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Epidemiology of Chronic Dermatologic Conditions in Skin of Color

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ABSTRACT

Across the board, common dermatologic conditions disproportionately affect patients of color. While the causes of these disparities have been tied to the environment, societal structure, access to care, health literacy, and biological factors, there is limited understanding of the extent and impact of dermatologic healthcare inequity. This study provides a resource on the epidemiology of common dermatologic diseases across racial lines and points out current lapses in scientific understanding of the disparate impact of certain conditions.

This study will review epidemiological data on atopic dermatitis (AD), adult acne, pseudofolliculitis, dermatophytosis, psoriasis, vitiligo, melasma, hyperpigmentation, keloids, hidradenitis suppurativa (HS), basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma.

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INTRODUCTION

Traditionally, the highly visual field of dermatology has relied on textbooks and images of diverse pathologies in lighter skin. In recent years, this lapse in education has been highlighted in numerous commentaries and publications.[1,2] Textbooks have begun to address the need to present dermatologic pathologies in skin of color (SOC).[3] These changes are key to addressing disparities in dermatologic outcomes, with prior research showing delayed diagnosis and worse outcomes in patients with Fitzpatrick skin types (FPS) IV-VI.[4-7]

Certain conditions such as atopic dermatitis (AD), acne, tinea, and psoriasis have varied or distinct appearances in SOC compared to their presentation in white skin.[8-11] Also, conditions such as vitiligo, melasma, and post-inflammatory hyperpigmentation may be more noticeable in SOC due to

TABLE 1.

Prevalence of Common Conditions in the United States by Race

Condition	White	Black	Hispanic/ Latino	Asian	Other	Overall	Literature
Acne*	24%	37%	32%	30%	--	26.70%	Perkins[24] et al (2011)
Atopic Dermatitis	10.50%	7.70%	7.80%	--	14.60%	7.2 - 10.2%	Silverberg[21] et al (2013), Chiesa[14] et al (2018)
Dermatophytosis	--	v	--	--	--	20 - 25%**	Havlickova[25] et al (2008)
Hidradenitis Suppurativa	0.75%	1.30%	0.07%	--	0.17%	0.10%	Sachdeva[22] et al (2021)
Pseudofolliculitis	--	45 - 83%	--	--	--	--	Nussbaum[28] et al (2019)
Psoriasis	3.60%	1.50%	1.90%	--	3.10%	3%	Armstrong[19] et al (2021
Keloids	0.09%	4 - 16%	--	0.10%	--	--	Gauglitz[30] et al (2011), Glass14 et al (2017)
Dyschromias							
Hyperpigmentation	0.1 - 1.7%	0.7 - 9.0%	--	--	0.50%	--	Davis[34] et al (2010)
Melasma***	--	--	1.5 - 33.3%	<40%	--	1 - 50%	Handel[31] et al (2014), Pichardo33 et al (2009)
Vitiligo****	--	--	--	--	--	0.5 - 2%	Picardo[23] et al (2015)
Skin cancer							
SCC	--	--	--	--	--	--	--
BCC	--	--	--	--	--	30%	American Cancer Society[41] (2000)
Melanoma	5.46%	3.37%	--	--	--	5.02%	SEER[38] (2021)

*The patient population in this study was exclusively female. **Prevalence rates are worldwide estimates. ***This estimate is based on a review of multiple international cohort studies, including high-risk patient populations. ****Vitiligo has been shown to have consistent prevalence across all races.

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TABLE 2.

Incidence of Skin Cancers in the United States by Race (per 100,000)

Condition	White	Black	Hispanic/ Latino	Asian	Other	Overall	Literature
SCC (1990 - 2019)	--	--	--	--	--	262.0	Aggarwal[40] et al (2021)
BCC (1998 - 2012)	1035.0	9.0	63.0	21.0	-	525 - 535	Asgari[37] et al (2015)
Melanoma (2015 - 2019)	31.1	0.9	4.4	1.3	--	12.7 - 21.5	SEER[38] (2021)

contrast from healthy skin,[12,13] Patients with FPS IV-VI skin are more likely to experience complications of dermatitis and wound healing, including keloids.[14] In addition to disparities in outcomes, SOC patients have an increased incidence of certain dermatologic conditions, including hidradenitis suppurativa (HS), acral lentiginous melanoma, and folliculitis (pseudofolliculitis barbae/nuchae).[15-17]

This publication consists of identifying records in PubMed on common dermatologic conditions in SOC and compiling a resource for their incidence and prevalence specific to race. Table 1 and Table 2 compile previously collected data on the incidence and prevalence of the aforementioned conditions in the United States.

DISCUSSION

There is ample data on the prevalence of atopic dermatitis, HS, and psoriasis in adults across racial groups in the literature. Data on these conditions show significant differences among different races and ethnicities.[18] AD and psoriasis are more common in White patients, with diagnoses of AD in 10.5% of White patients and 7.7% of Black patients, and diagnoses of psoriasis in 3.6% of White patients compared to 1.9% of Black patients.[19-21] HS is more common in SOC, with rates in black patients (1.3%) nearly double those of White patients (0.75%).[17,22] Vitiligo is equally prevalent across racial lines, but depigmentation is more likely to be noticeable in SOC.[12,23] Also, according to one study, the difference in acne prevalence across racial groups is statistically significant in adult females, with White women least frequently being diagnosed (24%, compared to 26.7% overall).[24] There is limited data on prevalence in children and men, especially across racial lines.

The prevalence of dermatophyte infection across racial lines has not been well studied, and current prevalence estimates of 20-25% are based on worldwide data.[25] Research has shown that tinea capitis is more common in Black patients, while onychomycosis occurs more frequently in White patients.[26]

Pseudofolliculitis has been known to occur most frequently in Black patients, and there is a paucity of epidemiologic studies on the condition.[27] Most commonly, pseudofolliculitis has been studied in the military due to the high frequency of shaving demanded as part of the military dress code.[28] Similarly, keloids are most often observed in non-white skin.[14] Most epidemiologic research has been limited to cohorts of color, with some prevalence rates approaching 16% in wounds on SOC.[29,30]

The prevalence of melasma has not been well studied, and this estimate is based on a review of multiple international cohort studies, including high-risk patient populations.[31-33] While hyperpigmentary disorders have been shown to have some racial differences in prevalence, there is reasonable concern that differences in appearance on white vs non-white skin may contribute to rates of reporting.[34]

Skin cancers comprise 35-45% of all cancers in Caucasians, while they only make up 4–5% in Hispanics, 2–4% in Asians, and 1–2% in Black patients.[35] Despite this, skin cancer is associated with more significant morbidity and mortality in SOC.[36] This is likely due to delayed diagnosis and treatment, lack of access to care and decreased likelihood of screening, locations of atypical lesions such as the soles of the feet, and difficulty differentiating melanotic lesions from normal variation in clinical practice.[36]

It is challenging to study the epidemiology of non-melanoma skin cancer (NMSC) due to geographical differences in incidence, unreported cases, multiple carcinomas in the same patient, the commonality of curative treatment done by biopsy, and similar insurance codes. In addition, there is a lack of data on the incidence or prevalence of squamous cell carcinoma (SCC) by race. Some studies suggest SCC occurs at about a 4:1 ratio compared to basal cell carcinoma (BCC).[37]

The US SEER program is a good resource for data on melanoma prevalence in the US, and it shows an increased prevalence in White patients (1035 per 100,000) compared to 525-535 per 100,000 overall.[38] In Black patients, there is an increased incidence of melanoma in non-sun-exposed areas, like the bottom of the feet and palms.[39] This contributes to more extensive disease at the time of diagnosis in Black patients compared to their White counterparts.[40] In addition, studies have shown discrepancies in melanoma outcomes, with an estimated 5-year survival rate of 71% in Black patients compared to 93% in White patients.[41] This is likely due to more advanced stages in SOC on diagnosis.[42]

CONCLUSIONS

This study serves as a resource for the latest epidemiological trends on common dermatologic pathologies in SOC. These data are shown in Table 1 and Table 2. This study points out

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the different prevalence and incidence rates across races and notes where lapses in current data lie. To more adequately provide culturally competent care, it is necessary that a greater understanding of causality is determined. Of note, this study is not a systematic review, instead focusing on multiple studies on specific groups of patients from diverse backgrounds. While this highlights epidemiological differences and discrepancies in outcomes, it may limit the generalizability of the findings presented. Further research must be done into the environment surrounding conditions more prevalent in certain racial groups, especially regarding acne in adults, dermatophytosis, melasma, and NMSC.

DISCLOSURES

The authors have no conflicts of interest to declare.

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