Common Dermatologic Disorders in Skin of Color: A Comparative Practice Survey

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There is a paucity of data on the epidemiology of dermatologic disease in populations with skin of color. Our objective was to compare the most common diagnoses for which patients of various racial and ethnic groups were treated at a hospital-based dermatology faculty practice. We reviewed the diagnosis codes of 1412 patient visits from August 2004 through July 2005 at the Skin of Color Center at St. Luke's-Roosevelt Hospital Center, in New York, New York, in whom race and ethnicity were recorded. The most common diagnoses observed during dermatologic visits by black and white patients were compared. The leading diagnoses observed during the study period differed between black and white patients. During visits by black patients, the 5 most common diagnoses observed at our center were acne (ICD-9 [International Classification of Diseases, Ninth Revision] *706.1); dyschromia* (ICD-9 *709.09*)*; contact dermatitis and other eczema, unspecified cause* (ICD-9 *692.9*)*; alopecia* (ICD-9 *704.0); and seborrheic dermatitis* (ICD-9 *690.1). During visits by white patients, the 5 most common diagnoses recorded were acne* (ICD-9 *706.1); lesion of unspecified behavior* (ICD-9 *238.2); benign neoplasm of skin of trunk* (ICD-9 *216.5); contact dermatitis and other eczema, unspecified cause* (ICD-9 *692.9); and psoriasis* (ICD-9 *696.1). Although similarities were seen in the frequency of acne and eczema, conditions such as dyschromia and alopecia were commonly seen during black patient visits but were not among the leading 10 diagnoses made during white patient visits.*

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The prevalence, clinical presentation, and psychological impact of skin disease can vary between different racial and ethnic groups. Genetic, environmental, socioeconomic, and cultural factors are likely to contribute to these differences. As the US population becomes increasingly diverse, understanding racial and ethnic differences in dermatologic disease will be of growing importance. Few studies have investigated racial and ethnic differences in the epidemiology of dermatologic disease. Most published reports are based on data derived from practice surveys and individual clinical experience.[1] The 1995 National Ambulatory Care Medical Survey estimated there were 22 million office visits related to dermatologic disease that year. The 5 leading skin diseases (in order of frequency) that accounted for most dermatologic visits in the general US population were acne, contact dermatitis, hypertrophic and atrophic conditions of the skin, viral warts, and malignant neoplasms of the skin.[2]

The objective of the present study was to compare the frequency of common dermatologic disorders among patients of different racial and ethnic groups that presented to the Skin of Color Center at St. Luke's-Roosevelt Hospital Center in New York, New York, from August 2004 through July 2005. The ethnic populations we examined included black individuals (African, Caribbean black, African American), white individuals, Asians (Indian from the subcontinent, Cambodian, Chinese, Filipino, Hmong, Japanese, Korean, Laotian, Pakistani, Thai, Vietnamese), Hispanics/Latinos (Cuban, Mexican, Central American, South

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American, Puerto Rican, and other individuals of Latin American descent), and American Indians. Our goal was to help identify the leading diagnoses for which individuals of different races and ethnicities sought dermatologic care.

Methods

A retrospective chart review of diagnoses, as well as race and ethnicity, was performed for 1412 patient visits at the Skin of Color Center from August 2004 through July 2005. Data could not be recorded after July 2005 because the patient recording system at our institution became computer based and did not allow for entry of race and ethnicity. Inclusion into the survey required the physician or medical assistant to select the patient's race and ethnicity and record it in the patient's chart; choices were black, including all racial and ethnic groups of African and Caribbean descent; white; Asian; Hispanic/Latino; American Indian; or other. When the race and ethnicity was unclear, the patient's self-description was used. Visits for which race or ethnicity were not recorded were excluded from the study. Eleven physicians participated in the study. If a patient was seen more than once in the practice within the specified study dates, the subsequent visits were added to the data pool. From these files, diagnoses were charted and summarized. Of the 1412 patient visits entered into the data pool, 1074 (76.1%) were by black or white patients. Because of the substantially lower numbers of Asian, Hispanic/Latino, and American Indian patient visits, we decided to limit our analysis to visits by black and white patients. We hope to acquire further data from the other populations so an accurate comparison can be made.

Results

The leading diagnoses for dermatologic visits during the study period differed between black and white patients (Table). During visits by black patients, the 6 most common diagnoses observed at our institution were acne (*ICD-9* [*International Classification of Diseases, Ninth Revision*] 706.1); dyschromia (*ICD-9* 709.09); contact dermatitis and other eczema, unspecified cause (*ICD-9* 692.9); alopecia (*ICD-9* 704.0); seborrheic dermatitis (*ICD-9* 690.1); and lesion of unspecified behavior (*ICD-9* 238.2) (Figure 1). Hirsutism (*ICD-9* 704.1), folliculitis (*ICD-9* 704.8), and atopic dermatitis (*ICD-9* 691.8) were tied as the seventh most common diagnosis. Keloid (*ICD-9* 701.4) and vitiligo (*ICD-9* 709.01) were tied as the eighth most common diagnosis. Sebaceous cyst (*ICD-9* 706.2) and other specified diseases of sebaceous glands, such as asteatosis cutis and xerosis cutis (*ICD-9* 706.8), were tied as the ninth most common diagnosis. The tenth most common diagnosis made during visits by black patients was seborrheic keratosis (*ICD-9* 702.1).

In visits by white patients, the 10 most common diagnoses were acne (*ICD-9* 706.1); lesion of unspecified behavior (*ICD-9* 238.2); benign neoplasm of skin of trunk (*ICD-9* 216.5); contact dermatitis and other eczema, unspecified cause (*ICD-9* 692.9); psoriasis (*ICD-9* 696.1); seborrheic dermatitis (*ICD-9* 690.1); rosacea (*ICD-9* 695.3); actinic keratosis (*ICD-9* 702.0); viral warts, unspecified (*ICD-9* 078.10); and folliculitis (*ICD-9* 704.8)(Figure 2).

Similarities were observed in the frequency of acne and eczema. Although dyschromia and alopecia were the second and fourth most common diagnoses recorded for visits by black patients, respectively, neither condition was among the leading 10 diagnoses for visits by white patients.

Comment

Our survey highlighted the variability in skin disorders for which individuals of different racial and ethnic groups present to a dermatologist. There are many potential reasons for this variability. For example, skin of color has been shown to have several structural differences compared with white skin. Darkly pigmented skin is characterized by larger and more numerous melanosomes that contain more melanin and are more dispersed throughout the epidermis.[3,4] These photoprotective variations result in a lower incidence of skin cancers and less prominent or slower development of photoaging. Grimes and Stockton[5] reported a labile response of melanocytes to irritation and inflammation, making skin of color more susceptible to pigmentary disorders such as postinflammatory hyperpigmentation. Although the mechanism has not been completely elucidated, greater melanin synthesis, as well as abnormal distribution and transfer of melanin to keratinocytes in response to cytokines and inflammatory mediators, are thought to play a role. As expected, dyschromia (including postinflammatory hyperpigmentation and melasma) was the second most common diagnosis (19.9%) recorded for visits by black patients at our center.

Dermatologic visits for acne were the most common in both black (28.4%) and white (21.0%) patients. The pathophysiology of acne is not thought to differ by race and ethnicity.[6] Some studies have suggested a difference in sebaceous gland size and activity,[3,6-8] but the studies have involved small patient populations. Sebum production has not been shown to be significantly different in black and white skin.[3] Halder et al[9] examined the histopathology of facial comedonal, papular, and pustular lesions from 30 black females and found marked inflammation in all lesions that was out of proportion with the clinical presentation. The authors commented

Most Common Diagnoses in Black and White Patients*†

Diagnosis (*ICD-9* Code)	Frequency of Visits, n (%)
Black Patients	
Acne (706.1)	211 (28.4)
Dyschromia (709.09)	148 (19.9)
Contact dermatitis and other eczema, unspecified cause (692.9)	68 (9.1)
Alopecia (704.0)	62 (8.3)
Seborrheic dermatitis (690.1)	50 (6.7)
Lesion of unspecified behavior (238.2)	33 (4.4)
Hirsutism (704.1)	30 (4.0)
Folliculitis (704.8)	30 (4.0)
Atopic dermatitis (691.8)	30 (4.0)
Keloid (701.4)	19 (2.6)
Vitiligo (709.01)	19 (2.6)
Sebaceous cyst (706.2)	15 (2.0)
Other specified diseases of sebaceous glands (asteatosis cutis, xerosis cutis) (706.8)	15 (2.0)
Seborrheic keratosis (702.1)	14 (1.9)
Total	744 (100)
White Patients	
Acne (706.1)	90 (21.0)
Lesion of unspecified behavior (238.2)	89 (20.7)
Benign neoplasm of skin of trunk (216.5)	52 (12.1)
Contact dermatitis and other eczema, unspecified cause (692.9)	49 (11.4)
Psoriasis (696.1)	30 (7.0)
Seborrheic dermatitis (690.1)	28 (6.5)
Rosacea (695.3)	26 (6.1)
Actinic keratosis (702.0)	25 (5.8)
Viral warts, unspecified (078.10)	22 (5.1)
Folliculitis (704.8)	18 (4.2)
Total	429 (100)

*_ICD-9_ indicates _International Classification of Diseases, Ninth Revision._

†If a patient was seen more than once in the practice within the specified study dates, the subsequent visits were included in the data pool.

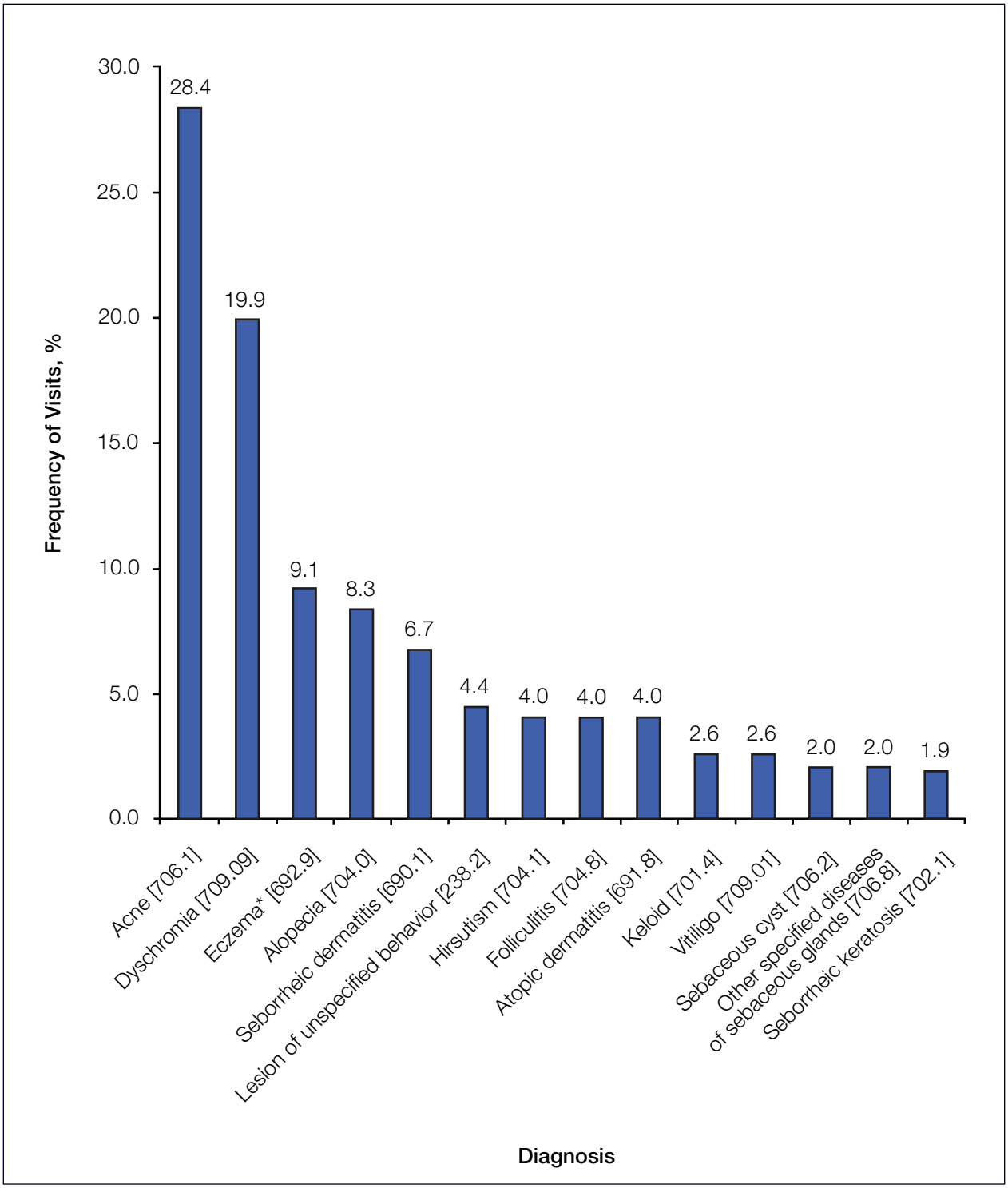

Figure 1. Most common diagnoses recorded during visits by black patients. *International Classification of Diseases, Ninth Revision (ICD-9),* code in brackets. Asterisk indicates *ICD-9* code for contact dermatitis and other eczema, unspecified cause.

that this inflammation may help to explain the higher incidence of postinflammatory hyperpigmentation in skin of color.[1,9]

In our study, the frequency of visits for eczema was similar in black and white populations. The category of eczema, as defined by *ICD-9* code 692.9, includes contact dermatitis and other eczema of unspecified cause, excluding atopic dermatitis. With regard to eczema, racial variations in skin permeability and skin irritability have been described. Black skin has been shown to

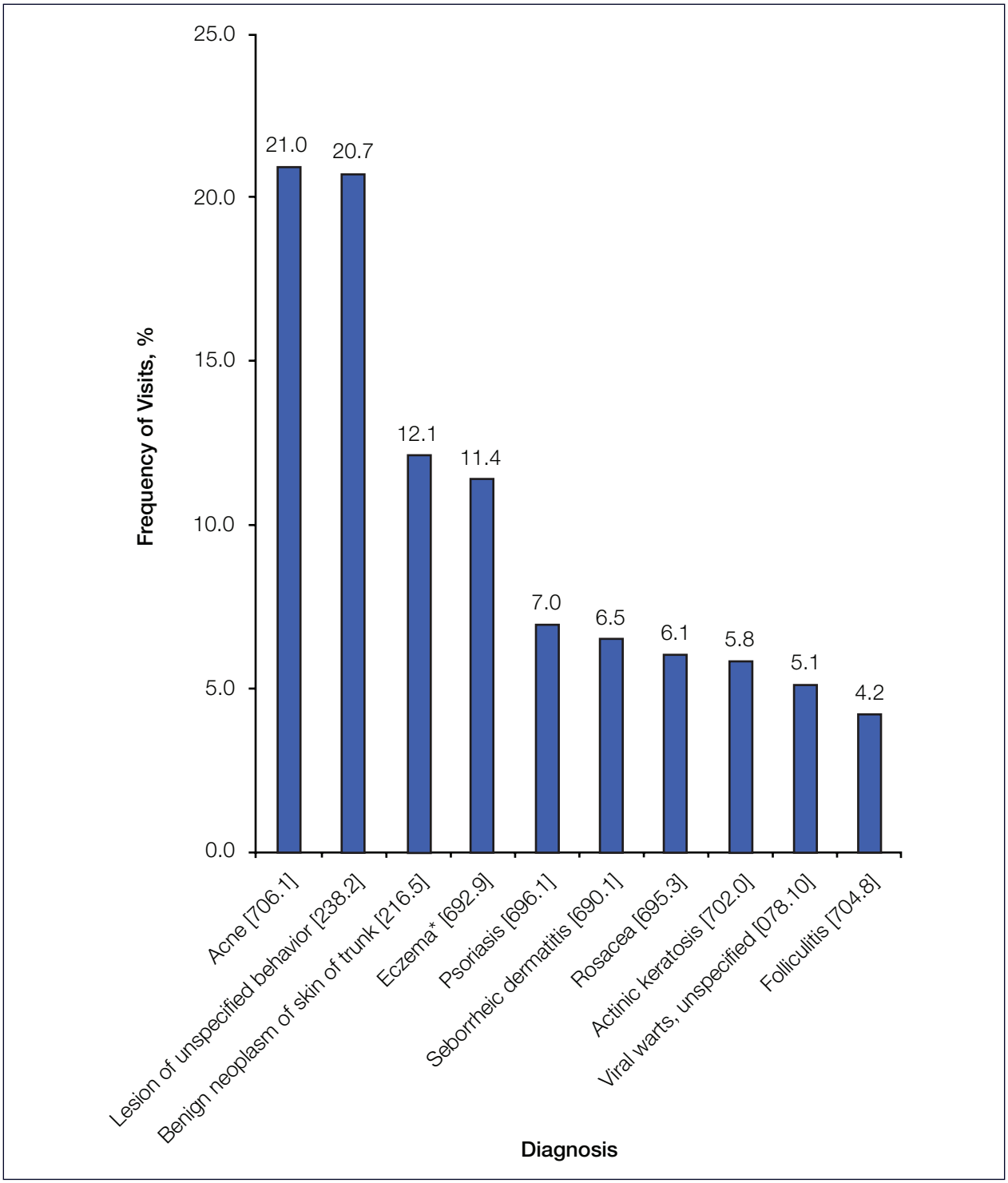

Figure 2. Most common diagnoses recorded during visits by white patients. *International Classification of Diseases, Ninth Revision (ICD-9),* code in brackets. Asterisk indicates *ICD-9* code for contact dermatitis and other eczema, unspecified cause.

have an increased number of stratum corneum layers, with increased cohesion and higher lipid content, which may allow for a stronger barrier to absorption and thus a higher threshold for irritation.[3,10,11] However, studies on differences in cutaneous absorption and barrier function have produced conflicting results. Some studies showed that white skin was more permeable to certain chemicals,[10,11] whereas a study by Wickrema Sinha et al[12] found no difference. Similarly, there are conflicting results about differences in skin irritability.

Kompaore et al[13] showed that baseline transepidermal water loss (TEWL) measurements were significantly higher in black subjects and Asian subjects compared with white subjects ($P<.01$). The authors concluded that black and Asian subjects are more susceptible to irritants because a higher TEWL value leads to a more compromised barrier function.[13] Wesley and Maibach[14] hypothesized that higher TEWL values and larger mast cell granules may contribute to differences in pruritus reported by different races. In contrast to the aforementioned studies on TEWL, Astner et al[15] in 2006 showed a significantly greater increase in TEWL after exposure to a skin irritant in white subjects compared with black subjects ($P\leq.005$). The same study showed that the concentration of irritant needed to produce a clinically apparent irritant reaction was significantly higher in black subjects versus white subjects ($P\leq.0001$). In addition, reflectance confocal microscopy showed more features of irritation in white subjects.[15] Similar to Astner et al,[15] Reed et al[16] examined TEWL measurements in different skin types and found that darker skin (Fitzpatrick skin types V and VI) displayed a more resistant barrier function. DeLeo et al[17] found no differences in the prevalence of allergic contact dermatitis but did find racial differences in response to specific allergens. For example, black subjects had a higher rate of sensitization to paraphenylenediamine and white subjects had a higher rate of sensitization to formaldehyde. The authors believed that racial and ethnic differences in allergen exposure may lead to these varied responses.[17]

In our study, 8.3% of dermatologic visits by black patients included a diagnosis of alopecia. For visits by white patients, alopecia was not among the leading 10 diagnoses. Structural differences in hair follicles may contribute to the racial and ethnic variations in the prevalence of scalp and hair disorders. The hair follicle in black individuals is curved and gives rise to a curly or tightly coiled hair shaft. This structural difference is thought to be associated with an increased prevalence of pseudofolliculitis barbae. Black individuals also have fewer elastic fibers that anchor the hair follicles to the dermis.[3] This fact, in addition to cultural practices such as hair braiding and use of chemical relaxers, weaves, and hot combs could explain the higher frequency of visits for alopecia and folliculitis in the black patients in our study. Interestingly, Sperling[18] found that the total hair density and total number of terminal hair follicles and terminal anagen hairs were significantly lower in black subjects compared with white subjects ($P<.001$).[4]

As mentioned, cultural practices impact the incidence of skin disease in different populations. While braids, twists, and cornrows can lead to temporary or permanent traction alopecia in black individuals, hair lubricants and oils can contribute to pomade acne, which manifests as comedones and papules in the forehead and temple regions.

Similarities can be seen when comparing our data to the previously reported US surveys of skin disease in ethnic populations. For example, for visits by black patients in our study, the top 5 diagnoses (acne, dyschromia, eczema, alopecia, and seborrheic dermatitis) were the same as the top 5 diagnoses in the 1983 survey by Halder et al,[19] albeit in a different order of frequency. Halder et al[19] listed the 12 most common diagnoses of 2000 black patients seen in private practices in the Washington, DC, area over 2 years. The diagnoses included acne vulgaris, eczema, pigmentary disorders other than vitiligo, seborrheic dermatitis, alopecia, fungal infection, contact dermatitis, warts, tinea versicolor, keloid, pityriasis rosea, urticaria, and benign tumors.[19] Other than the first 5 diagnoses, our data show differences, which may reflect changes in trends and the availability of treatments in 2004 to 2005 compared with 1983. For example, hirsutism and folliculitis (tied for the seventh most common diagnosis in our study for black patients) may be related to the current importance of cosmetic procedures in the United States. Many patients seek laser treatment for both hirsutism and pseudofolliculitis, a treatment that was not readily available in 1983. Halder et al[19] also reported the 5 most common diagnoses in 550 white patients, which included acne vulgaris, eczema, warts, benign tumors, and contact dermatitis. Although all 5 of these diagnoses were seen in the white patients in our study, their order of frequency differed. A study by Dunwell and Rose[20] of 1000 Afro-Caribbean patients during a 5-month period in Jamaica revealed acne vulgaris, seborrheic eczema, pigmentary disorders, and atopic dermatitis as the most common diagnoses, which were consistent with our results.

These data give the practicing dermatologist an overview of the common skin disorders they are likely to encounter in black versus white patient populations. However, our study has several limitations. First, the data came from a single center, with its corresponding patient population. The skin disorders seen at our center may not be generalizable to the overall black and white populations. Second, there is a potential for selection bias because participating physicians did not report race/ethnicity for all patients examined. The sparse data we obtained for Asian, Hispanic/Latino, and American Indian populations, as well as the low overall sample size of the study, were due to the limited entry of race and ethnicity information during patient visits. Third, we measured the frequency of diagnosis codes for patient visits as opposed to individual patients. As both new and follow-up visits were included in the

data pool, the frequency of a given diagnosis may be confounded by the number of follow-up visits made by an individual patient for that diagnosis. Despite this limitation, useful comparisons can be made vis-à-vis the leading skin disorders for which black and white patients seek dermatologic care. Moreover, the close similarity of our results to those reported in the 1983 study by Halder et al[19] validates our data. Other limitations include the fact that patient visit data were recorded for 11 instead of 12 months because of the institution's acquisition of a computer-based system that did not allow for the entry of race and ethnicity. In addition, having the physician or medical assistant categorize the patient's race/ethnicity is less reliable than self-reporting by the patient. If we had compared the descriptor's and the patient's categorization, we could have better assessed the validity and reliability of our classifications. Lastly, we did not separate the pediatric and adult data in our study; therefore, age-related differences in the frequency of skin disorders could not be examined.

In June 2006, the *Journal of the American Academy of Dermatology* published a colloquium on race, ethnicity, and skin of color.[21] The goal of this collection of articles was both to assess the validity, importance, and frequency of reporting race and ethnicity in medical literature, and to better define racial and ethnic nomenclature. Although there are advocates and adversaries to the role of race and ethnicity in the literature, we believe studies like ours will help to clarify the role of race and ethnicity in the epidemiology of skin disease. We agree that classification of racial and ethnic categories is difficult and wrought with ambiguity and inconsistency; however, we believe our study helps elucidate racial/ethnic differences in the common skin disorders for which individuals seek the care of a dermatologist.

Conclusion

Differences between black and white patients were observed when comparing the most common dermatologic disorders treated at a hospital-based dermatology practice. Despite our study's limitations, we believe our data may be helpful in identifying the specific dermatologic needs of a growing segment of the US population. Larger population-based studies are necessary to investigate racial and ethnic differences in the epidemiology of skin disorders. As populations with skin of color continue to grow,[22] it is essential that our knowledge of their disease processes grows accordingly. This knowledge, in turn, can help guide research and education to better serve the increasingly diverse US population.

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