

# Mineral sunscreens with iron oxides are widely underused in skin of color patients suffering with bothersome dyschromia

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## Introduction

- ❑ UV radiation damages skin while enhancing features of aging and leading to development of skin cancers.<sup>1-2</sup>
- ❑ Visible light (400-700 nm) also exerts negative effects to skin due to ability to penetrate deeper than UVA or UVB rays<sup>3-5</sup>
- ❑ An immediate erythema response with combination of long-acting UVA1 and VIS is seen for Fitzpatrick I-III individuals
  - This combination induces inflammation and more potent & immediate pigment darkening in phototypes IV-VI<sup>6-7</sup>
- ❑ Physical sunscreens (containing zinc oxide and titanium dioxide) act as physical blocker of visible light and assist in preventing discoloration in Fitz IV-VI individuals<sup>8</sup>
  - These sunscreens may lead to white cast
  - To preserve cosmesis, these metal oxides are micronized while incorporation of iron oxide pigments into sunscreens to improve visible and blue light protection while reducing opaque shade<sup>10-11</sup>
- ❑ PIH and melasma are two of the 5 most common cutaneous diagnoses in skin of color patients<sup>12</sup>
  - Limited procedures available for these patients due to risk of increased pigmentation and scarring
  - Focus on recommending mineral sunscreen therapy for these patients for prevention and treatment of worsening dyschromia



## Purpose

- ❑ After a thorough PubMed search, only one previous study looked at sunscreen use in patients with hyperpigmentation<sup>15</sup>
  - ❑ No studies sought to understand skin of color patients' views on sunscreen use and the roles these formulations can have in dyschromia
- ❑ This survey and study highlights the current beliefs about mineral sunscreen use and current practices in the context of pigmentary disorders and sun/HEV light exposure in Fitz IV-VI
- ❑ Helps give providers tools to counsel their patients regarding these prevalent but preventable pigmentary disorders

## Materials & Methods

- Approval was obtained for this study by the LSUHSC IRB
- This study consisted of a cross-sectional anonymous, confidential survey conducted at LSU Baton Rouge MidCity Dermatology Clinic.
- The study included a total of 103 patients all Fitz IV-VI skin tones.
- Responses to survey were collected over a two-month period

## Results

Table 1: Survey	%
Sunscreen daily	19.2
Doctor instructed sunscreen use	27.9
Dermatologist instructed sunscreen use	26.9
Makeup with sunscreen (SPF) in it	19.4
Bothersome discoloration on face	60
Belief sunscreen can assist with discoloration	23.3
Use of products for increased pigmentation or "dark spots" on face	13
Tinted sunscreen use	5.8
Willingness for daily sunscreen better matched to skin color	63
Willingness for multiple applications of sunscreen throughout the day	66
Other Reported Values	
Hours spent/ day outdoors	Average 4 hours
Hours spent/ day driving	3 hours
Hours spent/ day in front of computer (including tablet), smartphone, or TV	7.25 hours
Budget to spend on sunscreen to help with discoloration	\$10-20

- ❑ Discoloration was a common problem experienced by participants with 60% of patients acknowledging discoloration in their face that bothered them
  - ❑ Only 11 % of these patients wore sunscreen daily
  - ❑ Only 22% of these respondents believed that sunscreen could help their dyschromia
  - ❑ 77.8% of patients with discoloration said they were willing to wear sunscreen daily if it better matched their skin tone
- ❑ Most patients reported \$10-20 budget for discoloration problems

**Table 2:** Common SPF 30+ chemical and mineral sunscreens recommended by skin of color patients or skin of color dermatologists

Chemical	\$/oz	Mineral	\$/oz
Eucerin Daily Hydration Cream	1.32	*Cotz Flawless Complexion	10.00
Neutrogena Hydroboost Water Gel Lotion	5.33	*SunBun Mineral Sunscreen Face Tint	10.58
Supergoop Play Everyday Lotion	5.82	*Elta MD UV Elements	18.25
La Roche Posay Toleriane Double Repair	8.00	*MD Solar Sciences Mineral Crème	18.82
Aveeno Positively Radiant	8.00	*Isdin Eryfotona Ageless Tinted	19.41
		Supergoop Sheer Mineral	25.33
		Eleven by Venus Unrivaled Sun Serum	50.00

Note: Price information listed (in US dollars/ oz) has been obtained through various online sources including national commercial websites  
\*formulations contain iron oxides

## For Physicians

Table 3: General Survey Questions	Y	N
1. Do you use sunscreen daily?		
2. Has a doctor/dermatologist spoken to you about importance of sunscreen?		
3. Do you use makeup with sunscreen (SPF) in it?		
4. Do you get discoloration on your face that bothers you?		
5. Do you think sunscreen will help any discoloration problems you are experiencing with your skin?		
6. Do you have any products you use for increased pigmentation or "dark spots" on your face?		
7. Have you ever used tinted sunscreen?		
8. Would you be willing to wear sunscreen every day if it was better matched to your skin color?		
9. Would you be willing to apply sunscreen multiple times throughout the day if spending > 2 hours outdoors/driving?		
Other Questions		
10. What sunscreen do you use? (if applicable)		
11. How many hours do you spend/ day outdoors?		
12. How many hours in a day do you drive?		
13. How many hours/ day do you spend in front of computer (including tablet), smartphone, or TV?		
14. How much would you budget to spend on sunscreen to help with discoloration? (if applicable)		

## Discussion

- ❑ Our survey shows similar results to other studies regarding low frequency of sun protective behavior with only 19% of users reporting daily sunscreen use.<sup>13</sup>
- ❑ Affordability may be significant barrier to this patient population
  - All reported branded sunscreens in survey were chemical in nature (generally much lower in cost compared to physical blockers as listed in Table 2.)
- ❑ There is a potential gap of knowledge about the value of sunscreen use which may contribute to sunscreen underuse in these skin of color patients
  - Only ~27% reported previous sunscreen counseling from physician or dermatologist.
  - Consistent with findings demonstrating less screening and education programs have historically been targeted toward the AA population.<sup>14</sup>
- ❑ Almost 80% of this sample patient population could benefit from education about sunscreen's role in treating their discoloration problems.
  - Previous studies showed increased sunscreen use for dyschromias attributed to sun exposure<sup>15</sup>

## Conclusions/ Teaching Points

- Sun safety behavior and knowledge warrants increased attention in SOC patient population to address the low prevalence of sunscreen use among these patients.
- Mineral sunscreens (& tinted sunscreens) should be emphasized as essential component for hyperpigmentation treatment plans.
- Dermatologists should be aware of patients' low perception of the relationship between UV/VIS exposure and dyschromia and may consider incorporating screening surveys to more efficiently identify at-risk patients for dyschromia secondary to UV/VIS.
- Dermatologists should provide resources in finding most affordable mineral sunscreens most compatible with patients' skin tones to assist in masking existing dyschromia and provide overall skin protection.

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