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## Abstract

**Rationale:** Our aim is to characterize phenotypic differences between African American and White children with food allergy (FA).

**Methods:** We are conducting a prospective multi-center cohort study enrolling African-American (AA) or White (W) children aged 0-12 years diagnosed with food allergy and seen in allergy/immunology clinics at four urban tertiary centers in the US. To test for associations between demographic variables (race, age) and allergy/atopy, we used chi-square tests for independence

**Results:** Currently there are 492 children (170 AA and 322 W) with complete intake information enrolled in the study. We found a significant association between race and self-reported allergies of fin-fish (AA 21.2%, W 8.1%,  $P < 0.001$ ), shellfish (AA 30%, W 7.5%,  $P < 0.001$ ), soy (AA 11.2%, W 5.6%,  $P < 0.05$ ), wheat (AA 13.5%, W 4.0%,  $P < 0.01$ ) and sesame (AA 8.2%, W 21.7%,  $P < 0.001$ ). In regards to comorbidities, AAs had a higher prevalence of allergic rhinitis (AR) and asthma than whites [40.9% W, 59.9% AA ( $P < 0.001$ ) and 58.9% AA, 27.8% W ( $P < 0.001$ ) respectively]. In relation to age, both races reported older children having a higher likelihood of AR and asthma ( $P < 0.001$ ) than younger children.

**Conclusion:** We observed that AA children had higher odds of allergy to shellfish, fin-fish, soy and wheat while Whites had higher odds of allergy to sesame seed. We also found a significant association between race and AR/asthma, as well as race and age.

## Background/Rationale

- Food allergy prevalence is increasing in all races and ethnicities in the United States and is currently at 7%.
- W and AA children have a unique food allergy (FA) phenotypic difference in regards to specific allergens, symptom reaction and severity as well as endotypic differences such as hyper-eosinophilia.
- Health care utilization and FA phenotypes differ in AA and W children in the United States
- As part of FORWARD, we aimed to characterize the FA phenotypic differences between AA and White children.

## Methods

Large Prospective multi-center Cohort study of AA or W children with food allergy ages 0-12 were enrolled at four urban tertiary centers in the US. Parents/guardians of children with IgE-mediated food allergy and/or atopic disease were asked to complete a Food Allergy Questionnaire and electronic quarterly surveys that took into account:

- Type and onset of food allergy
- Onset of Atopic Dermatitis
- Type of immune reaction to the specified food allergy
- Other associated health conditions of the child e.g. Allergic rhinitis/Asthma
- Family history of food allergy, atopic dermatitis, allergic rhinitis
- Recent allergen exposure and Emergency room visits

The second year results were analyzed to evaluate the link between race and physician-diagnosed FA and self-reported comorbid allergic disease among the participants.

Statistical analysis: Proportions and Chi-square tests was used for independence to test for associations between demographic variables (race, age) and food allergy/atopy

## References

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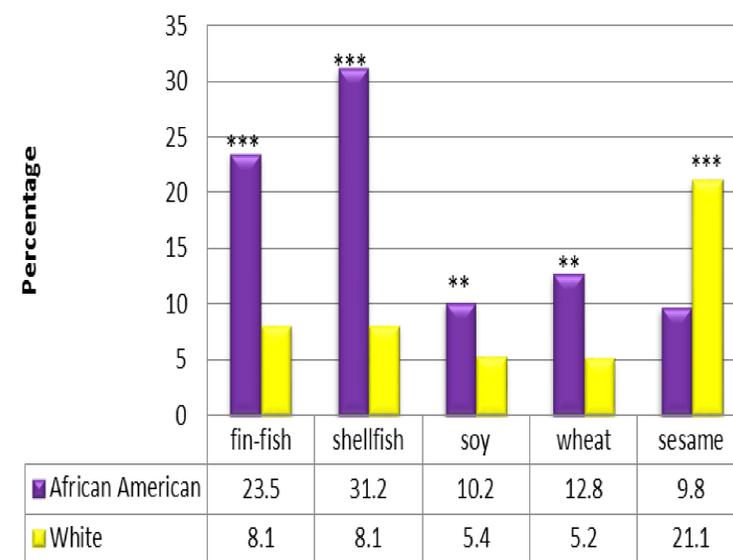
## Results

### Demographics

Characteristics	% of African Americans	% of Whites
<b>Gender</b>		
Male	66.1	61.0
Female	33.9	39
<b>Age</b>		
< 3 Years	9.2	19.2
3 to 6 Years	23.1	32.2
6 to 9 Years	28.4	22.3
9 + years	39.3	26.3

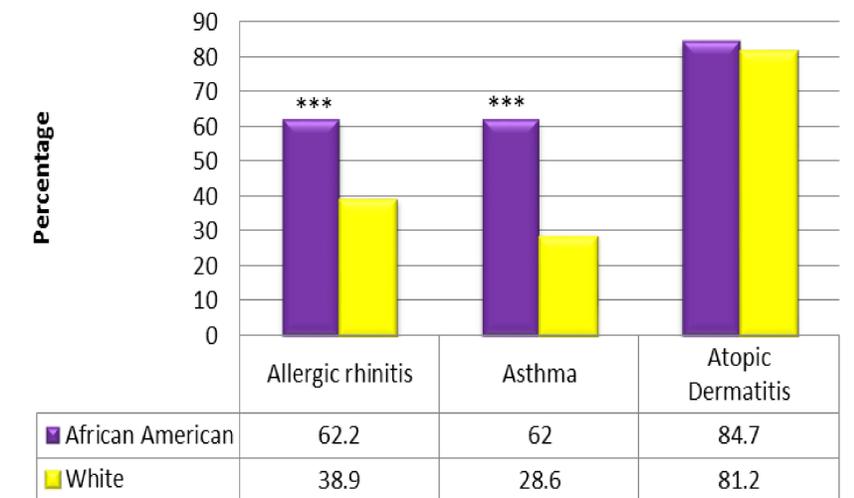
- Fig 1 - To date, 641 children (234 AA and 407 W) have been enrolled in the study. This shows the percentage of children enrolled in the study in relation to Gender, Race and Age group.

### Current Food Allergies



- Fig 3 – There was a significant association between race and self reported allergies of Finfish, shellfish, soy, wheat and sesame ( $P < 0.001$ ,  $P < 0.001$ ,  $P < 0.05$ ,  $P < 0.01$  AND  $P < 0.001$  respectively).

### Comorbid Conditions



- Fig 2 – AA reported a higher prevalence of AR and ASTHMA than Whites ( $P < 0.001$  and  $P < 0.001$  respectively) .
- No observed association between race and eczema (84.7% of Blacks, 81.2% of Whites) ( $p > 0.05$ )

## Discussion

- Both races reported older children having a higher likelihood of allergic rhinitis and asthma than younger children
- Adjusting for sex and age, older male AA children had higher odds of having asthma than older AA females.
- There was a significant association between age and food allergens. In AA, the proportion of those with tree nut allergy increases with age while in Whites the proportion of those with Peanut allergy increases with age. ( $P$  value  $< 0.011$  and  $< 0.013$  respectively)
- There is a link between the shorter duration of follow up with an allergy specialist and higher rates of food allergen related anaphylaxis and emergency department visits in AA
- Further studies should be done to understand the multifactorial etiology of the higher prevalence of severity of specific food allergens in AA vs whites e.g. Food introduction practices, health care utilization, exposure to house dust mite and cock roaches, socioeconomic status.

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