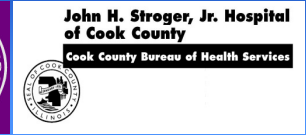


# Evaluation of Ethnicity, Sensitization, and Asthma Severity in an inner City Community Based Cohort: the Chicago Initiative To Raise Asthma Health Equity (CHIRAH)

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## Abstract (Poster revision - full data set with new findings)

**Rationale:** Very little literature on inner city asthmatic subjects' patterns of sensitization is from community-based samples, and almost none is from adults. We compared sensitization to dust mite and cockroach in African Americans (AA) vs. all others, and Latinos (LA) vs. all others in a large community-based sample of children and adults.

**Methods:** This is a cross-sectional analysis of the Chicago Initiative to Raise Asthma Health Equity cohort, a community-derived cohort of both children (aged 8 to 14 years, n=398), and unrelated adults (aged 18-43, n=250) with asthma. Asthma was a self-reported diagnosis and active, based on use of asthma-related medications. Race (self report) and sensitization (ELISA) were determined at baseline. Severity was classified by the presence of a hospitalization or an emergency department visit in the last year.

**Results:** For children, AA subjects were more commonly sensitized to roach (OR=1.8, p=0.03). For adults, univariate analysis found LA subjects more commonly sensitized to dust mites (OR=1.9, p<0.05) and AA subjects more commonly sensitized to roach (OR=2.1, p<0.01). These differences were no longer significant when income and household size were included. Secondary multivariate analyses evaluated the correlation of severity to sensitization stratified by ethnicity. Sensitization to dust mite was a predictor of severity only in AA adults (OR=2.7, p<0.009). Roach sensitization was not predictive in any group.

**Conclusions:** Correlations of ethnicity with patterns of sensitization are modified by SES. The relationship of sensitization and asthma exacerbation is not as prominent in this community based sample as in medically based recruitment. This may be due to the fact that this cohort will have less selection bias, with a less severe cohort recruited. **Funding Source:** NHLBI grant 1U01 HL072496-01

## Background

• Inner city minority populations experience a greater degree of morbidity, mortality and prevalence of asthma (1-3)

• Exposure to high levels of roach allergen in sensitized individuals increases the rates of hospitalization 3 fold (4)

• Prior asthma studies have shown higher rates of sensitization to Roach in African American subjects (4,5)

• There is a dose response effect between exposure and sensitization (6) and lower SES is associated with greater levels of exposure (7).

• This would not explain the ethnicity specific differences in individuals of the same SES. Indeed there have been 2 studies suggesting that ethnicity exerts an effect independent of SES (5,8)

## Objectives

**Primary:** To determine the patterns of sensitization to common indoor allergens (dust mite and roach) in our inner city population, and evaluate any differences associated with ethnicity.

**Secondary:** To determine if these differences in sensitization are determinants of morbidity in this community based cohort.

## Materials and Methods

• School based screening. Sampling ensured a sample which was equally representative of poverty and non-poverty households with high representation from minority and white households.

• Inclusion: 1.) either children (8-14 y) /caregiver dyads, or adults (18-40y) 2.) a prior asthma diagnosis. 3.) used asthma medication at least 8 weeks in the prior year.

## Materials and Methods (cont.)

• N= 360 child/caregiver dyads and 273 adult subjects with a cap-RAST to dust mite and cockroach allergens.

• Positive Cap-RAST levels were those >0.35 ku/L.

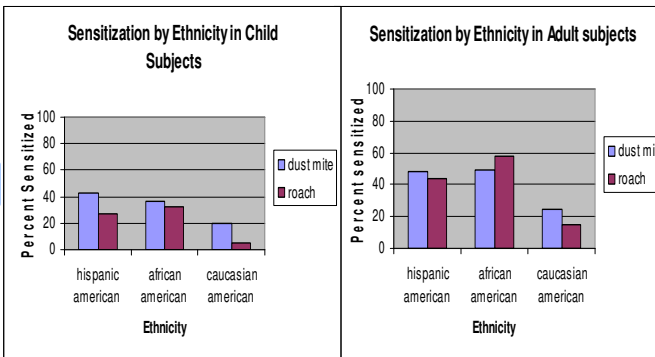
• Ethnicity by self designation from NCHS categories.

• Multivariate analyses were carried out to determine if ethnicity was associated with sensitization independently of household density, or income as measures of SES.

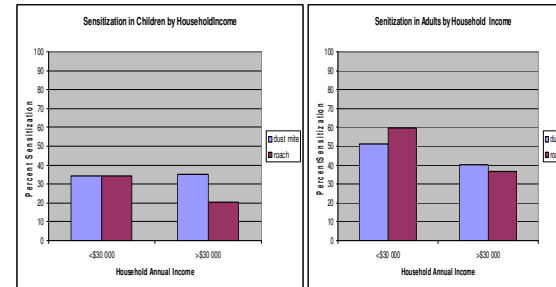
• Secondary analyses were carried out to determine if the pattern of sensitization was independently associated with severity (2 or more combined ED and urgent care visits in the last year). Covariates included measures of income, smoke exposure, insurance status, and inhaled steroid use.

## Results

DEMOGRAPHIC CHARACTERISTICS OF SAMPLE			
CHILDREN (N= 360)		ADULTS (N= 273)	
AGE(y) MEAN(SD)	10.5 (1.8)	AGE (y) MEAN(SD)	30.8 (6.0)
SEX (M% :F%)	59.1 : 40.9	SEX (M% :F%)	21.9 : 78.1
RACE (%)		RACE (%)	
AFRICAN AMERICAN	64.1	AFRICAN AMERICAN	59.2
HISPANIC	18.8	HISPANIC	27
WHITE	17.1	WHITE	13.8
HOUSEHOLD INCOME (%)		HOUSEHOLD INCOME (%)	
<\$30000/YEAR	50.3	<\$30000/YEAR	51
>\$30000	49.7	>\$30000	49
CAREGIVER EDUCATION(%)		EDUCATION(%)	
> HIGHSCHOOL	17.7	> HIGHSCHOOL	16.4
HIGHSCHOOL	68.1	HIGHSCHOOL	65.6
<HIGHSCHOOL	14.2	<HIGHSCHOOL	18
# urgent/ ED visits Mean (SD), min/med/max	2.44(4.34), 0/2/50	# urgent/ ED visits Mean (SD), min/med/max	1.99(3.17), 0/1/24
Insured (medicaid or private)	90.1	Insured (medicaid or private)	87.4
USED A STEROID		USED A STEROID	
INHALER >7 days/14	16.6	INHALER >7 days/14	10.6
FEV1(%pred.) mean(SD)	98.8 (15.4)	FEV1(%pred.) mean (SD)	88.4 (18.5)



## Results (continued)



### •PRIMARY ANALYSIS:

#### •CHILDREN:

•Dust mite

•African American (AA) children (OR=2.6, 95%CI 1.2-5.4; p=0.011) were more commonly sensitized to dust mite than white children.

•Hispanic american (HA) children were also more commonly sensitized than white children (OR =3.5, 95%CI 1.5-8.2; p=0.003).

•no differences between HA and AA children (p=0.280)

•Roach

•AA children were more likely to be sensitized to roach than white children with an OR of 7.2 (95%CI 2.1-24.3; p=0.001).

•OR of 6.0 (95%CI 1.6-22.0; p=0.007) for HA children

•no differences between AA and HA (p=0.549)

•ADULTS:

•Dust mite

•AA adults (OR=2.5, 95%CI 1.1-5.9; p=0.034) were more commonly sensitized to dust mite than white adults.

•This was also true for HA adults (OR =2.7, 95%CI 1.1-6.5; p=0.031).

•no differences between HA and AA (p=0.852)

•Roach

•HA adults were also both more likely to be sensitized to roach than white adults with OR of 4.4 (95%CI 1.5-12.6; p=0.006)

•AA adults also were more likely to be sensitized to roach with an OR of 6.4 (95%CI 2.3-17.8; p=0.0001)

•no differences between AA and HA (p=0.194)

## Results (continued)

### •SECONDARY ANALYSIS:

•Sensitization to dust mite (OR = 6.2, 95%CI 1.8-22.0; p=0.005) and roach (OR= 6.7, 95%CI 1.7-26.4; p=0.007) were associated with increased severity in HA children.

• No associations in AA Children, or in both HA and AA adults.

## Summary

•In both children and adult subjects, African American and Hispanic American subjects were more likely to be sensitized to dust mite and roach than white subjects.

•Measures of SES were included in multivariate analysis.

•Sensitization status was associated with health care utilization only in Hispanic American Children in this cohort. This may have been more universal if the degree of exposure was available as a variable.

## Discussion

•Differences in rates of sensitization were not explained by the measures of SES in the model.

•This may not be necessarily due to biologic factors as exposure and neighborhood factors were not included in analysis.

•The relationship of sensitization and severity is not as prominent in this milder community based sample compared to medically recruited cohorts. However, this is a secondary analysis of subgroups. The numbers in some of the subgroups may have affected power.

•To further investigate this, studies directed at correlating exposure levels, sensitization and exacerbations in a community based cohort would be optimal. Prior studies were in medically recruited cohorts and hence would have some degree of selection bias (4).

•Funding Source: NHLBI grant 1U01 HL072496-01

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