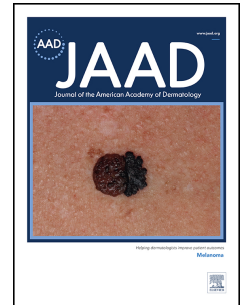


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**Patch Testing Results in Skin of Color: A Retrospective Review
from the Massachusetts General Hospital Contact Dermatitis Clinic**

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Allergic contact dermatitis (ACD) is estimated to affect about 20% of the population.¹ Out of the 308.7 million people estimated in the United States (US), 38.9 million (13.0%) are Black, 14.7 million (5.6%) are Asian, and 50.5 million (16.3%) are Latinx.² However, recent patch testing data demonstrates limited diversity, with only 4.8% of Black and 2% of Latinx patients represented.³ This may signify under recognition of ACD in patients of color due to lack of patch testing access or diversity in referral centers. In order to narrow this gap, we conducted a retrospective registry review of 2,310 patients patch tested between 2007 and 2016 at the Massachusetts General Hospital in Boston, MA. Patients were stratified into four races: Asian, Black, Latinx, and White and testing was performed and assessed by a single provider (P.C.S.). Comparison of demographics and allergen frequencies between White and Asian, White and Black, and White and Latinx were carried out by contingency tables using a 2-tailed χ^2 test or Fisher exact test. P values of less than 0.05 were considered significant. Bonferroni correction was not conducted given exploratory analysis as in previous studies.³ Patient demographics are summarized in Table 1. Most patients identified as White with 192 (8.3%) Asian, 58 (2.5%) Black, and 127 (5.5%) Latinx. There were no significant differences between enrollment of racial groups during this time. A history of hay fever was less prevalent in the Latinx group compared to Whites. We found the Asian group had significantly more patients with facial dermatitis compared to the White group with less cases of foot dermatitis. The Latinx cohort had significantly less cases of truncal dermatitis. All three minority groups presented with significantly higher numbers of atopic dermatitis (AD) as their primary final diagnosis. Patch test reactions are presented in Table 2. In comparing different racial groups, the Asian group had significantly more positive reactions to cinnamic aldehyde (7.3% vs 3.0%, $p < 0.01$), colophony (4.1% vs 2.4%, $p < 0.01$) and nickel (30.2% vs 18.4%, $p < 0.001$) compared to Whites. There

were no significant differences between the Black or Latinx groups compared to Whites. To our knowledge, this is the first study to examine the most common contact allergens in Asians, Blacks and Latinx individuals. There are several limitations to our study. The small number of patients in each minority group could limit our conclusions. This may be because of lack of subspecialty referral, language or cultural barriers, low rates of medical insurance, or limited knowledge of health services.⁴ Additionally, we did not further subcategorize the Latinx ethnicity group into different races. Historically skin of color patients have been underrepresented in dermatologic literature, but the US population is diversifying. Our data begins to broaden the patch testing literature for these populations, and future studies are encouraged on this important topic.

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1. Lim HW, Collins SA, Resneck JS Jr, Bologna JL, Hodge JA, Rohrer TA, et al. The burden of skin disease in the United States. *J Am Acad Dermatol*. 2017;76:958Y972.e2.
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4. McGown MA, Goldenberg A, Jacob SE. Contact dermatitis in underrepresented minority children. *Dermatitis*. 2018; 29(2): 97-99. (4)

Table I. Demographic Characteristics

<u>Characteristics</u>	<u>Race</u>			
n (%)	White	Black	Latinx	Asian
Total Number of Patients	1933 (83.7%)	58 (2.5%)	127 (5.5%)	192 (8.3%)
Male	533 (27.6%)	13 (22.4%)	35 (27.6%)	35 (18.2%)
Occupational ^a	31 (1.6%)	2 (3.4%)	4 (3.1%)	2 (1.0%)
Atopic Triad: Hay Fever	642 (33.2%)	14 (24.1%)	29 (22.8%)*	55 (28.6%)
Atopic Triad: Eczema	565 (29.2%)	22 (37.9%)	33 (26.0%)	63 (32.8%)
Atopic Triad: Asthma	367 (18.9%)	9 (15.5%)	31 (24.4%)	38 (19.8%)
Hand	603 (31.2%)	25 (43.1%)	38 (30.0%)	60 (31.2%)
Leg	400 (20.7%)	8 (13.8%)	19 (15.0%)	38 (19.8%)
Face ^b	1,308 (67.6%)	37 (63.8%)	90 (70.9%)	161 (83.9%)*
Age >40yr	1367 (70.7%)	27 (46.5%)*†	68 (53.5%)*†	87 (45.3%)*†
Positivity rate (>1 allergen)	1165 (60.3%)	28 (48.3%)	81 (63.8%)	121 (63.0%)

^a Includes any skin condition that is concluded to be occupationally related to dermatitis

^b Includes ear, lip, perioral, and periorbital areas

*Significantly different from white patients at $p < 0.05$

†Significantly different from white patients at $p = < 0.001$

138 **Table II. Positive Patch Test Reactions by Race**

Allergen		White	Black	Latinx	Asian
	%	PPT %	PPT %	PPT %	PPT %
2-Bromo-2-nitropropane-1,3-diol	0.5 pet	3.3	3.5	3.2	2.6
2-Hydroxy-4-methoxybenzophenone	3.0 pet	0.7	5.2	0.8	0.5
2-Mercaptobenzothiazole	1.0 pet	0.9	0	1.6	1.6
4-Phenylenediamine base	1.0 pet	3.7	5.2	6.3	5.2
4-tert-Butylphenolformaldehyde resin	1.0 pet	1.1	0	0.8	2.1
Amerchol L 101	50.0 pet	3.3	0	2.4	2.6
Bacitracin	20.0 pet	8.2	1.7	6.3	5.7
Balsam of Peru	25.0 pet.	13.6	8.6	11.0	13.5
Benzocaine	5.0 pet	1.5	0	1.6	1.0
Budesonide	0.01 pet	0.6	0	0	0.5
Carba mix	3.0 pet	4.2	3.5	7.1	5.7
Cinnamic aldehyde	1.0 pet	3.0	0	2.4	7.3*
Cobalt chloride	1.0 pet	6.9	10.3	7.9	9.4
Cocamidopropyl betaine	1.0 aq	0.5	1.7	0.8	0.5
Colophony	20.0 pet	2.4	1.7	2.4	4.1*
Compositae Mix II	5.0 pet	1.1	0	0	1.2
Dialkyl thiourea	1.0 pet	0.8	0	0	0.0
Diazolidinyl urea	1.0 pet	2.5	0	1.6	3.6
Dimethyloldihydroxyethyl eneurea	4.5 aq	0.2	1.7	0.8	0.0
Disperse Blue mix 106/124	1.0 pet	1.2	0	1.6	2.1
DMDM Hydantoin	1.0 pet	1.9	1.7	0	1.6
Epoxy Resin	1.0 pet	1.1	0	0.78	0.0
Ethyl acrylate	0.1 pet	0.7	0	0	0.0
Ethylenediamine dihydrochloride	1.0 pet	1.6	0	0	0.5
Ethyleneurea, melamine formaldehyde mix	5.0 pet	1.5	5.2	0	1.6
Formaldehyde	1.0 aq	2.7	3.5	0	2.1
Fragrance Mix	8.0 pet	14.1	5.2	17.3	19.3
Fragrance mix II	14.0 pet	6.1	3.5	3.2	3.6
Glutaraldehyde	0.5 pet	0.6	0	0.8	0.5
Glyceryl monothioglycolate	1.0 pet	1.0	0	0.8	1.6
Hydrocortisone-17-butyrate	1.0 pet	0.1	0	0.8	0.0

Imidazolidinyl Urea	2.0 pet	2.2	1.7	1.6	4.1
Iodopropynyl butyl carbamate	0.2 pet	2.0	1.7	5.5	0.0
Methylchloroithiazolinone/Methylisothiazolinone	0.01 aq	4.3	0	3.2	2.6
Mercapto Mix	1.0 pet	0.7	0	0.8	1.0
Methyl methacrylate	2.0 pet	0.7	1.7	0	0.0
Methyldibromoglutaronitrile	0.5 pet	3.9	1.7	4.7	2.1
Methylisothiazolinone	0.2 aq	4.4	0	3.2	2.0
N-Isopropyl-N-phenyl-4-phenylenediamine	0.1 pet	1.0	0	0.8	1.0
Neomycin sulfate	20.0 pet	9.6	8.6	11.8	5.7
Nickel sulfate	2.5 pet	18.4	13.8	22.0	30.0†
Paraben mix	12.0 pet	1.0	1.7	3.2	2.1
4-Chloro-3,5-xlenol (PCMX)	1.0 pet	0.8	0	0	1.0
Potassium dichromate	0.25 pet	6.2	1.7	3.2	6.3
Propylene glycol	30.0 aq	3.0	8.6	1.6	3.1
Quaternium 15	2.0 pet	6.2	6.9	2.4	6.3
Sesquiterpene lactone mix	0.1 pet	0.6	1.7	0	0.0
Thiuram Mix	1.0 pet	2.3	1.7	3.9	2.6
Tixocortol-21-pivalate	0.1 pet	2.6	0	1.6	1.0
Toluenesulfonamide formaldehyde resin	10.0 pet	1.3	1.7	2.4	0.5

*Significantly different from white patients at $p < 0.05$

†Significantly different from white patients at $p < 0.001$

Abbreviations: Aq, aqueous; PPT, positive patch test; PET, petrolatum;

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Amerchol L 101	50.0 pet	3.3	0	2.4	2.6
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Budesonide	0.01 pet	0.6	0	0	0.5
Carba mix	3.0 pet	4.2	3.5	7.1	5.7
Cinnamic aldehyde	1.0 pet	3.0	0	2.4	7.3*
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Iodopropynyl butyl carbamate	0.2 pet	2.0	1.7	5.5	0.0
MCI/MI	0.01 aq	4.3	0	3.2	2.6
Mercapto Mix	1.0 pet	0.7	0	0.8	1.0
Methyl methacrylate	2.0 pet	0.7	1.7	0	0.0
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