Caregiver Characteristics of Urban African-American Children Living With Severe Asthma

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Background

What is Asthma?

- Asthma is a chronic lung disease that causes inflammation and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning (CDC, 2016)
- Asthma affects people of all ages, but it most often starts in childhood. It affects over 300 million people worldwide (World Health Organization, 2016).
- In the United States, more than 22 million people are known to have asthma. Nearly 9 million of these people are children (CDC, 2016)
- Asthma morbidity is conceptualized as: high **symptoms days, nights and ER related visits** due to asthma (NHLBI, 2010)

Effects of Asthma on Children:

- The burden of childhood asthma is extensive, including high rates of hospitalizations and emergency department visits (Lee et al. 2011) Sharma et al., 2007).
- Absenteeism from school and work (Lee et al. 2011)
- Impaired quality of life (Sharma et al., 2007)
- Minorities particularly, African American children suffer disproportionately from asthma[4]
- The majority of children living in urban communities with asthma, are African American, which is evident when examining racial disparities in asthma management (Rierra & Walker, 2010).
- In addition to these major factors, caregivers of children with asthma have similar characteristics that may contribute to the increase of asthma morbidity in this population

Caregiver Characteristics

Psychosocial factors such as parental stress and depression have been shown to be associated with increased asthma morbidity in children living in urban communities, particularly in caregivers who have children with severe asthma (Yamamoto & Nagano, 2015). Several studies have shown similarities in caregivers of children with asthma such as exhibiting depressive symptoms, being highly stressed, having low education, and being a smoker which has been seen to contribute to childhood asthma disparities (Han, Lee, & Guo, 2009; Teach, Crain, Quint, Hylan & Joseph, 2006; Thakur et al., 2014).

Social Determinants of Health

Health disparities that affect African American children and their families are often concentrated by neighborhood and social status. Thus leaving the most vulnerable to have poorer health outcomes.
The social determinants of health framework acknowledges the **social, physical, and economic** environments as factors that interact with one another and all contribute to the health of the population.

Purpose & Hypothesis

To identify common characteristics among African American caregivers who have children with severe asthma in order to properly design asthma education and prevention programs for inner city children

We hypothesize that children with severe asthma morbidity are more likely to have caregivers' who smoke, are highly stressed and are of low socioeconomic status.

Methods

The data used for this analysis is baseline data from a randomized controlled study, Pediatric Asthma Alert Leader (PAAL) study for the purposes of secondary data analysis. PAAL was designed to evaluate the effectiveness of a parent-physician asthma communication intervention on reducing emergency department (ED) visits in children living in an urban community with persistent uncontrolled asthma. The study was approved by the Institutional Review Board at The John Hopkins University.

Eligibility criteria: 1) have had physician-diagnosed asthma based on caregiver report with validation from the child's physician. 2) have at least one emergency room visit (ER) visit or 1 hospitalization for asthma within past 12 months; 3) have mild to severe persistent asthma based on National Heart, Lung, & Blood Institute guidelines criteria of having any one of the following: a) An average of >2 days per week of asthma symptoms, b) >2 days per week with rescue medication use (albuterol, xopenex) or c) >2 days per month of nighttime symptoms; 4) be at least 3 years of age but no more than 10 years of age; 5) Reside in the Baltimore Metropolitan Area; 6) Not currently be participating in another asthma study; 7) Not have a sibling enrolled in the study. Exclusion Criteria included: 1) inability to speak and understand English, 2) no access to a working telephone or alternate telephone for follow up surveys, 3) a co-morbid respiratory condition including cystic fibrosis, chronic lung disease (BPD), lung cancer, tracheotomy that could interfere with the assessment of asthma-related outcome measures; 4) Children residing in foster care or where consent cannot be contained from a legal guardian. After determining eligibility, caregivers signed informed consent to participate in the study. Caregivers received $30.00 gift certificates for completion of the baseline survey.

Participants (*N* = 300) were recruited from both The Johns Hopkins University Hospital and University of Maryland Hospital in Baltimore, Maryland. Socio-demographics, health characteristic data, and caregiver interview data were examined to ascertain factors that contribute to asthma morbidity. Outcome variables that were used to conceptualize asthma morbidity were: number of daytime symptoms and nighttime symptoms in the past two weeks. Predictor variables included: 1) child age, 2) caregiver age, 3) smoking practices, 4) caregiver daily stress score 5) caregiver asthma stress score and 6) employment.

Analysis plan

Analyses were conducted using IBM Statistical Package for the Social Sciences 23.0 for Windows. Variables were screened for outliers and missing values. All data were screened for data analysis entry accuracy and to ensure that the assumptions of the statistical tests were met. Normality, issues of collinearity, and equality of variance were screened and examined using standard cut offs. Hierarchical multiple linear regression analyses with 5,000 bootstrap resamples (Wright, London, & Field, 2011) were used to examine the effect independent variables had on the asthma morbidity measures.

Results

Baseline sociodemographic of caregivers (n=300)

Caregiver	
Birth mother	276 (92)
Birth father	9 (3)
Grandfather	1 (0.3)
Sibling	8 (2.7)
Uncle	5 (1.7)
Caregiver educational level	
<9th grade	6 (2.0)
Some HS	83 (27.7)
HS grad or GED	117 (39.0)
Some college	81 (27.0)
Four year college	12 (4.0)
Caregiver income	
< $10,000	131 (43.7)
$10,000-19,999	56 (18.7)
$20,000-$29,999	37 (12.3)
$30,000-39,999	12 (4.0)
Over $40,000	24 (8.0)
Caregivers that smoke	
Self	104 (34.7)
Daily stress score	
<3	31
3-5	83
>5	183
Daily asthma stress score	
<3	93
3-5	59
>5	143

Child health characteristics (*N*= 300)

Age 3-5 years	166 (55.3)
Age 6-10 years	134 (44.7)
Asthma morbidity measures	
ER visits in the past six months	
1	78 (26.2)
Greater than 1	220 (73.8)
Symptoms nights in past 2 weeks	
0-4 days	142
5 or more days	182
Symptoms days in past 2 weeks	
0-4 nights	122
5 or more nights	174

Results of Multiple Linear Regression with Number of Symptoms Days Past 14 Days as a Dependent Variable

Variables	Model 1		Model 2		Model 3	
	B	β (SE β)	*B*	β (SE β)	*B*	β (SE β)
Constant	7.82 (1.93)		5.99(2.02)		5.11 (2.3)	
Child age (**3-5 years**)	-1.25	-0.11 (0.63)*	-1.00	-0.09 (0.62)	-0.99	-0.09 (0.62)
Child gender (**Boy**)	0.64	0.06 (0.63)	0.57	0.05 (0.62)	0.57	0.05 (0.62)
Race of child (**Non-African American**)	0.30	0.01 (1.44)	0.32	0.01 (1.41)	0.41	0.02 (1.42)
Daily stress in the past month			-0.01	-0.01 (0.11)	0.00	-0.01 (0.12)
Daily asthma stress in the past month			0.31	0.22 (0.09)*	0.32	0.22 (0.09)*
Smoking practices (**No**)					-0.35	-0.03 (0.66)
Caregivers educational level (**College or higher**)					0.16	0.01 (0.71)
Current working status (**No**)					0.47	0.04 (0.65)

Dependent variable: Number of symptom days past 14 days
** = p<.001
**= p <.005

Results of Multiple Linear Regression with Number of Symptoms Nights Past 14 Days as a Dependent Variable

Variables	Model 1		Model 2		Model 3	
	B	β (SE β)	*B*	β (SE β)	*B*	β (SE β)
Constant	5.64 (2.04)		3.64 (2.14)		3.14 (2.43)	
Child age (**3-5 years**)	-0.56	-0.05 (0.662)	-0.28	-0.024 (0.651)	-0.24	-0.021 (0.659)
Child gender (**Boys**)	1.04	0.092 (0.667)	0.97	0.086 (0.653)	0.98	0.086 (0.655)
Race of child (**Non-African American**)	0.26	0.01 (1.523)	0.27	0.01 (1.489)	0.29	0.011 (1.505)
Daily stress in the past month			-0.03	-0.008 (0.1202)	-0.01	-0.002 (0.1214)
Daily asthma stress in the past month			0.34	0.23 (0.095)*	0.35	0.231 (0.095)*
Smoking practices (**No**)					-0.54	-0.046 (0.698)
Caregivers educational level (**College or higher**)					0.27	0.022 (0.745)
Current working status (**No**)					0.22	0.02 (0.683)

Dependent variable: Number of symptom nights past 14 days
** = p<.001
**= p <.005

Discussion & Implications

Parents/Caregivers with children living with severe asthma were more likely to report higher levels of asthma-related stress. Caregivers in this study were also more likely to smoke, less educated & had low income

Several recommendations for pediatric providers can be gleamed from these results

- Refer parents to asthma education programs
- Refer parents who smoke to smoking cessation programs including the national quit line 1-800-QUIT-NOW
- Promote programs that help parents maintain a clean, dust free environment (eg, Healthy Homes, Baltimore)
- Identify indoor environmental exposures that may exacerbate asthma symptoms in young children, especially pre school age children
- For parents with high stress, refer to support groups or counseling

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