commonly Used Whitening Agents

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Abstract

Skin lightening refers to the use of depigmenting agents to transform the skin complexion to a lighter tone. Therapeutic skin lightening may be undertaken in controlled medical situations to manage certain hyperpigmentation disorders such as melasma, solar lentigo and vitiligo. On the other hand, cosmetic skin lightening is the use of skin lightening agents solely for aesthetic purpose to obtain a reduction in the skin's physiologic pigmentation. Motivations for engaging in cosmetic skin lightening practice in sub-Saharan Africa has been alluded to a number of political, social and aesthetic purposes. The practice of cosmetic skin lightening is not limited by gender, age, socio-economic status or educational qualifications however; it is most prevalent among women in sub-Saharan region Africa. Common depigmenting agents identified in most topical skin lighteners in the region have been reported to contain hydroquinone and corticosteroids although they are not often stated on the ingredients lists. This review will explore the practice of cosmetic skin lightening in sub-Saharan Africa, motivations for engaging in the practice and examine mechanisms of actions of hydroquinone and corticosteroids.

Keywords Cosmetic skin lightening; Whitening agents; Skin-lightening agents; Hydroquinone; Corticosteroids; Depigmenting agents; Sub-Saharan Africa

Introduction

A high prevalence of cosmetic skin lightening practice has been reported across sub-Saharan region of Africa. Cosmetic skin lightening is such a commonplace phenomenon in sub-Saharan African region with special names coined to describe the practice in different

countries. In Senegal, it is called xessal, in Mali, tcha-tcho, in Gabon, ambi, in Congo, maquillage, in South Africa, ukutsheyisa or ukutcreamer, and in Rwanda, kwitukuza [1-6]. The practice is not limited to adults alone and the prevalence in adolescents is as high as that of adults. A prevalence of 65.5% amongst secondary school students was reported in Ghana [7]. Likewise, 51.6% of high school students in Sudan reported to practice cosmetic skin lightening [8]. Young university students have also been reported to engage in the practice with studies in Cameroon and Zimbabwe reporting 27.3% and 20% prevalence respectively [9,10] (Table 1).

Author/ Reference	Country/	Prevalence	Motivations
Adebajo, (Nigeria) [11]		77.3% -- Females, 72.4%; Males, 27.6%	Look more attractive, appear fashionable, treat skin blemishes, cleanse the skin and impress the opposite sex
Ajose, (Nigeria) [12]		Females, 40%; Males, 2%	Dependence, to lighten the skin colour, to achieve a uniform skin tone, and to improve skin appearance prior to an important event
Amodu et al. (Nigeria) [13]		Females, 48.1%	Not specified in study
Atadokpede et al. (Republic of Benin) [14]		36.6% -- Females, 66.9%; Males, 33.1%	Lighten the skin colour, improve the skin appearance, cure skin defects and prevent rebound hyperpigmentation
del Giudice & Yves (Senegal) [6]		Females, 26%	Not specified in study
Dlova et al. (South Africa) [15]		Not specified in study	Not specified in study
Dlova et al. (South Africa) [4]		Females, 37.2%	Reduce facial pigmentation, lighten the skin colour and treat acne

Durosaro et al. (Nigeria) [16]	Not specified in study	Entice male counterparts, raise social standing, look fashionable and communicate positive self-concept
Faye et al. (Mali) [5]	Not specified in study	Not specified in study
January et al. (Zimbabwe) [10]	Females, 20%	Not specified in study
Kamagaju et al. (Rwanda) [17]	27%	Enhance overall beauty, attract the opposite sex, achieve uniform and blemish-free skin, raise social standing and imitate others
Kouotou et al. (Cameroon) [9]	Females, 27.3%	Obtain a lighter skin colour, uniform skin tone, soft skin and attention from the opposite sex
Kpanake et al. (Togo) [18]	Not specified in study	Being fashionable, appearing important, looking attractive and obtaining personal gratification
Kuffour et al. (Ghana) [19]	Females, 39.2%	Change the skin colour, enhance beauty and impress and satisfy male partners
Lartey et al. (Ghana) [20]	50.30%	Not specified in study
Lewis et al. (Tanzania) [21]	Not specified in study	To be white, beautiful and European-looking, impress peers, attract and satisfy male partners, treat skin imperfections, have soft skin and counteract adverse effects of skin lightening
Mahe et al. (Senegal) [22]	Females, 52.7%	Not specified in study
Mahe et al. (Senegal) [23]	Females, 68.7%	Not specified in study
Nnoruka & Okoye (Nigeria) [24]	57.20%	Not specified in study
Osei et al. (Ghana) [7]	Females, 65.5%	

Table 1: Overview of studies investigating cosmetic skin lightening practice in Africa.

Literature Review

Motivations for engaging in cosmetic skin-lightening practice

The motivation for engaging in cosmetic skin lightening has been alluded to the complex interplay of a variety of factors [25]. In sub-Saharan Africa, the high prevalence of cosmetic skin lightening has been attributed to a number of political, social and aesthetic factors [2,26]. Political factors that have played a role in the high prevalence of cosmetic skin lightening in sub-Saharan Africa revolve around Colonialism, Apartheid and the domination of Africans by people of lighter skin tones. The suppression by the White Man during the Colonial Rule and preferential treatment of white South Africans during the Apartheid era influenced the black African's belief that individuals of lighter skin complexions were somewhat superior to dark-skinned persons [4,25,27].

Similarly, social and aesthetic factors that motivate skin bleaching emanates from the belief that the fair skin is more socially acceptable. According to Naidoo et al. "dark-skinned individuals are viewed as less intelligent, attractive and trustworthy than those with lighter skin" [25]. Thus, Blacks, especially women, feel the need to lighten their skin tone in order to look more beautiful and sophisticated, impress their friends, attract suitable marriage partners and improve their socioeconomic status [2,4,25,27].

Not surprisingly, women in sub-Saharan Africa were shown to engage in the practice of cosmetic skin lightening considerably more than their male counterparts. In Nigeria, Ajose recorded a male to female prevalence ratio of 2:40 [12], Cecile et al., on the other hand, observed the male to female practice distribution in a dermatologic

clinic in Cameroon to be 13:87 while Atadokpede et al. found a prevalence distribution of 67:33 among female and male youth respectively in Central Benin [14].

Given that greater societal pressure is often placed on women to look beautiful and acceptable, it is quite predictable that a higher degree of use of cosmetic skin lighteners would be found among members of this gender. Conversely, the higher level of skin lightening practice observed among young males in the study by Atadokpede et al. might emanate from the inherent need by young people, regardless of gender, to look sociable and be acceptable to their peers thus negating the gender differences in attention to appearance often observed at a much older age [14].

Commonly used cosmetic skin-lightening agents

Various chemical compounds have been reported to have skin-lightening effects however, majority of cosmetic skin lightening products in sub-Saharan Africa have been reported to contain hydroquinone and corticosteroids [8,14,17,24]. Their rapidity of action, easy accessibility and low costs were cited as reasons for the preference of these skin lightening agents [8,14,24]. Chronic usage of hydroquinone and corticosteroids however has been reported to cause cutaneous side effects such as ochronosis, striae, skin atrophy etc. Further, there are alarming reports implicating chronic usage of hydroquinone and corticosteroids with systemic health implications such as diabetes, nephrotic syndrome but research in this area is limited [1,26,28-31].

Hydroquinone

Hydroquinone is often used in clinical settings to treat hyperpigmentation conditions however, cosmetic products containing up to a maximum of 2% hydroquinone concentrations can be safely sold over the counter in most countries [1,3,28,29]. Hydroquinone has been reported to be one of the most effective depigmenting agents [1,31]. It causes skin-lightening effects through interplay of several mechanisms. Hydroquinone primarily causes skin-lightening effects by inhibiting enzyme tyrosinase. It covalently binds to histidines or copper at the active site of tyrosinase inhibiting nearly 90% of tyrosinase enzyme resulting in reduction of skin pigmentation. Additionally, it inhibits melanin production competitively by inhibiting sulfhydryl groups and acting as a substrate for tyrosinase. This reaction generates quinones and reactive oxygen species which oxidise membrane proteins and lipids, inhibit DNA and RNA synthesis. This interferes with melanosome formation and maturation [1,2,25, 28-33].

Corticosteroids

Corticosteroids are pharmacological compounds used primarily in the treatment of inflammatory disorders of the skin [24]. Some of the commonly used topical steroids to lighten the skin in sub-Saharan Africa were betamethasone propionate, clobetasol propionate triamcinolone acetonide and fluocinolone acetonide [6,8,23,24,32]. Corticosteroids have the capacity to lighten the skin tone within a remarkably short time frame [27]. Corticosteroids ability to lighten the skin is mediated through initial diffuse vasoconstriction which gives the impression of instantaneous depigmentation. Subsequently, skin lightening is achieved by inhibiting melanocyte turnover and synthesis of melanocyte stimulating hormone [1,26,28].

Discussion and Conclusion

There is significant widespread use of cosmetic skin lightening products in sub-Saharan Africa. However, the rate of use varies widely from one country and/or region to another. Even though there is an increase of men engaging in the practice, a higher degree of use of cosmetic skin lighteners is found amongst females due to societal pressure placed on women to look beautiful and acceptable.

Hydroquinone and corticosteroids which are the commonly used skin-lightening agents act as skin lighteners by restricting melanin biosynthesis in the skin or by degrading existing cutaneous melanin stores.

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