

# Skin Bleaching and Dermatologic Health of African and Afro-Caribbean Populations in the US: New Directions for Methodologically Rigorous, Multidisciplinary, and Culturally Sensitive Research

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Received: September 19, 2016 / Published online: November 11, 2016  
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## ABSTRACT

Skin-bleaching practices, such as using skin creams and soaps to achieve a lighter skin tone, are common throughout the world and are triggered by cosmetic reasons that oftentimes have deep historical, economic, sociocultural, and psychosocial roots. Exposure to chemicals in the bleaching products, notably, mercury (Hg), hydroquinone, and

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steroids, has been associated with a variety of adverse health effects, such as Hg poisoning and exogenous ochronosis. In New York City (NYC), skin care product use has been identified as an important route of Hg exposure, especially among Caribbean-born blacks and Dominicans. However, surprisingly sparse information is available on the epidemiology of the health impacts of skin-bleaching practices among these populations. We highlight the dearth of large-scale, comprehensive, community-based, clinical, and translational research in this area, especially the limited skin-bleaching-related research among non-White populations in the US. We offer five new research directions, including investigating the known and under-studied health consequences among populations for which the skin bleach practice is newly emerging at an alarming rate using innovative laboratory and statistical methods. We call for conducting methodologically rigorous, multidisciplinary, and culturally sensitive research in order to provide insights into the root and the epidemiological status of the practice and provide evidence of exposure-outcome associations, with an

ultimate goal of developing potential intervention strategies to reduce the health burdens of skin-bleaching practice.

**Keywords:** Clinical research; Dermatology; Environmental health; Skin bleaching; Skin of color

## CURRENT CONTEXT

Skin-bleaching practices, such as using skin-lightening creams and soaps to achieve a lighter skin tone or to “whiten” skin, are common among non-White populations throughout the world, triggered by deep historical, economic, sociocultural, and psychosocial roots [1–5]. The exact prevalence of this practice among different population groups across different geographic areas is not known, and the existing estimates (e.g., 25–67%) have most likely been underestimated, since some women may be reluctant to admit the practice because of the stigma surrounding these complexion-altering behaviors [6, 7]. In addition, skin bleaching is becoming more common among men and young adults, including teenagers [3, 5, 8]. Prenatal exposure is also likely since pregnant women have been reportedly using skin-bleaching products [9, 10]. While skin-bleaching research has been heavily focused on darker-skinned African populations, it has become an increasing concern in Jamaica and other Afro-Caribbean countries [6, 8, 11]. More specifically, Hope [5] has posited that for Jamaicans, skin-bleaching practices have transitioned from historically being a response to economic and complexion-related oppression of the darker-skinned working class and poor

populations to a current expression of “...fashion and ungended rites of beauty.”

Skin bleaching has been associated with a variety of known adverse health effects ranging from dermatitis to exogenous ochronosis (Fig. 1), steroid acne (Fig. 2), mercury (Hg) poisoning, and nephrotic syndrome, which are linked to ingredients such as hydroquinone, corticosteroids, and Hg [1, 4, 6, 12–18]. Due to health concerns, some of these chemicals are regulated [19–23]. However, studies have found products containing the aforementioned ingredients with above legal limits, including products from the USA and European Union, where regulations are stricter and better implemented. In addition, access to a variety of legal and illegal skin-bleaching products—including prescription strength hydroquinone and topical corticosteroids—is made easy through online purchases, global travel, and immigration [17, 18, 24–26].



**Fig. 1** Exogenous ochronosis on the face of a woman with a history of hydroquinone use



**Fig. 2** Steroid acne on the chest following use of a corticosteroid containing bleaching cream for over 1 year

Skin bleaching is not uncommon in the US, and the health burden of skin-bleaching practices is not evenly distributed among the population. The 2004 New York City (NYC) local health and nutrition examination survey identified skin care product use as an important route of Hg exposure, especially among Caribbean-born blacks and Dominicans in NYC, with mean urine Hg concentrations 1.3–2.1 times higher than that of whites and other racial/ethnic groups [26]. Despite these reports, surprisingly sparse epidemiological studies are available regarding the health impacts of skin-bleaching practices on Afro-Caribbean immigrant groups in the US. In fact, this topic has gained very little attention among clinical and translational researchers in the US, with existing studies primarily limited to investigations of outbreaks of Hg poisoning related to the use of skin-whitening products [27–29].

## NEW DIRECTIONS

Thus, we have proposed five new directions for research in this area. First, we must comprehensively estimate the prevalence of

skin bleaching among both previously studied populations and populations, like those from Afro-Caribbean countries such as Jamaica, for which this practice is newly emerging at an alarming rate. While it is easier to focus just on newly emerging populations by geography, we should also examine the prevalence of this practice among other under-studied risk groups such as men, younger populations, and pregnant mothers.

Second, besides the known dermatologic effects of skin bleach, such as dermatitis, exogenous ochronosis, and acne, we should also expand our focus to long-term health consequences such as cancer as well as interactions between physical and psychosocial health outcomes. The potential carcinogenic effects of this practice may not be solely limited to exposure to hydroquinone, a primary metabolite of benzene, which is not currently classified as carcinogenic to humans because of conflicting results, though recent evidence suggests that hydroquinone can generate DNA damages and immunosuppressive responses [18, 25, 26, 30–34]. Attention should also be given to potential increased susceptibility to skin cancer resulting from alterations of melanin production among those who practice skin bleaching, especially among populations living in tropical regions with strong UV radiation. While their darker skin is considered to be protective of sun-induced skin cancer, the carcinogenic effect of melanogenesis inhibition resulting from skin bleaching remains to be explored [35, 36].

Third, we should identify all skin-bleaching products used and scientifically evaluate ingredients such as metals, hydroquinone, and the steroid composition of these exposures using specialized laboratory methods [37, 38]. Most existing studies focus on only one of the

ingredients in these beauty products, which has hindered investigations of the health effects of exposure to mixtures from multiple ingredients. In addition, because self-mixing of a variety of chemicals (e.g., combining multiple commercial skin-bleaching products with hydrogen peroxide) is not uncommon, investigations of harmful chemical compositions in these home-made products should also be considered.

Fourth, we should empirically compute the dose-response relationships between the aforementioned exposures and associated dermatologic outcomes across various usage patterns and durations, which also require using innovative biomarkers to assess short- and long-term exposures to skin-bleaching products.

Last, but not the least, we posit that an integrative approach that brings together a multidisciplinary team of experts in dermatology, environmental epidemiology, biostatistics, pharmacology, behavioral psychology, and community health will be best suited to tackle this complex public health problem. This would allow for a large-scale, methodologically rigorous approach that can simultaneously explore the psychosocial motivations underlying this practice, the toxicological risks, and causal relationships between skin-bleaching product-related exposures and health outcomes. Existing studies often employ a single-aspect design highlighting only one of three topic areas: (1) psychosocial implications, (2) dermatological health effects, or (3) an exposure assessment of the skin-bleaching practice. A well-designed, comprehensive integrative study would give researchers the latitude to investigate the underlying roots and epidemiologic status of skin bleaching while simultaneously providing evidence of

exposure-outcome associations, which would serve as a necessary strategy if our ultimate goal is to develop efficacious interventions that can effectively reduce the health burdens of this practice.

However, we understand that this interdisciplinary undertaking is challenging, given many in these communities, as we have observed at our institution, may not associate skin-related changes to their skin-bleaching practices. Limited access to dermatologists among the population at risk may also contribute to under-detection of complications of skin bleaching. Moreover, the underlying stigma surrounding this behavior might prevent these individuals from communicating their concerns to clinicians whom they perceive to have inadequate understanding of the cultural context. While these are all challenges that we must work on with these communities to overcome, from a research perspective, we still have a major difficulty in identifying patients with specific diagnoses resulting from skin bleaching because identifying cases requires an index of suspicion on the part of the clinician and specific inquiry into skin care practices, which may not be performed consistently or documented in the medical record [14].

## CONCLUSION

In summary, if we are to adequately care for clinically vulnerable, skin-bleaching subpopulations of the African and Afro-Caribbean immigrant communities, and other under-studied populations in the US, we must first understand the magnitude of the problem, draw valid causal inference about the harmful exposures from the skin-bleaching products and their resulting health problems, and subsequently provide culturally sensitive

solutions that do not further stigmatize these populations. This is especially important since skin bleaching may be a rational response to being born in racially and economically segregated societies, even if this practice may be viewed less favorably in the clinical and translational sector.

## ACKNOWLEDGEMENTS

Sponsorship for this study was funded by a Transdisciplinary Center on Health Effects of Early Environmental Exposures P30 Core Center pilot grant (P30ES023515) at the Icahn School of Medicine at Mount Sinai. The authors would also like to acknowledge Ms. Richa Deshpande, a graduate research assistant at the Icahn School of Medicine at Mount Sinai, for her editorial assistance in the revision phase of the manuscript submission process. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this manuscript, take responsibility for the integrity of the work as a whole, and have given final approval for the version to be published.

**Disclosures.** E.K.T. Benn, B. Liu, I.A. Khan, Y.-H. Wang, N. Mohamed, and A. Alexis have nothing to disclose.

**Compliance with Ethics Guidelines.** This article is based on previously conducted studies and does not involve any new studies of human or animal subjects performed by any of the authors.

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