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Dermatological Concerns in the Latino Population

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Dermatological Concerns in the Latino Population

INTRODUCTION

ORIGINAL ARTICLES

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Dermatological Concerns in the Latino Population

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The Latino, or Hispanics in the United States, are the drivers behind demographic growth. They are heterogeneous in many dimensions related to health risks and dermatological conditions. Understanding the heterogeneity and clinical manifestation of skin concerns in such population is essential for health care providers.

At the annual meeting of the American Academy of Dermatology in 2018, I chaired a special symposium titled "Skin Issues in Latino Patients", with the objective of training clinical practitioners how to better provide care and education to our diverse patients. A group of faculty came together to share their expertise in managing common dermatological concerns in Latino patients. Together, we outlined the leading research regarding Latino skin including examination, classification, diagnosis, and intervention regimens. This forum covered a thorough review on current treatment guidelines for skin cancers, hyper- and hypo-pigmentation disorders, photoaging, acne and rosacea, as well as cosmetic procedures. The faculty also advocated for education among Latino patients and health care providers to adapt good photoprotection practice and perform diligent skin cancer screening.

I would like to thank L'Oreal Research & Innovation and the *Journal of Drugs in Dermatology* for their support in publishing this special supplement, allowing us to present the AAD lectures to a broader audience.

Hyperpigmentation Disorders in Hispanic Population in the United States

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ABSTRACT

The Hispanic population is the third largest growing group in the United States and is projected to increase to 119 million by 2060. Skin of color populations including Hispanics are more susceptible to a variety of pigmentary disorders including melasma and post-inflammatory hyperpigmentation (PIH). Most previous treatment options for these disorders remain unsatisfactory. Current treatment options include topical therapies using skin lightening/bleaching agents, chemical peels, and physical therapies such as microdermabrasion, microneedling, radiofrequency, and lasers. Combination therapies using skin lighting agents, peels, and physical means are also commonly used. New trends include protection and prevention using sunscreens, physical blockers, and the use of new and effective anti-oxidants and anti-inflammatory agents. The choice of therapeutic agents involves assessment of the risk-benefit profile of each individual. As the pathophysiology of melasma and PIH are being intensely investigated and studied, the treatment options are also expanding. In this review, the current therapeutic options are summarized and new and emerging treatment options for PIH and melasma are discussed.

J Drugs Dermatol. 2019;18(3 Suppl):s112-114.

INTRODUCTION

The United States is rapidly becoming a country where the majority of citizens will no longer have white skin but pigmented skin. As of July 2016, Hispanic and Latino Americans amount to an estimated 17.8% of the total US population, making up the largest ethnic minority.[1] People with skin of color (Fitzpatrick phototypes III, IV, V, and VI) constitute a wide range of ethnic groups: African Americans, Asians, Hispanics/Latinos, Native Americans and Pacific Islanders, as well as those who have intermarried. Of this, the Hispanic population is the third largest growing population in the US and is projected to increase from 55 million in 2014 to 119 million in 2060.[1]

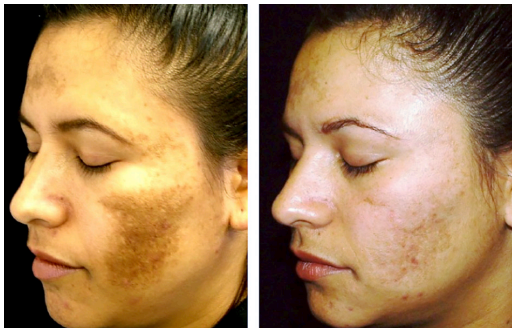
Darker skin tones are more susceptible to a variety of skin color disorders including post-inflammatory hyperpigmentation, melasma, solar lentigines, photodamage, and erythema dyschromicum perstans. It is estimated that the pigmented lesions and hyperpigmentary disorders are more common in people of skin of color, especially in Hispanic population (14.2%).[2] This is a result of the difference in the melanocyte biology of people with skin of color. They have highly melanized melanosomes, increased melanin content, and greater melanogenic capacity in response to skin damage and UV irradiation.[3]

Melasma is the most common hyperpigmentary disorder in Hispanic subjects. The impact on the quality of life of affected individuals is well documented, demanding new therapeutic strategies. However, the treatment of melasma remains highly challenging. Melasma is more prevalent in females, therefore it is often considered as the main consequence of female hormone stimulation on a predisposed genetic background. The involvement of genetic factors in the etiology of melasma is well documented. Up/down regulation of approximately 279 genes, increased expression of a subset of Wnt pathway modulator genes, and upregulation of fatty acid and prostaglandin metabolizing enzymes have been demonstrated.[4] Ultra violet radiation (both UVB 290-315 and UVA 315-400nm) and even visible light (400-700) are implicated in stimulating melanogenesis in skin of color population.[5] An additional factor in melasma pathogenesis include increased vascularization of both the number and size of dermal blood vessels in lesional skin and an increase of vascular endothelial growth factor (VEGF) levels in lesional skin.[6]

All the current treatment options for melasma remain unsatisfactory. A literature search on therapeutic options for melasma reveal over 40 studies, many of them using different modalities including topical depigmenting agents, chemical peels, lasers, and light therapies. Topical depigmenting agents were found to be the most effective for moderate to severe melasma; combination therapies rendered the best results, however, caused erythema and other side effects in almost 40% of the subjects, including skin irritation and subsequent hyperpigmentation, especially in dark skinned individuals.[7,8]

Topical therapies using skin lightening/bleaching agents have been successfully used to treat melasma. Bleaching agents can have different mode of actions.[9] These include: down regulation of tyrosinase, the key enzyme in synthesis of melanin (eg,

FIGURE 1. Glycolic acid peel + triple combination treatment (hydroquinone/tretinoin/fluocinolone) for melasma.



Baseline

After 2 peels and 4 weeks of triple combination

retinoids) tyrosinase inhibition (eg, hydroquinone, resorcinol, arbutin, kojic acid, vitamin C, resveratrol, ellagic acid), inhibition of tyrosinase glycosylation (eg, glucosamine, N-acetyl glycosamine), inhibition of melanosome transfer to keratinocytes (niacinamide, protease inhibitors, soy extract), inhibition of inflammation (steroids, glycyrrhetinic acid), or increased epidermal turnover (retinoids, alpha and beta hydroxy acids). Combinations of the different classes of topical agents provide additive and synergistic benefits for melasma subjects. Hydroquinone is the best studied and most frequently used topical depigmenting agent. However, its side effects include irritation, allergic contact dermatitis, and rarely, ochronosis. A triple combination cream of HQ 4%, Tri-Luma®; fluocinolone acetonide 0.01%, HQ 4%, tretinoin 0.05% has been shown to be very effective in treating melasma and PIH.[10] Another study of triple combination cream (-hydroquinone 2%/tretinoin 0.05%/fluocinolone 0.01%) vs glycolic acid/azelaic acid 20% demonstrated a significant reduction of melasma scores in both the groups.[11]

Chemical peeling is a popular, relatively inexpensive, and generally safe method to rejuvenate skin and reduce the appearance of melasma. Superficial peels can be used to enhance treatment within a variety of conditions, including acne, melasma, dyschromias, photodamage, and actinic keratosis. Successful outcomes are based on a thorough understanding and application of correct chemical peel procedures, including history-taking, pretreatment, preparation, peel selection, patient communication, and maintenance regimens.[12] A variety of chemical peel options are available for the clinician. Among those, most commonly used are glycolic acid (20-70%), salicylic acid (20-30%), Trichloroacetic acid (TCA) (15-35%), or combinations of peels (Jessner's solution hydroquinone+ kojic acid), glycolic + TCA, glycolic + Azelaic acid, etc. The amount and combination can be varied depending on the severity of melasma and the depth of penetration to be achieved. A list of peeling agents used for superficial, medium, and deep peeling for melasma subjects is shown in Table 1. Dozens of comparative studies and clinical outcome with chemical peels for

TABLE 1.

Chemical Peeling Agents Used for Treatment of Melasma		
Superficial	**Medium**	**Deep**
• AHA's (Glycolic and Lactic) • Salicylic Acid • Resorcinol • Jessner's (Salicylic Acid + Lactic Acid + Resorcinol) • TCA 10-25% • Pyruvic Acid • Phytic Acid • Amino Fruit Acid	• TCA 35-50% • Combination: CO2, Glycolic, Jessner's	• Phenol • TCA>50%

melasma in dark skin subjects have been carried out and summarized.[13] Moderate to severe melasma has been successfully treated using a triple combination cream in combination with glycolic acid peels (Figure 1).[14] 1% tretinoin has also been used successfully as a peeling agent and has been shown to be less irritating than 70% glycolic acid in a clinical study.[15] Newer peeling agents such as other fruit acids, phytic acid, and pyruvic acid are also used in reducing melasma severity. As mentioned above, selection of peeling agent is carefully controlled based on the subject's skin type to reduce the side effects such as irritation and PIH.

Other more recent developments in melasma treatments include: microdermabrasion, micro needling, radiofrequency treatments, and lasers.[16,17,18] A variety of lasers have been used for the treatment of melasma. The lasers help in the disruption of the melanin granules within the skin, thereby reducing the pigmentation intensity. The most commonly used lasers are Q-switched alexandrite, carbon dioxide, erbium, ruby Q-switched, 510nm pigmented dye and Nd:YAG lasers.[19] Other recently developed laser/light therapy options include intense pulse light therapy to treat refractory melasma in Asian populations.[20] Laser and light therapy can be used alone or in combination with topical creams such as triple cream or even peels.[21,22] As with peels, laser and light therapies carry the risk of hyperpigmentation, hypopigmentation, depigmentation, scars, worsening of melasma, and/or post inflammatory hyperpigmentation. Subject selection and type/intensity of laser has to be carefully controlled to avoid such side effects.

Post-inflammatory hyperpigmentation (PIH) is another common occurrence in people with skin of color. PIH is defined as the appearance of excessive pigmentation in skin surface in response to acute or chronic inflammatory process. The distribution of pigmentation is in the same area of inflammation. The exact mechanism of PIH is not fully understood, however, the primary inflammatory response involves release of mediators such as prostaglandins (primarily PGE2), thromboxanes, and leukotrienes that then activate local melanocytes to produce more melanin.[17] Risk factors for PIH include skin type III-VI, skin inflammatory diseases such as acne, psoriasis, ec-

TABLE 2.

Diagnosis of PIH vs Melasma	
PIH	Melasma
Spontaneous resolution	Prolonged duration
Any location	Primarily face
Any site	Sun-exposed sites
Equal sex predisposition	Female predominance
Prevention possible	Prevention difficult
More dermal melanophages	Fewer dermal melanophages

zema, allergic contact dermatitis, and lichen planus, reaction to cosmetic or perfume products, or cosmetic procedures such as peels lasers waxing, electrolysis, and local trauma including insect bites. The main differences between PIH and melasma are shown in Table 2.

Treatment options for PIH all involve treatment of the underlying condition as well as preventing further melanocyte activation. The success of treatment depends on how deep the melanin deposits have occurred (epidermis vs dermis) and how long the PIH has been present, and the primary underlying cause or condition. The therapeutic options are same as for melasma, topical treatments and/or combined with physical treatments such as peels and lasers. Triple combination therapy has been successfully used for PIH. Preventative measures such as protection of area from sun using sunscreens and clothing is recommended. Combination therapies include chemical peels (salicylic + glycolic), Jessner's solution, microdermabrasion, lasers, and pulse light therapy. Combination therapies appear to provide better results for post-operative and other types of PIH.

CONCLUSION

In summary, both melasma and PIH are the most common pigmentary disorders present in people of skin of color, including the Hispanic population in the US. In addition to the therapeutic options discussed above, several new approaches are being used in recent years. Protection from UV using broad spectrum sunscreen and topical antioxidant agents such as vitamin C or other antioxidant natural agents such as green tea extract, beta carotene, fish oil, etc., are being used. New therapeutic trends include protection and prevention using sunscreens, physical blockers, new and effective anti-oxidants and anti-inflammatory agents, and effective patient counseling. It is essential that therapy for pigmentary disorders must be disease specific and individualized. The choice of therapeutic agents involves assessment of the risk-benefit profile of each individual. As the pathophysiology of melasma and PIH are being intensely investigated and studied, the treatment options are also expanding.

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Disorders of Hypopigmentation

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ABSTRACT

Hypopigmentation and depigmentation of the skin can be due to multiple causes and has a broad differential diagnosis. The most common cause of depigmentation worldwide is vitiligo. This disorder affects 1-2% of the world's population and is seen in all races. Vitiligo is an autoimmune disorder in which the predominant cause is an attack by CD8+ cytotoxic T cells on melanocytes in the epidermis. This condition can have a significant negative impact on the quality of life of affected individuals. Treatment options currently include psychological counseling, topical therapy, systemic therapy, phototherapy, surgical therapy, and depigmentation. In patients with stable, refractory disease, successful repigmentation has been achieved using mini-punch grafting, blister grafting, and non-cultured epidermal suspension (NCES) grafting. Emerging therapies include the Janus kinase (JAK) inhibitors ruxolitinib and tofacitinib. Further studies exploring the pathogenesis of vitiligo are warranted in order to optimize treatment for affected patients.

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INTRODUCTION

Hypopigmentation and depigmentation of the skin can be caused by multiple disorders. These include seborrheic dermatitis, mycosis fungoides, tinea versicolor, pityriasis alba, nevus depigmentosus, leprosy, and vitiligo (Figure 1).[1,2] The most common cause of depigmentation worldwide is vitiligo. This disorder affects 1-2% of the world's population and can be seen in all races.[3] Vitiligo can have a significant impact on the quality of life of affected individuals.[4] Although the disease course is often unpredictable, a few clinical signs that indicate increased disease activity have been identified. Confetti-like lesions, trichome lesions, and evidence of the Koebner phenomenon all indicate the need for immediate treatment (Figure 2).[5,6]

Vitiligo is caused by a disorder in the immune system in which CD8+ cytotoxic T cells attack melanocytes in the epidermis causing apoptosis and subsequent depigmentation.[3] Although there are no current biomarkers to measure activity of vitiligo, certain clinical findings have a bearing on prognosis and likelihood of repigmentation. Patients who tend to respond well to treatment include younger patients, darker skin types, a short history of disease (<2 years), and those with depigmentation of the face, ears, neck, axillae, and other hair bearing areas with pigmented hairs. Features that characterize a poor prognosis include older patients, lighter skin types, long history of disease or rapidly spreading disease, and involvement of the scalp, lips, hands, elbows, genitalia, feet, or knees. Additionally, evidence of leukotrichia within depigmented lesions is a sign of poor prognosis (Figure 3).

Treatment options for vitiligo include psychological counseling, topical therapy, systemic therapy, phototherapy, surgical therapy, and depigmentation.[7] The current mainstay of treatment is phototherapy although treatment courses are often prolonged, lasting 6-18 months.[7] Narrow band-UVB, PUVA, PUVASOL, UVA, sunlight, and solarium therapy can all be utilized based on treatment availability. However, the most successful phototherapy type remains NBUVB, which is effective due to its immunosuppressive effects and ability to induce melanocyte differentiation and melanin production.[7,8] Studies have shown that home phototherapy is more efficient and cost effective than in-office phototherapy.[9] In patients with the signs of active disease discussed above, a short course of an oral corticosteroid, such as dexamethasone, may be warranted.[7,10] Due to their

FIGURE 1. Visual differential diagnosis of hypopigmentation. Included in the differential diagnosis of hypopigmented and depigmented lesions are hypopigmented mycosis fungoides **(A)**, vitiligo **(B)**, tinea versicolor **(C)**, and nevus depigmentosus **(D)**. Other items on the differential diagnosis, but not included in this image, include seborrheic dermatitis, pityriasis alba, and leprosy.

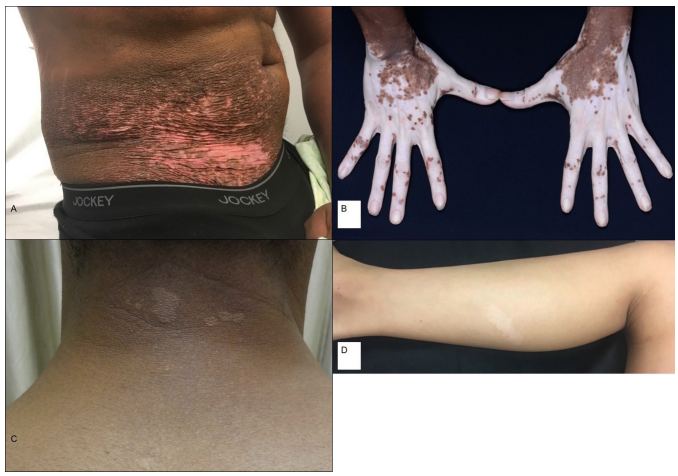
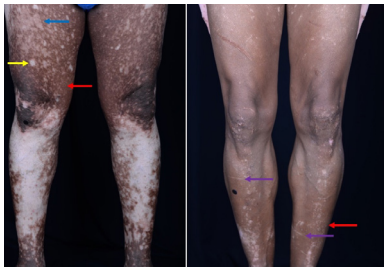


FIGURE 2. Signs of activity in vitiligo: confetti, trichome and Koebner phenomenon. Common signs of activity in vitiligo include trichrome (blue arrow) and confetti-like (red arrows) depigmentation as well as Koebner phenomenon (purple arrow). An example of a vitiligo lesion, for comparison, is indicated by the yellow arrow.



antioxidant properties, vitamins C, E, and alpha lipoic acid may also be useful in reducing triggering factors that lead to depigmentation when used in combination with topical and systemic treatments as well as phototherapy.[11]

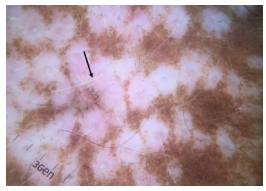
Emerging therapies for vitiligo include topical and oral Janus kinase (JAK) inhibitors. Topical ruxolitinib and oral tofacitinib have both been found to be potentially effective in achieving repigmentation in small pilot studies.[12,13] These medications interrupt IFNγ signaling via the JAK STAT pathway, which is crucial in the pathogenesis of vitiligo.[13] Other potential therapeutic targets include IFNγ, CXCL9/10, and CXCR3.[3,13]

In patients with resistant depigmentation that has been stable for 6 months to 2 years, surgical therapy may be considered.[7] Mini-punch grafting, blister grafting, and non-cultured epidermal graft suspension (NCES) are all viable options for patients.[7] The choice of procedure is dependent on the body area involved, surface area of depigmentation, and affordability. NCES has been proven to be most efficacious, however mini-punch and blister grafting techniques are less expensive and easier for practitioners to master.[7] In patients with widespread vitiligo (>50% body surface area involvement) that is refractory to therapy, depigmentation of the remaining pigmented areas with monobenzylether of hydroquinone may be considered.[7] Patients should be educated that this process is irreversible and be comfortable with the permanent nature of this treatment prior to initiation.[7]

CONCLUSION

In summary, vitiligo is a common autoimmune disorder that causes depigmentation and significantly impacts the quality of life of affected individuals.[3,4] A careful history and physical examination should be performed in order to differentiate vitiligo from other conditions that may cause hypopigmentation or depigmentation. Physicians should be wary of signs of activity that mandate prompt treatment.[5,6] Current mainstays of treatment include topical corticosteroids and phototherapy.[7] Emerging therapies that may be life changing for patients with refractory disease include the JAK inhibitors ruxolitinib and tofacitinib as well as new JAK inhibitors that are being studied. Further studies exploring the pathogenesis of vitiligo are warranted in order to optimize treatment options for patients.

FIGURE 3. Leukotrichia in vitiligo. Leukotrichia (black arrow) as seen on dermoscopy. In patients with vitiligo, leukotrichia within depigmented lesions is a sign of poor prognosis.



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Skin Cancer in Hispanics in the United States

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ABSTRACT

The Hispanic population has been the principal driver of U.S. demographic growth in the last two decades. In 2016, Hispanics accounted for 18% of the nation's population and were the second-largest racial or ethnic group behind whites making the people of Hispanic origin the nation's largest ethnic or racial minority. Non-melanoma skin cancer (NMSC) is the most common malignancy in the U.S. with over 3.5 million diagnosed in over 2 million people, incidence rising at about 2.6% per year. In Hispanics, Loh et al showed a retrospective 5-year one-institution study that revealed an incidence of 3% for NMSC, in a population that is younger and mainly females as compared to Caucasian and Asians. In the past two decades, melanomas incidence among Hispanics has risen by 20%. Hispanics are younger at diagnosis, present with thicker tumors (>1mm, 35% to 25%), regional involvement (12 to 8%), and distant metastasis (7 to 4%), having the worst survival rate as compared to whites. In general, even though increasing, the incidence of NMSC and MM is lower in Hispanics than Caucasians, however, the mortality is higher. The later stage at diagnosis and worse prognosis in Hispanics have been attributed to several factors: 1.) Less awareness of risks or symptoms leading to a lack of linguistically or culturally targeted screening efforts.[20] 2.) Decline in sun-safe behaviors because of increasing acculturation.[21, 22] 3.) Less access to health insurance-- more than 15% Hispanics in last census lack medical coverage causing delays in seeking treatment.[23] Many of these factors may be associated with lower socioeconomic status (SES). For cancer control efforts to succeed, we must better understand the major causes of advanced presentation of melanoma in Hispanics (Hispanics and Latinos) who represent the most rapidly expanding demographic segment in the U.S. Increased awareness of skin cancer and ways to prevent it on the part of providers and patients has the potential to decrease incidence, increase early diagnosis, and improve outcomes among Hispanics. Primary care physicians and dermatologists can dispel the myth that melanoma only affects NHWs and educate Hispanic patients in a culturally appropriate manner on melanoma risk factors, how to recognize sunburn, how to identify abnormal lesions, and the need to check non-sun-exposed areas for ALMs that are comparatively more common among Hispanics than among NHWs.

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INTRODUCTION

The Hispanic population in the United States has reached nearly 58 million in 2016 and has been the principal driver of U.S. demographic growth, accounting for half of national population growth since 2000. In 2016, Hispanics accounted for 18% of the nation's population and were the second-largest racial or ethnic group behind whites making the people of Hispanic origin the nation's largest ethnic or racial minority.[1]

The projected Hispanic population of the United States is 119 million by 2060. According to this projection, the Hispanic population will constitute 28.6 percent of the nation's population by that date.[2]

Hispanics are the youngest major racial or ethnic group in the United States. About one-third, or 17.9 million, of the nation's Hispanic population is younger than 18, and about a quarter, or 14.6 million, of all Hispanics are Millennials (ages 18 to 33 in 2014), according to a Pew Research Center analysis of U.S. Census Bureau data. The Hispanic population within the United States is younger than the Caucasian population. Fifty-seven percent of Hispanic married-couple households had children younger than 18 present in 2014, whereas for the nation it was 40.1 percent.[3] This population is made of 64% born within the U.S. and 36% immigrants.[1] Hispanics of Mexican origin account for 63.3% (36 million) of the nation's Hispanic population in 2015, by far the largest share of any origin group, but down from a recent peak of 65.7% in 2008. Another 9.5% were of Puerto Rican background, 3.7% Cuban, 3.7% Salvadoran, 3.3% Dominican, and 2.4% Guatemalan.[4] The five states that have the largest concentration of Hispanics are California, Texas, Florida, New York, and Illinois. Nearly half of all Hispanics live in California and Texas. Fifteen million live in California, 10.4 million in Texas, 4.2 million in Florida, 3.4 million in NY, and 2 million in Illinois.[5]

Skin Cancer in Hispanics

The American Cancer Society reported that Cancer remains leading cause of death in Hispanics.[6] Lung cancer for men and breast for women. Non-melanoma skin cancer (NMSC) is the most common malignancy in the United States, over 3.5 million in over 2 million people, incidence rising at about 2.6% per year.[7] In Hispanics, Loh et al showed a retrospective 5-year one-institution study that revealed an incidence of 3% for NMSC, in a population that is younger and mainly females as compared to Caucasian and Asians.[8]

Ultraviolet radiation is the single most common cause of skin cancer including NMSC and malignant melanomas (MM).[9] UVA and UVB cause DNA mutations -thymidine dimers - that are the footprint for most skin cancers.[10] Chronic sun exposure is associate with NMSC and acute or seasonal sun exposure with MM in Caucasians and is undetermined in darker skin.[11] Reported risk factors for MM in darker skin patients include albinism, radiation therapy, trauma, immunosuppression, and preexisting moles.[11] Tanning bed users increase their melanoma risk by 15% as compared to non-users, while doubling their risk for SCC.[12,13]

Basal cell carcinoma (BCC) is the most common skin cancer in Caucasians, Hispanics, Chinese Asians, and Japanese, estimated at 3.5 million diagnosed annually.[14] And, it is the second most common in African Americans and Asian Indians. The incidence is 1/100,000 in African Americans, 6 in Chinese, 15-17 in Japanese, 50-171 in Hispanics, and 185-340 in Caucasians. Thirty-six percent arise in an actinic keratosis.[14,15] There is a significantly increased incidence in Hispanics in New Mexico.

Squamous Cell Carcinoma (SCC) is the most common cutaneous malignancy in African Americans and Asian Indians. It is the second most common skin malignancy in Caucasians, Hispanics, Chinese Asians, and Japanese; and most nations around the world. The incidence is 17-360/100,000 in Caucasians, 14-33 in Hispanics, 3 in African Americans and Chinese Asians, and tends to be more aggressive in African Americans in non-sun exposed areas of chronic inflammation or scarring with a 20-40% risk of metastasis. Sixty-five percent will arise in an actinic keratosis.[15]

Malignant melanoma (MM)is the sixth most common cancer in U.S. and the most common skin cancer among 25-29 years old and second most common among 15-29 years old. Melanoma incidence rates in the U.S. are lower among Hispanics (4.5 per 100,000) than among NHWs (21.6 per 100,000), 0.5-1.5 for Asians and African Americans. However, early stage diagnosis is less among African Americans (48%) and Hispanics (74%) than among Caucasians (91%).[15,16] The most common type in Hispanics and Caucasians is superficial spreading melanoma; acral lentiginous melanomas (ALM) is the most common for African Americans and Japanese.[11-16]

In the past two decades, melanomas incidence among Hispanics has risen by 20%. Hispanics are younger at diagnosis, present with thicker tumors (>1mm, 35% to 25%), regional involvement (12 to 8%), and distant metastasis (7 to 4%), having the worst survival rate as compared to whites.[17-19] A cross-sectional and retrospective analysis of melanoma cases, with known stage and ethnicity reported from 1990-2004, was done to evaluate any disparity in melanoma incidence among different ethnicities. All cases were obtained from Florida cancer data system.[18] There were 41,072 cases identified. The incidence of MM was found increased in white non-Hispanic women (3%) and men (3.6%), respectively, and white Hispanic women (3.4%).[18] However, the most concerning finding was that regional and distant metastasis were documented in 12% of Caucasians as compared to 18% of Hispanics. Another study compared the incidence of MM in people of color in Florida with incidence of MM in the rest of the U.S. The incidence of MM was found to be 20% higher in Hispanic males as compared to their male counterparts in other regions of the U.S.[19]

In general, even though increasing, the incidence of NMSC and MM is lower in Hispanics than Caucasians, however, the mortality is higher. The later stage at diagnosis and worse prognosis in Hispanics have been attributed to several factors: 1.) Less awareness of risks or symptoms leading to a lack of linguistically or culturally targeted screening efforts.[20] 2.) Declines in sun-safe behaviors because of increasing acculturation.[21, 22] 3.) Less access to health insurance– more than 15% Hispanics in last census lack medical coverage causing delays in seeking treatment.[23] Many of these factors may be associated with lower socioeconomic status (SES).[24]

A survey concerning weekly sun exposure and sun-protective behavior was conducted in a city clinic that services AA, Hispanics and Asians. A hundred patients were asked about sun exposure practices, evidence of sunburn, self-examination and awareness of skin cancer potential. Although 43% reported their ability to sunburn, less than 35% perceived some risk of developing skin cancer.[20] A large subset of Hispanics in these group perceived that despite sun burning they were not at risk for skin cancer. Multivariate analysis of race and ethnicity and awareness of skin cancer potential had reveal that Hispanics rarely perform self-skin exams, rarely go to the doctor for skin exams, that despite knowing that skin cancer can happen in skin of color, they do not perceive that they are at risk and only half of the Hispanics surveyed apply sunblock regularly as compared to 96% of Caucasians.[21] Three-hundred and sixty-nine high school students were surveyed in Florida, 148 white non-Hispanics and 221 white Hispanics, for behavior under the sun. These two populations with comparable skin phototypes and thus comparable risk of cutaneous malignancy, had totally different perceptions of skin cancer risk. Less than 40% of the Hispanics were aware of self-skin exams, were less aware of protective clothing, sunblock protection, were 2.5x more likely to have used tanning beds in the last year and were tanned. More than 43% of Hispanics never or rarely use sunscreens. Only a third of children with ethnic skin use sunscreen.[20-22]

Previous research by the U.S. Centers for Disease Control and Prevention has shown that Hispanics are twice as likely as non-Hispanic blacks and three times as likely as non-Hispanic whites to lack a regular health care provider.[23] The Pew Hispanic Center/Robert Wood Johnson Foundation Latino Health

survey of 4,013 Hispanic adults explores not only their access to health care, but also their sources of health information and their knowledge about a key disease (diabetes) at greater depth and breadth than any national survey done to date by other research organizations or the federal government. It finds that among Hispanic adults, the groups least likely to have a usual health care provider are men, the young, the less educated, and those with no health insurance. A similar demographic pattern applies to the non-Hispanic adult population. The new survey also finds that foreign-born and less-assimilated Latinos—those who mainly speak Spanish, who lack U.S. citizenship, or who have been in the U.S. for a short time—are less likely than other Latinos to report that they have a usual place to go for medical treatment or advice.[23]

To clarify the impact of race and ethnicity on late-stage melanoma diagnosis, a spatial analysis of geocoded melanoma cases diagnosed in Florida, 1999–2008 was done to identify geographic clusters of higher-than-expected incidence of late-stage melanoma and developed predictive models for melanoma cases in high-risk neighborhoods accounting for area-based poverty, race/ethnicity, patient insurance status, age, and gender. In the adjusted model, Hispanic ethnicity and census tract-level poverty are the strongest predictors for clustering of late-stage melanoma. Hispanic whites were 43% more likely to live in neighborhoods with excessive late-stage melanoma (P<0.001) compared with non-Hispanic whites (NHW). For every 1% increase in population living in poverty, there is a 2% increase in late-stage melanoma clustering (P<0.001). Census tract-level poverty predicted late-stage melanoma similarly among NHW and Hispanic whites. The impact of insurance coverage varied among populations; the most consistent trend was that Medicaid coverage is associated with higher odds for late-stage melanoma. The finding that Hispanics are most likely to reside in high-risk neighborhoods, independent of poverty and insurance status, underscores the importance of addressing, and overcoming community-level barriers to melanoma care.[24]

The largest analysis of melanoma incidence in U.S. Hispanics to date, observed that the distribution and overall burden of cutaneous melanoma, and particularly the associations between SES and melanoma incidence and thickness, differed substantially between Hispanic Californians and NHW Californians.

It was observed a much stronger burden of disease among lower SES Hispanics than among NHWs, particularly for men. The association between low SES and higher risk of thicker tumors at diagnosis was also much stronger among Hispanic men.[25] Melanomas in low-SES Hispanics were more than twice as likely to be >2mm thick than those in high-SES Hispanics.

Melanoma histologic subtype differed strongly by SES among Hispanic men, with less SSM and more NM (the subtype accounting for thicker melanomas) in lower SES Hispanic men. It was observed that roughly 66% the melanoma burden among Hispanic men occurred among those in the middle SES and low SES groups. By contrast, >60% of melanomas among NHWs occurred among those in the high SES group.[25, 26]

RESULTS

These results suggest that lower-SES Hispanics may have poorer access to social, cultural, educational or job-related benefits which increases the physician delay in melanoma diagnosis compared with their lower-SES NHW counterparts. Differences between lower- and higher-SES Hispanics are likely to be complex and may involve language barriers, knowledge about and access to health institutions, and/or other difficult-to-measure components of social capital. Sun-related behaviors and cultural norms may also differentially impact melanoma risk and detection among lower-SES Hispanics.

CONCLUSIONS

For cancer control efforts to succeed, we must better understand the major causes of advanced presentation of melanoma in Hispanics (Hispanics and Latinos) who represent the most rapidly expanding demographic segment in the U.S. Increased awareness of skin cancer and ways to prevent it on the part of providers and patients has the potential to decrease incidence, increase early diagnosis, and improve outcomes among Hispanics.[15] Current recommendations for behavioral counseling by health care providers on skin cancer prevention only include fair-skinned youth ages 10–24.[27] Although this recommendation is based on skin tone and not race, some providers may not consider Hispanics fair-skinned despite their actual skin tone[15] and miss an appropriate opportunity to educate young patients. Hispanics may be more likely to believe that there is little they can do to prevent skin cancer, to believe their risk is below average compared with others of similar age, and to report they are unsure about which prevention recommendations to follow.[28-30] Primary care physicians and dermatologists can dispel the myth that melanoma only affects NHWs, and educate Hispanic patients in a culturally appropriate manner on melanoma risk factors, how to recognize sunburn, how to identify abnormal lesions, and the need to check non sun-exposed areas for ALMs that are comparatively more common among Hispanics than among NHWs.[31-32]

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Photoaging and Photoprotection in United States Hispanic Population

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ABSTRACT

Photoaging is a complex and chronic process that induces structural and functional changes in sun-exposed skin, including coarse wrinkles, laxity, dyschromia, telangiectasias, and potential precancerous lesions. Pigmented skin presents different structure and physiology that contribute to distinctive photoaging process. The skin of color population is reported to "age better" than their Caucasian counterparts in general, with fewer wrinkles and better skin texture. However, pigmentary disorders and sun-exposure related dyschromia are highly prevalent in skin of color. Hispanics are the fastest growing population in the U.S. and represents a heterogenous group of people with different skin tones and Fitzpatrick phototypes. They demonstrate large diversity and heterogeneity in skin physiology, pigmentary disorders, and photoaging-related skin color shifting. Specific concerns around hyperpigmentation, skin tone evenness, and texture or roughness are very common among Hispanics, demanding targeted medical and cosmeceutical solutions. Customized daily routines including sufficient photo-protection are essential to address such needs. This mini review identifies some of the specific skin concerns of Hispanics in America and emphasizes the needs for long-term sunscreen use and education.

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INTRODUCTION

Ultraviolet (UV) irradiation of the skin leads to acute inflammatory reactions such as erythema, sunburn, and chronic reactions, including premature skin aging and skin tumors. Photoaging is a complex and chronic process that induces structural and functional changes in sun-exposed skin, including coarse wrinkles, laxity, dyschromia, telangiectasias, and potential precancerous lesions. UV irradiation (both UVB and UVA) is a potent generator of oxidative stress in the skin, increasing the cellular levels of reactive oxygen species, which damages lipids, proteins, and nucleic acids in both epidermal and dermal cells, and contributes to the sunburn reaction as well as photo carcinogenesis and photoaging.[1]

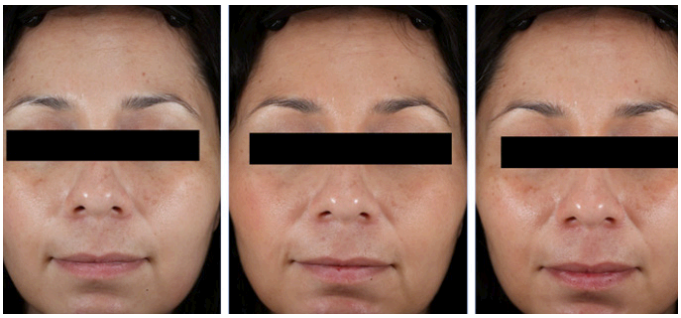
All skin types do not react to UV irradiation in the same way. Pigmented skin (Fitzpatrick skin type III-IV) presents different structure and physiology that contribute to distinctive photoaging process. The increased amount of melanin in pigmented skin provides some protection from photodamage and photoaging among skin or color populations and lowers the risk of skin cancer. Skin of color subjects generally have fewer visible signs of aging (deep wrinkles, fine lines, rough surface texture, and sun spots). However, darker skin tones are more sensitive to UV, visible light, and infrared-induced skin pigmentation. Their skin is more susceptible to certain skin conditions including post-inflammatory hyperpigmentation (may occur after injury, burn, cut, etc.), melasma, pityriasis alba (round, light patches covered with fine scales), dry or "ashy" skin, dermatosis papulosa nigra, and at greater risk of keloid development.[2] The incidence of skin cancer among U.S. Hispanics has also increased 1.3 % annually from 1992 to 2008.

The Hispanic population is projected to be among the fastest growing population in the United States. They are projected to increase from 55 million in 2014 to 119 million in 2060, an increase of 115% and by 2060, 29% of the U.S. is projected to be Hispanic-- more than one-quarter of the total population.[3] Hispanic-Americans come from a wide range of geographical areas, which may differ in their specific cultural, ethnic, and national characteristics. The Hispanic group in the U.S. includes people with Puerto Rican, Dominican, Cuban, Venezuelan, Mexican, or other Latin American origins or mixed populations. This diversity may contribute to a wide range of skin complexions with different hues and undertones that make proper clinical skin assessment for photoaging or pathological conditions more complex.[4]

Clinical and Instrumental Assessment of Skin Color

When performing clinical evaluation of skin complexion or color shift under physiological or pathological conditions, multiple methodologies have been adopted to help define and track the progression. Traditional Fitzpatrick assessment of skin phototypes is important for understanding the photo-reactivity of skin, however, it does not correlate well with skin tone, especially when color shifts occur due to photo aging or diseased conditions. Vissher et al demonstrated the use of individual typology angle (ITA) values determined from L^* and b^* values, where 6 groups of skin pigmentation were classified: ITA greater than 55 (very light tone), 41 to 55 (light tone), 28 to 41 (intermediate tone), 10 to 28 (tan), -30 to 10 (brown), and less than-30 (dark tone).[5] The ITA values and categories correlated well with skin melanin content based on mexameter measure-

FIGURE 1. Aging pattern over 15 months in a Hispanic female.



Baseline 10 months 15 months

ment. De Rigal et al assessed the skin color of females globally, with an instrumental approach using the "chromosphere®" spectroscopy imaging system to capture skin color variation in details. This together with interviews led to the establishment of a color assessment chart of 66 shades that enabled clinicians and consumers to match skin tone and color variation precisely. In this manner, they were able to establish a veritable geography of consumer skin tone analysis in multiple ethnicities. Based on objective elements, this mapping makes it possible to adapt cosmeceutical products to the expectations of different consumers, and evaluate the effectiveness of skin care products that target radiance or uneven skin tone in different ethnic groups.

Due to the heterogeneity of Hispanic American population and the wide range of skin tones,[5,6] a combination strategy is required to define and evaluate color and pigmentation related concerns in this population. It is recommended that clinical researchers adopt a combination strategy using Fitzpatrick phototype, ITA values, and skin color charts,[5] to accurately represent the clinical manifestation of facial pigmentation and skin tone variation. By using such analysis in combination with self-assessment questionnaires, diversity of skin tone and color shift with photoaging in Hispanic group can be quantitated effectively.[5,6]

Pigmentation Changes Associated With Photoaging in Hispanics

During the photoaging process, it was reported that major concerns of Hispanic females were "yellow tone" and "dullness" of their skin. Other concerns include acne/breakouts, uneven skin tone, pigmentation spots and marks, undereye dark circles, and scarring. As with all other skin types, the ideal skin for Hispanic females is one that looks uniform in color, consistent and clear, without any blotchiness, marks, patches, dark circles, or age spots. Despite the concerns on the quality of their skin, the data from measurement of skin tone of Hispanic women showed a fairly good evenness among younger population.[4] A significant darkening of skin with age as well as skin heterogeneity was also observed for all 4 different skin types (Caucasian, Chinese, Hispanic, and Black), suggesting the damaging effects of photoaging.[6] Figure 1 illustrates the aging progression of a 40-year-old Hispanic female subject of skin type IV over a period of 15 months in Los Angeles area. The baseline picture taken during the winter month demonstrates fairer complexion with more uniform skin texture. The figure at 10 months and 15 months demonstrates increasing pigmentation, redness, unevenness of skin color, and beginning of the appearance of dark shades and patches.

Sun Protection in Hispanics

The majority of the U.S. Hispanic population resides in areas with high UV index, and sun seeking behaviour is very common. However, the vast majority of Hispanics do not meet sun protection recommendations.[7] Regardless of national origin, being born in the U.S. or based on the amount of time spent living in the U.S., Hispanics do not uniformly engaged in sun protection behaviors on a regular basis, and thus there is a need to raise awareness of skin cancer risks, preventive measures, and benefits of sunscreen and sun protection among Hispanics in general.[8]

The sun protection behaviors recommended to reduce skin cancer risk and premature aging are sunscreen use, shade seeking, and use of sun protective clothing that minimizes skin exposure to the sun. Many Hispanics do not engage in these behaviors on a routine basis.[8,9] Data from several studies indicate that a number of sociodemographic factors are associated with Hispanic individuals' engagement in sun protection behaviors.[8,9] For example, Hispanic adults report that they engage in sun protection more by staying in the shade (53.7%) than use of sunscreen (32.3%) or wearing sun protective clothes (18.1%). Not surprisingly, 36.7% of the subjects indicated that they never use sunscreen. With age, those aged 65 and over appear to have stronger preference for staying in the shade and use of protective clothing than younger Hispanics. However, those aged 65 and over tend to use sunscreen less than younger Hispanics. Education and language also plays a role in the preferred sun protection measures with college educated Hispanics and those that speak mostly or only English having a higher usage rate of sunscreen than those with some high school education and mostly or only Spanish speakers; inversely, those with some high school education or those who mostly or only speak Spanish report using shade more frequently than those with college education or those who mostly or only speak English.[10] In a separate study, facial use of sunscreen was higher in Hispanic women (36.3%) than Hispanic men (16.0%) and while the women's use of sunscreen in other photo-exposed areas is lower than on the face (25.7%), it is still higher than in males (11.9%).[11]

Other life style factors such as pollution, dietary influences, stress, and lack of sleep can also influence the skin quality of Hispanic subjects. All these factors point to a need for better

education on intervention approaches that can be incorporated into programs to promote sun protection and life style behaviors among Hispanic adults. This will require intervening at multiple levels of the healthcare system, including educating a wide array of healthcare providers about skin cancer prevention among Hispanics, facilitating identification of Hispanics at increased risk for skin cancer, and delivering appropriate prevention messages in the media and public health forums.[8,9] In a recent study, long term benefit (1-year) of a broad range (SPF 30 and PPD 20 for UVB and UVA protection) sunscreen cream on skin was observed among US Hispanic females. The results positively demonstrated statistically significant improvement in overall skin quality and hyperpigmentation (Grimes et al, manuscript submitted). Such studies can help educate and stress the importance of daily use of high-quality sunscreen to Hispanic patients and skin of color patients in general.

According to the American Academy of Dermatology, skin cancer in skin of color population is on the rise, and often result in high mortality rate, possibly due to diagnosis at a later stage. Taken together, sun protection should be made a higher priority for skin of color population including Hispanics who currently do not adopt proper sun protection routines.

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Acne and Rosacea: Special Considerations in the Treatment of Patients With Latin American Ancestry

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ABSTRACT

Acne is a common disease among patients with Latin American ancestry. Its presentation is very similar to that in all skin types, but nodulocystic acne is more frequent in patients with oily and darker skin than in white Caucasians.
Acne sequelae in patients with Latin American ancestry and with darker skin include postinflammatory hyperpigmentation (PIH) and atrophic and hypertrophic scars or keloids, with PIH being the most common complication affecting the quality of life of patients.
Lately, more attention has been paid to rosacea in patients with darker skin. It has been seen that some of the patients, especially women, diagnosed with adult acne and who did not respond to treatment, were actually patients with rosacea. It is important to recognize the clinical characteristics of this disease in patients with darker skin in whom erythema and telangiectasia are difficult to observe.
Here, we present the most relevant clinical characteristics of both diseases, as well as their treatment in patients with darker skin with Latin American ancestry.

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INTRODUCTION

Acne is a common disease among patients with Latin American ancestry. As in the white, Caucasian population, acne affects, to a greater or lesser degree, around 85% of young people between the ages of 12 and 24 years. In recent years, an increase in acne has been observed in individuals older than 25 years of age, especially in women (adult acne).[1]

In some scientific and non-scientific publications, it has been determined that Latin or Hispanic skin is that of olive, medium to dark brown color, which generally tans and that seldom burns, with dark eyes and hair. However, this description is not exact. Although, a good part of the population has yellowish skin and dark hair and eyes, there is a great variety of skin types in Latin Americans, ranging from white skin with light eyes and reddish hair, to very dark skin, black, going through different shades of pink, light brown, chestnut, yellowish, and others, resulting from different racial mixtures. We must bear in mind that in Latin America, miscegenation was not only of Europeans with natives, but with slaves from Africa and also Chinese and Japanese, especially in Brazil, Peru, and Mexico, which resulted in a kind of skin color that is difficult to classify.

The Color of the Skin in Latin America

As mentioned above, all skin colors are found in Latin America as a result of the different mixes that have existed throughout the ages. Before the conquest of America, there were natives of the continent. These were called indigenous, that is, they came from the Indies because Columbus and his companions thought they had arrived in the Indies. Later, it was learned that they were not in the Indies, but a new continent called America, in honor to Amerigo Vespucci. These Amerindians mixed with the white Europeans giving rise to the Mestizos. The Spaniards also brought slaves from Africa and they also mixed with whites giving rise to the Mulattos, and with indigenous people, giving rise to the Zambos.[2,3]

Nowadays, due to the easy ways to travel, communications, and globalization in general, it is harder for us to classify people by the color of their skin, since mixtures are much more frequent and of different origins. One way would be through a color palette as shown in Figure 1.

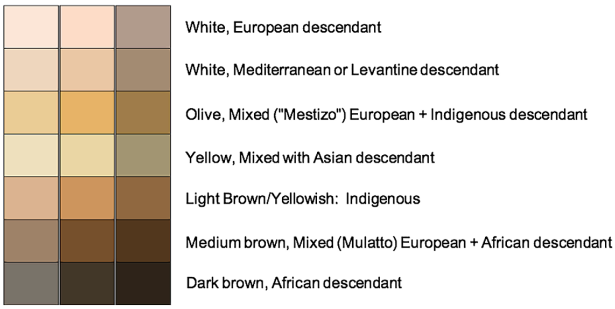
Acne: Clinical Considerations

All types of acne are seen in Latin Americans from the comedonal variant to the nodulocystic. This last form of acne has been observed more frequently in individuals with medium to dark brown skin than in lighter skin.[4]

From the beginning of the disease, even in cases with comedonal acne alone, a hyperpigmented halo is observed around the lesion, which could, in part, explain the post-inflammatory hyperpigmentation (PIH) that often emerges as an acne sequel. This is a very important characteristic that would denote the presence of inflammation and the indication for the early treatment of the disease.[5,6]

Topical Treatment

FIGURE 1. The colors of the skin in Latin America.



Retinoids are considered the first line of topical treatment. In patients with a tendency to PIH, low concentration retinoids should be used, in cream, at bedtime, starting only 2 to 3 times a week until the skin tolerates them well. This also decreases the associated iatrogenic PIH.[1,4-6]

Fixed combinations like benzoyl peroxide with adapalene or benzoyl peroxide with clindamycin are used to treat mild to moderated papulopustular acne and help preventing PIH.[1, 4-6]

Azelaic acid 20% in cream is effective in the treatment of acne in Latin America and helps prevent PIH. In the United States, it is not indicated for the treatment of acne. It would be used off-label.[1,4-6]

Oral Treatment

Oral antibiotics (eg, doxycycline): First line of treatment for moderate to severe acne (papulopustular, nodulocystic); Should be used at the same time with benzoyl peroxide to prevent bacterial resistance.

Oral Isotretinoin: For nodular-cystic or non-responsive to treatment acne. Should be started with low dose and increased progressively. Helps to prevent PIH.[1,4-6]

Hormonal therapy: For women; Oral contraceptives with antiandrogen properties (eg, Drospirenone or Norethindrone + ethinyl estradiol); Concomitant treatment for menstrual cycle-related inflammatory acne.

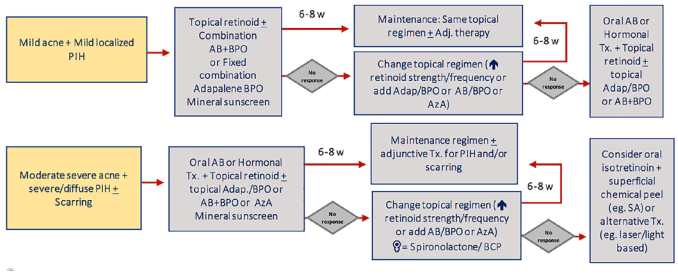
Spironolactone: For women with menstrual cycle-related inflammatory acne.[4-6]

Adjuvant Therapy

Skin care: Mild cleanser with or without salicylic acid and with ceramides, cholesterol, and fatty acids to improve the damaged skin barrier; Non-comedogenic moisturizers and daily, fluid, UVA-UVB, non-comedogenic sunscreen; Avoid scrubs, alcohol-based toners, and exfoliating cleanser to prevent irritation.

Chemical peels: Very superficial chemical peels with lactic acid, salicylic, or glycolic acid; Help to prevent and treat PIH; Preparation 2 to 3 weeks before the procedure with a combination of a bleaching agent like hydroquinone with retinoids and corticosteroids is mandatory.[1,6]

FIGURE 2. Management of acne and PIH.



PIH: Postinflammatory hyperpigmentation - AB: Antibiotic - BPO: Benzoyl peroxide
Aza: Azelaic acid - W: week - BCP: Birth control pill

Rosacea: Clinical Considerations

Rosacea is more frequent in patients with a background from the southern cone of South America (Argentina, Uruguay, Southern Brazil, Chile, and Paraguay) because their skin is lighter due to the presence of Italian and German immigrants after the first and second world wars. Although the disease is more common in phototype I and II (Fitzpatrick), it can also be suffered by people with darker skin color. It could be misdiagnosed with adult acne. To try to avoid this, we must consider rosacea in the differential diagnosis when we have a patient with darker skin, facial flushing, heat, eye symptoms, or papulopustular elements and absence of comedones.

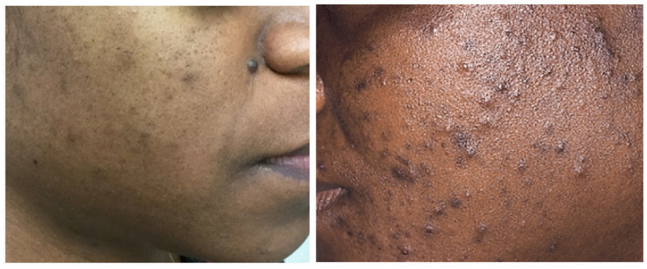
Four subtypes of rosacea can be diagnosed: Erythematotelangiectatic (ETR), papulopustular (PPR), glandular hyperplastic or phymatous rosacea (GH/FR), and ocular (OR). The granulomatous variant is more frequent in darker phototype skin.[7,8]

Unlike acne, postinflammatory hyperpigmentation is rare in patients with rosacea among patients with Latin American ancestry.[8,9.]

Treatment of Rosacea[10]

General Care: Avoid trigger factors; Use daily, continuous sun-protection.

FIGURE 3. Postinflammatory hyperpigmentation.



Dermocosmetic Care: Cosmeceuticals (cutaneous barrier restoring cleansers/moisturizers, antioxidants, niacinamide, colloidal oats, witch hazel, among others); Cold compresses; Thermal water.

Topical Treatment: Oxymetazoline or brimonidine are the first line of treatment for ETR in combination with azelaic acid, if some papules or pustules are present; Ivermectin, azelaic acid, or metronidazole are the first line of treatment for PPR associated or not with brimonidine or oxymetazoline; If patient does not tolerate this treatment well, it should be switched to pimecrolimus or tacrolimus; For ocular rosacea the best topical treatment is ophthalmic cyclosporine.

Systemic Treatment: The first line of treatment for PPR, in association with the topical treatment described above, is the use of modified release doxycycline: 40 mg (30 mg immediate release and 10 slow release). In patients which do not tolerate doxycycline, children or pregnant, macrolides (eg, clarithromycin) are the first choice. Patients with severe PPR, GH/PR or granulomatous rosacea, would benefit with the use of low dose of oral isotretinoin.

The first line of treatment for phymatous rosacea is the use of ablative laser therapy (eg, CO2 laser) followed by dermabrasion, electro/radiosurgery, and cryosurgery.

CONCLUSIONS

There is no such thing as Hispanic skin. The Hispanic skin can range from white to black with diverse variation in colors/shades as a result from the blend of different races/ethnicities. There is also a subclinical inflammatory process in patients with all skin colors even in cases of non-inflammatory acne that can result in PIH.

PIH affects quality of life. Early measures, such as daily use of sunscreens, proper makeup, and anti-inflammatory agents with bleaching effect, like azelaic acid, should be considered. Treatments that may irritate the skin should be avoided to decrease the risk of PIH

Although Rosacea is more frequent in phototype I and II (Fitzpatrick) it can also be suffered by people with darker skin color. We must consider rosacea in the differential diagnosis when we have a patient with dark skin, facial flushing, heat, eye symptoms, or papulopustular elements and absence of comedones, so as not to confuse the disease with adult acne, as may be happening in many of the cases not initially diagnosed as rosacea. Unlike acne, postinflammatory hyperpigmentation is rare in patients with rosacea.

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Cosmetic Laser Procedures in Latin Skin

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ABSTRACT

Hispanics/Latinos are one of the fastest growing segments in the skin of color population in the United States. Utilization of lasers especially in people with skin of color requires a thorough understanding of laser physics and laser tissue interactions. In this article, we will outline the different lasers used in our practice based on each chromophore. Pretreatment recommendations as well as management of complications will also be shortly discussed. Our goal is for the readers to grasp the importance of proper device selection, understand the concept of selective photothermolysis, and the various treatment parameters required for optimal safety and efficacy.

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INTRODUCTION

Defining Skin of Color

Defining skin of color in the Latino population can be particularly challenging as it encompasses several cultural and historical aspects. In general, skin of color identifies racial groups with darker skin hues other than that of white skin. The five racial categories defined by the U.S. Census Bureau are American Indian or Alaska Native; Asian; Black; Native Hawaiian or Pacific Islander; and White. The Hispanic population is estimated to rise from 55 million in 2014 to 119 million in 2060, an increase of 115 percent. By 2060, 29 percent of the United States is projected to be Hispanic—more than one-quarter of the total population.[1] This increase in population becomes pertinent as it follows with an increase in demand by people with mixed color tones for dermatologic laser procedures. Most of the current medical literature on cosmetic laser procedures has been devoted to individuals with fair skin tones (Fitzpatrick skin phototypes <III). One study determined that the most common skin problems affecting this group are photoaging, facial melasma, hyperpigmentation, acne vulgaris, and eczema/contact dermatitis.[2] The Latino population runs the gamut of Fitzpatrick phototypes and must be considered as a "one size does not fit all approach". Several ways to define skin of color as well predict higher risk patients have been described. We will refer to the Fitzpatrick phototypes throughout the article. Although general skin tone color may provide a good prediction about the potential for hyperreaction to lasers, we also use a simple, yet effective additional screen in the office: palmar and digital crease pigmentation. First described by Hector G. Leal-Silva MD of the Institute of Dermatology and Cosmetic Surgery, Monterrey, Mexico, the screen divides patients into four groups, depending on the concentration of pigment present in their palmar creases (Figures 1 and 2). The palmar and digital crease color hue is a way to predict the propensity of various Fitzpatrick phototypes to experience post-inflammatory hyperpigmentation. The scale ranges from 0 to 3, with the highest number indicating a darker skin tissue response despite skin phototype.[3] In general, a provider must be cognizant of their patients with mixed color tone in order to properly consult and discuss realistic expectations as well of potential risks.

FIGURE 1. Palmar and digital crease pigmentation as a predictive risk factor for developing post inflammatory hyperpigmentation.[3]

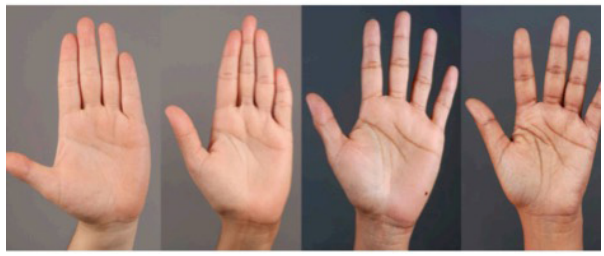
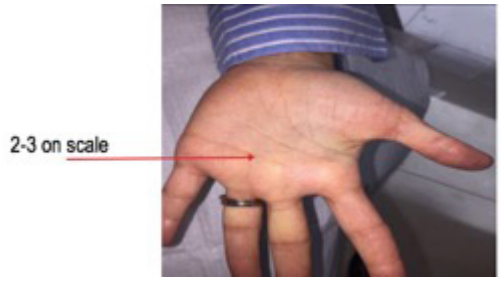


FIGURE 2. A depiction of scale 2-3 of palmar and digital crease color scale suggesting a medium to high risk of developing post inflammatory hyperpigmentation.



Pretreatment

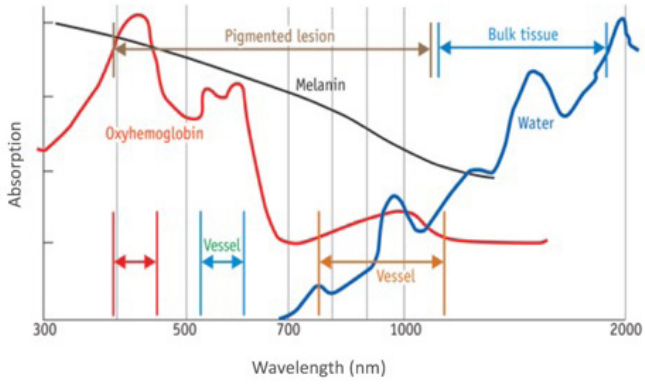
Safe treatment starts with a thorough pretreatment. We believe it is better to avoid laser procedures during the summer, when skin is at its darkest and there is a higher risk for sun exposure after treatment. A thorough history is obtained including history

of hyperpigmentation due to other traumas, allergy to lidocaine, personal or family history of photosensitizing conditions (ie, lupus erythematosus), herpes simplex, and recent intake of tetracycline or isotretinoin. Strict photo avoidance is discussed as well as protective measures including application of >SPF60 and oral sun protective supplement intake such as Heliocare, an oral extract of the Polypodium leucotomos fern. We also recommend a 6-week regimen aimed at lightening the area to be treated. The pretreatment regimen includes the application of hydroquinone 4-8%, the Miami Peel (modified Jessner's with kojic acid and hydroquinone), and/or Kligman's formula. A test-spot with follow-up in 2-4 weeks is also encouraged one month prior to treatment. Lastly, antiviral and antibiotic therapy is prescribed to the patient depending on laser device and treatment location.

Laser Science

The main principle describing the use of laser therapy is the concept of the target chromophore (Figure 3). A chromophore is a substance that absorbs specific wavelengths depending on its absorption coefficient. The three main endogenous chromophores targeted in lasers procedures are melanin, hemoglobin, and water. Melanin and hemoglobin are major chromophores for visible and near-infrared light while water is a major chromophore for far-infrared spectrum. For tissue damage to ensue, a wavelength should be preferentially absorbed by the chromophore in the target tissue and not the surrounding tissue, which may cause undesired effects (ie, dyspigmentation, scarring). To ensure maximized heat delivery to the target chromophore and the least risk to surrounding tissue, the wavelength delivered in a pulse duration should be less than or equal to the thermal relaxation time (TRT) of the target, a principle known as selective photothermolysis.[4] There are several laser parameters that when taken into consideration can attenuate the risk of hyperpigmentation and scarring, especially in mixed color tones. These parameters include longer wavelengths, longer pulse duration, lower fluence, lower densities (MTZ/cm2), efficient cooling (pre, concurrent, post) and smaller spot size.

FIGURE 3. Absorption spectra of different chromophores lasers can target using selective photothermolysis.



Chromophore: Hemoglobin

Vascular lasers, when used at the appropriate setting, can treat both light and dark skin tones in the Latino population. The main vascular chromophore is oxyhemoglobin. Darker phototypes (IV–VI) have more epidermal melanin that acts as a competitive chromophore against hemoglobin and oxyhemoglobin, therefore caution must be taken when targeting vascular lesions. Table 1 outlines the lasers we use in our practice for vascular lesions following with a discussion of selected lasers and skin conditions.

TABLE 1.

Laser and Light Devices Used in Practice that Target Vascular Lesions and Respective Wavelengths	
Pulsed dye laser	(585, 590, 595, 600nm)
Intense pulsed light	(400 to 1200nm)
Neodymium:yttrium aluminum garnet	(Nd:YAG) (532, 1064nm)
Long-pulsed alexandrite	(755nm)
Long-pulsed diode laser	(810nm)

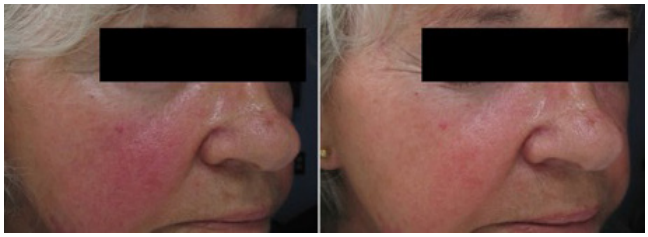
Pulsed Dye Laser

The pulsed dye laser (PDL) is a treatment of choice for vascular lesions such as telangiectasias. The 585nm wavelength pulsed dye laser penetrates to a desired depth of approximately 1.2 millimeters (mm). The longer 595nm wavelength allows for a slightly deeper penetration; however, the absorption coefficient of oxyhemoglobin is 3 times higher at 585nm than 590nm. In our opinion, the 585nm pulsed dye laser is superior in treating the vascular lesions such as port wine stains. In addition, both wavelengths are suitable for lighter complexioned skin tones (phototype IV and lighter). For darker phototypes V and VI, longer wavelengths should be utilized for treatment of vascular lesions. In addition, longer pulse durations should be used as it is safer in darker-skinned individuals. Treatment recommendation for rosacea with telangiectasias include 515nm with pulse duration between 12-15 (milliseconds) ms or higher. Alternatively, rosacea with telangiectasias and pigmentation require 570nm with pulse duration between 12-15ms or 500-600nm with pulse duration between 12-15ms.

Intense Pulsed Light

While there are many Intense Pulsed Light (IPL) devices available, the newer generation of IPL devices are as safe and effective as lasers in the management of skin conditions in darker skin tones. The patient's skin phototype and skin condition will determine the choice of suitable cut-off filters and therefore the spectrum of wavelengths to be emitted. The same principles that apply to lasers to reduce the risk of hyperpigmentation after treatment are also true with IPL. Figure 4 depicts improvement of vascular and pigmented lesions using the IPL device.

FIGURE 4. Before and after image of a Latina woman showing improvement of her vascular and pigmented lesions after one session the intense pulsed light (IPL) device.



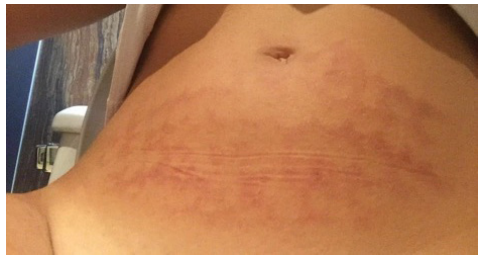
Chromophore: Melanin

Although there is no difference in the melanocyte density between Fitzpatrick phototypes, there is certainly an increase in the number and size of melanin granules within the basal layer keratinocytes in darker-skinned individuals. This large amount of melanin within the epidermis of darker skin types competitively absorbs laser light targeted for other chromophores. Subsequently, with the broad absorption spectrum of melanin, ranging from 250 to 1200nm, greater care and diligence must be taken when using lasers on Latino skin. A selective window for targeting melanin lies between 630 and 1100 nanometers (nm), where there is desired skin penetration and preferential absorption of melanin over oxyhaemoglobin. Absorption for melanin decreases as the wavelength increases, but a longer wavelength allows deeper skin penetration. Shorter wavelengths (<600nm) damage pigmented cells with lower energy fluencies, while longer wavelengths (>600nm) penetrate deeper but need more energy to cause melanosome damage. A longer pulse duration delivers slower laser light resulting in mitigated epidermal heating. Consequently, epidermal cooling is more effective thereby reducing rapid heating and damage to the melanosomes. The calculated TRT of melanosomes is less than 1 microsecond corresponding to 250 to 1000 nanoseconds. As previously discussed, a pulse duration less than the TRT will decrease risk of damage to the melanosome.

Hair Removal

With the advent of lasers with longer wavelengths, longer pulse durations, and efficient cooling devices, all skin types can be treated with lasers for hair removal with reduced risk of adverse outcomes. Caution must be taken when performing laser treatments in patients with a tan, in fact, it should be avoided to prevent adverse effects as seen in Figure 5. As the provider, it is important to ensure that the handpiece is perpendicular to the skin surface and to avoid overlapping during pulses. It is also essential to confirm the cooling device to functioning properly before starting the procedure. We believe two wavelengths are generally appropriate for use in dark Latino skin, which include the Diode laser 810nm at low fluence and high repetition rate "in motion" (up to phototypes V) and Nd:YAG 1064nm (up to phototypes VI).

FIGURE 5. Post inflammatory hyperpigmentation after using Nd:YAG on recently tanned skin.



Melasma

Melasma treatment is one of the most difficult and frustrating conditions to manage and unfortunately a very common condition among Latinos. The origin of hyperpigmentation can be epidermal, dermal, junctional, or a combination. A wood's lamp can be used to determine the depth. Given melasma has a hormonal component and is essentially caused by ultraviolet light exposure, it is expected to almost always return after treating. It is important to counsel patients that treatment does not cure their melasma. We generally turn to a laser when the case is resistant to more conservative treatment, which includes topical skin lighteners including Kligman's formula, and/or light peels, or oral tranexamic acid. In general lasers have revolutionized the treatment of dermatological disorders but its place in the management of melasma and post inflammatory hyperpigmentation (PIH) is still controversial. The QS-Nd:YAG is the most widely used laser for the treatment of melasma. Our parameter recommendation includes fluence less than 5 Joules/cm2, spot size 6 mm, and frequency of 10 Hz. Heat can exacerbate melasma, therefore a single pass should be performed on each area to be treated prior to additional passes. Specifically, up to three passes are performed, allowing the tissue to properly cool between passes. The toning procedure will utilize low fluence with a large spot size. The number of treatment sessions varies from 5 to 10 at 1-week intervals. Rebound hyperpigmentation could be due to the multiple sub threshold exposures that can stimulate melanogenesis in some areas, and/or inflammation with secondary PIH. Monthly or quarterly maintenance is performed to maintain results. The use of pulsed dye laser (PDL) for the treatment of melasma is based on the theory that skin vascularization plays an important role in the pathogenesis of melasma. Particularly, it is known that melanocytes express vascular endothelial growth factor receptors, which cause the telangiectasias. Table 2 outlines the lasers we use to treat melasma. Figure 6 depicts a Latina patient treated with two sessions with the Picosecond 1064nm laser two weeks apart.

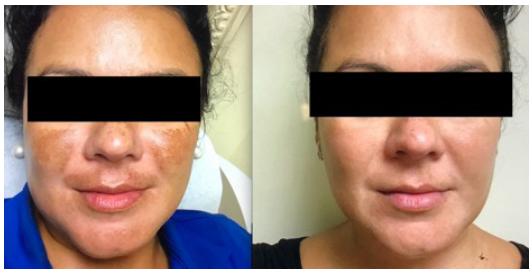
Chromophore: Water

Water is the targeted chromophore in most resurfacing procedures. Ablative resurfacing creates a controlled partial-thickness damage down to the dermis, therefore use in phototypes V and VI is usually not indicated due to the risk of dyspigmentation

TABLE 2.

Laser and Light Devices Used in Practice to Treat Melasma
IPL 570-580nm • Low fluence, internal and external cooling, long pulse duration (6-8 j/cm2-15ms)
Fraxel 1550nm • Low fluence, few passes, more sessions • The density used varies from 2000 to 2500 MTZ/cm2 and energy levels 6 to 10mJ/ms. The treatment sessions vary from 2 to 6 at an interval of 1–4 weeks
Ablative pixelated Er:YAG 2940nm
Affirm MPX Dual Fractional Laser 1320/1440nm
Picosecond 1064nm Laser

FIGURE 6. Before and after image of a Latina woman showing improvement of her melasma after two sessions using the Picosecond 1064nm laser two weeks apart.



and scarring. The emergence of the nonablative resurfacing lasers has allowed people of darker skin tones an opportunity to treat pigmented skin condition, rhytides, as well as skin texture, with less risk of side effects. Fractional or pixelated resurfacing is another safe nonablative device that can be used for resurfacing in people with skin of color. We outline the lasers we use in our practice for resurfacing in Table 3.

Skin Rejuvenation

Traditionally, ablative lasers, such as the carbon dioxide (CO2) and Erbium:YAG have been the gold standard in rejuvenation but can cause several unwanted side effects in Latino skin. Specifically, it has been described to cause hyperpigmentation in 31% of all skin types increasing to 50% in type III Fitzpatrick skin phototypes.[5] In addition, there can be a delayed onset of hypopigmentation and transient erythema lasting months. The increase in adverse effects when resurfacing patients with skin of color makes pre-treatment and patient selection important in order to reduce these outcomes. Some more appropriate treatment alternatives for darker skin types include non-ablative infrared, micro needling, and radiofrequency devices.

TABLE 3.

Resurfacing Lasers That Target Water	
Fractional	Fractionated 1550nm erbium doped fiber laser
Nonablative	Nd:YAG 1064nm
Ablative	CO2 10,600nm

The newer category of micro-ablative resurfacing lasers (fractional CO2, fractional Erbium, and the 2790nm Yttrium Scandium Gallium Garnet [YSSG]), offers a safer modality with which to treat Fitzpatrick skin type IV and above. Compared to the older generation resurfacing lasers the micro-ablative lasers minimize the amount and duration of erythema and edema, which can last just three to four days. A recent retrospective study of Chinese patients treated with the 1,550nm erbium-doped fractional laser (Fraxel 1550, Solta Medical) found that using fewer passes per treatment but increasing the total number of treatments was associated with a lower risk of post-inflammatory hyperpigmentation without compromising efficacy.[6]

Management of Complications

One of the most common malpractice lawsuits is laser complications. It is important to ensure that all laser practitioners are certified and that providers have reviewed laser laws their state. Pre- and post-treatment photos are essential. It is also important to document settings and informed consent. If an issue arises, the provider should make themselves available 24/7 and prepare for a lot of hand holding. The best treatment for complications is prevention. Table 4 outlines acute and chronic complication management that we practice in our office.

CONCLUSION

The use of lasers in people with skin of color requires an understanding of laser physics and laser tissue interactions. It is very important to be familiar with the laser device as not all energy-based devices work similarly. The Latino population encompasses the range of all phototypes and therefore one rule cannot apply to all Latinos. Proper selection of device, wave-

TABLE 4.

Complication Management	
Acute	Superficial erosions/bullae • Clean with a mild soap • Silver sulfadiazine Infectious (bacterial and viral) • Treat accordingly with antibacterial or antivirals erythema/pruritus • Control inflammation with a short pulse of a potent topical corticosteroid • Intralesional 5FU/Kenalog
Chronic	Pigmentation • Hyperpigmentation • Hydroquinone 8-10% cream • Lasers: IPL or qsNd:YAG • Sunscreen, SPF60 • Hypopigmentation • Moisturization • Latisse • Sun exposure • Scarring • Short pulses of potent topical steroid, Intralesional 5FU/Kenalog • Fractionated Er:YAG or CO2 • PDL and IPL at 515nm

length, and treatment parameters are essential for safety and efficacy. In addition, pre-and post-treatment protocols are pivotal in the prevention of dyspigmentation and scarring.

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