

Determinants of Psychosocial Morbidity in Children with Asthma

Madeleine U. Shalowitz, MD, MBA

Laura Curtis, MS

Christopher Lyttle, MA

Lisa K. Sharp, PhD



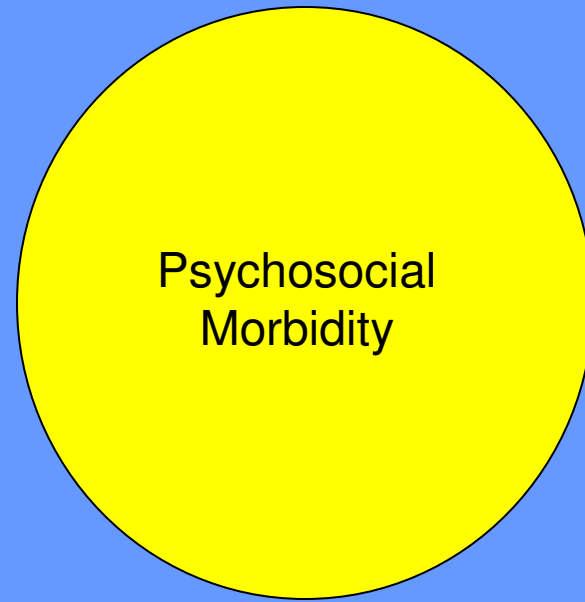
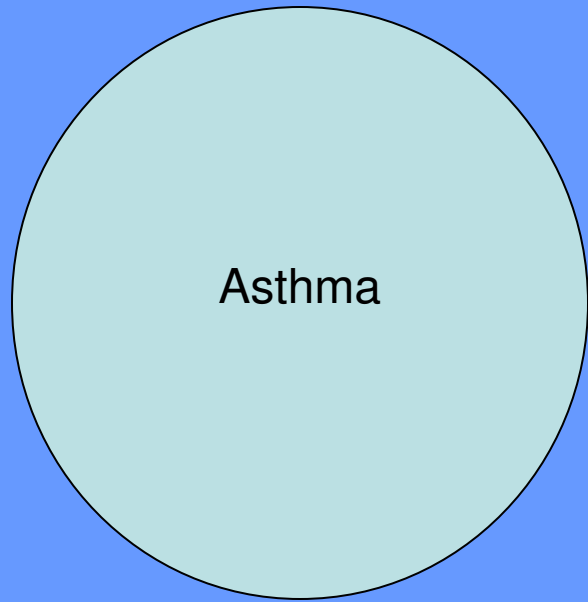
Chicago Initiative to Raise Asthma Health Equity (CHIRAH)

A Longitudinal Study of the Biological, Environmental, Behavioral and Social Factors and their Effects on Asthma Morbidity Over Time in Children and Adults

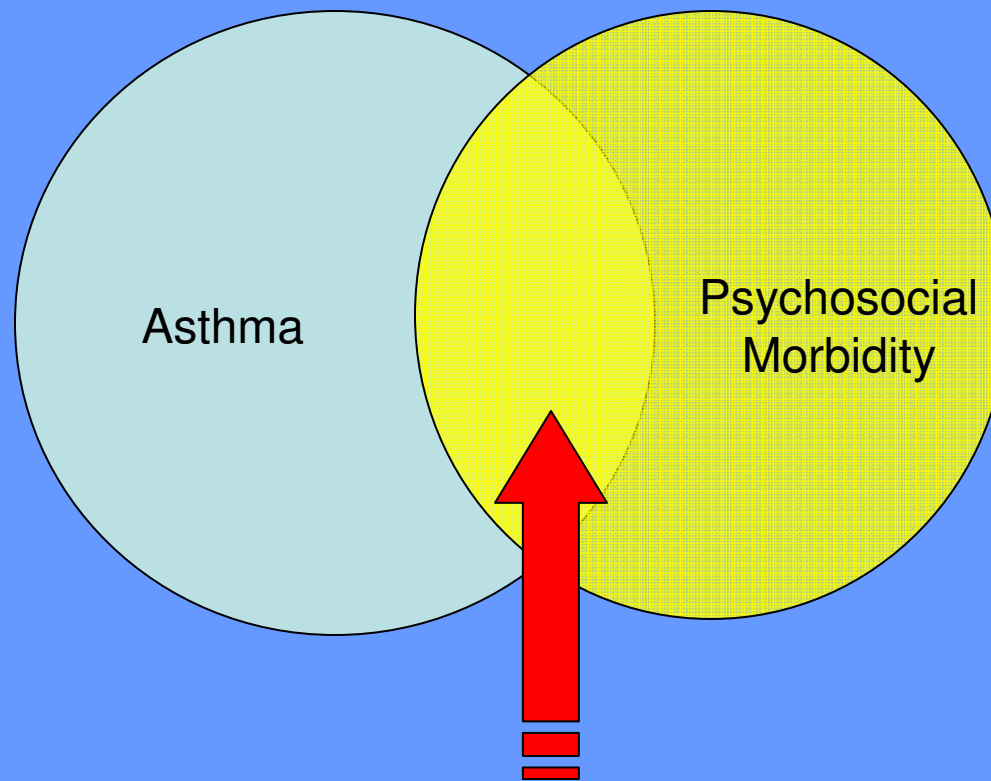
Partnership Between Northwestern University, Feinberg School of Medicine and John H Stroger Hospital of Cook County

Funded by the National Heart, Lung and Blood Institute (NHLBI)

Asthma and Psychosocial Morbidity are Common in School-Aged Children



Asthma and Psychosocial Morbidity are Common in School-Aged Children



Asthma in Children with Psychosocial Morbidity

- Higher levels of parent- and self-reported internalizing problems among children with anxiety and mood disorders who also had asthma

Meuret et al., Depression and Anxiety, 2006

Psychosocial Morbidity in Children with Asthma

- Children with asthma have more behavioral problems than children without asthma
- The relationship for internalizing problems is greater than that for externalizing problems
- Increased asthma severity is associated with more behavioral difficulties

McQuaid *et al.*, Journal of Developmental and Behavioral Pediatrics, 2001

Blackman *et al.*, Journal of Developmental and Behavioral Pediatrics, 2007

Asthma has additional complicating factors related to behavior problems

- Medication effects
- Active illness causing anxiety
- Loss of sleep

Study Question

- What asthma-related characteristics are associated with psychosocial morbidity?

Sample

- Caregiver-child dataset, n=590
- Children 8-14 years old
- All with persistent asthma
- Face-to face interview at time 1
- Cross-Sectional Data
- All information by parent report

Standardized Instruments

- Pediatric Symptom Checklist (PSC): 35 items to “best describe your child”
 - total score and 3 subscale scores: externalizing symptoms, internalizing symptoms, attention
- Center for Epidemiologic Studies-Depression (mother): 20 items about the last 7 days

PSC: Jellinek, <http://www.massgeneral.org/allpsych/PediatricSymptomChecklist>

Stoppelbein et al. Journal of Developmental and Behavioral Pediatrics, 2005

CESD:Radloff, 1977

Asthma Control (NAEPP Guidelines)

- Day Symptoms: <4 days in 14 indicates good control
- Night Symptoms: <2 days in 14 indicates good control

Caregiver Characteristics

- Half had household income <\$30,000 (20%<\$15K, 33%>\$50K)
- One quarter had high school education or less (13%<HS, 19% BA or more)
- 36% had very good or excellent health (41% good, 23% fair or poor)
- Average depression score 14, (range 0-55)

Child Characteristics

- Age 10.5 years (S.D. 1.8)
- Gender 59% male
- 25% Hispanic; 58% African American

Child Characteristics

- 50% had excellent or very good health (15% poor health)
- 65% had fewer than 4 days in 14 with asthma symptoms
- 60% had fewer than 2 nights in 14 with asthma symptoms
- 29% scored above the PSC cut-off indicating a need for further evaluation

Child Characteristics

- 33% used an inhaled β -agonist in the prior 14 days
- 41% used an inhaled corticosteroid at least one day in the prior 14 days
- 31% did not receive an oral steroid burst in the prior year

Asthma Control and Psychosocial Morbidity

		Internalizing Range (0-20)	Externalizing Range (0-18)	Attention Range (0-16)
General health	Excellent	4.4 (3.7, 5.1)***	4.2(3.3, 5.1)**	4.7(3.8, 5.6)***
	Very good	5.7 (5.2, 6.3)	5.0(4.5, 5.5)	5.4(4.9, 6.0)
	Good	6.6 (6.0, 7.2)	5.3(4.8, 5.9)	5.8(5.2, 6.3)
	Fair/poor	7.7 (6.8, 8.6)	6.2(5.2, 7.1)	6.9(6.1, 7.8)
Symptom days	<4/14	6.0 (5.4, 6.4)	5.0(4.6, 5.4)	5.5(5.1, 5.8)
	≥4/14	6.5 (6.0, 7.1)	5.6(5.1, 6.1)	6.1(5.5, 6.7)
Symptom nights	<2/14	5.7 (5.3, 6.1)**	4.9(4.5, 5.3)*	5.3(4.9, 5.7)*
	≥2/14	6.8 (6.3, 7.4)	5.7(5.2, 6.2)	6.2(5.6, 6.7)
Steroid burst	0/12 mos	5.8 (5.2, 6.3)	5.1(4.5, 5.6)	5.1(4.5, 5.7)*

Chi-square and F statistics reported by PSC factors *p<.05, **p<.01, ***p<.001

Being in excellent health and having asthma symptoms fewer than 2 nights in 14 is associated with fewer behavior problems.

Psychosocial Morbidity and Caregiver Characteristics

		Internalizing Range (0-20)	Externalizing Range (0-18)	Attention Range (0-16)
Caregiver Characteristics				
Income	<\$15,000	6.1 (5.3, 6.9)	5.6(4.9, 6.4)**	6.0(5.2, 6.7)**
	\$15,000-\$30,000	6.6 (5.9, 7.3)	6.0(5.3, 6.7)	6.3(5.7, 7.0)
	\$30,000-\$50,000	6.0 (5.2, 6.8)	4.8(4.1, 5.6)	5.4(4.7, 6.1)
	>\$50,000	5.9 (5.4, 6.5)	4.5(4.0, 5.0)	5.1(4.6, 5.7)
Education	< HS	6.7 (5.6, 7.8)	6.4(5.4, 7.5)**	6.7(5.8, 7.6)**
	HS/GED	6.2(5.5, 6.9)	5.4(4.8, 6.1)	5.8(5.2, 6.4)
	Some college	6.0(5.5, 6.5)	5.1(4.6, 5.6)	5.8(5.2, 6.3)
	BA or higher	6.0 (5.3, 6.7)	4.4(3.7, 5.0)	4.7(4.0, 5.4)
General Health	Excellent	4.7 (3.7, 5.7)***	4.5(3.5, 5.5)***	4.8(3.8, 5.8)***
	Very good	5.2 (4.6, 5.8)	4.4(3.8, 4.9)	4.9(4.3, 5.5)
	Good	6.4 (5.9, 6.9)	5.4(4.9, 6.0)	5.8(5.3, 6.3)
	Fair/poor	7.4 (6.6, 8.2)	6.0(5.3, 6.8)	6.6(5.9, 7.4)
Depression score		$\rho = .35^{***}$	$\rho = .25^{***}$	$\rho = .35^{***}$

*p<.05, **p<.01, ***p<.001

Better caregiver health is associated with less psychosocial morbidity. Lower income and less caregiver formal education is associated with more externalizing and attention symptoms. Note the moderate correlation with caregiver depressive symptoms

Predicting Behavior Symptoms

	Total PSC Score
	β (SE)
Day Symptoms >4/14	
Night Symptoms >2/14	2.5 (1.05)*
Child Health(good)	2.9 (1.4)*
(fair)	4.6 (1.5)**
(poor)	6.3 (1.8)***
Child Age	
Child Sex	2.1 (0.9)*
Hispanic	
Black	
Caregiver Depression	0.4 (0.04)***

*p<.05; **p<.01; ***p<.001

Income, Education, Steroid and β -agonist use are not significant in any of the analyses

Night symptoms, worse general health, and being a boy are associated with more psychosocial morbidity controlling for the race/ethnicity, child age and the large influence of caregiver depression symptoms

Predicting Behavior Symptoms *continued*

	Total PSC Score	Externalizing Behaviors
	β (SE)	β (SE)
Day Symptoms >4/14		
Night Symptoms >2/14	2.5 (1.05)*	
Child Health(good)	2.9 (1.4)*	
(fair)	4.6 (1.5)**	
(poor)	6.3 (1.8)***	
Child Age		
Child Sex	2.1 (0.9)*	0.9 (0.3)**
Hispanic		
Black		
Caregiver Depression	0.4 (0.04)***	0.1 (0.02)***

*p<.05; **p<.01; ***p<.001

Income, Education, Steroid and β -agonist use are not significant in any of the analyses

Externalizing symptoms are more common in boys, controlling for race-ethnicity, child age and a smaller, but significant influence of caregiver depression symptoms

Predicting Behavior Symptoms *continued*

	Total PSC Score	Externalizing Behaviors	Internalizing Behaviors
	β (SE)	β (SE)	β (SE)
Day Symptoms >4/14			
Night Symptoms >2/14	2.5 (1.05)*		1.0 (0.4)**
Child Health(good)	2.9 (1.4)*		1.3 (0.5)*
(fair)	4.6 (1.5)**		2.2 (0.5)***
(poor)	6.3 (1.8)***		2.6 (0.6)***
Child Age			0.2 (0.1)*
Child Sex	2.1 (0.9)*	0.9 (0.3)**	
Hispanic			
Black			-1.7 (0.5)***
Caregiver Depression	0.4 (0.04)***	0.1 (0.02)***	0.1 (0)***

*p<.05; **p<.01; ***p<.001

Income, Education, Steroid and β -agonist use are not significant in any of the analyses

Night symptoms and worse general health are associated with more internalizing symptoms controlling for the race/ethnicity, child age and the influence of caregiver depression symptoms. Note that African Americans endorsed fewer internalizing symptoms.

Predicting Behavior Symptoms, *continued*

	Total PSC Score	Externalizing Behaviors	Internalizing Behaviors	Attention
	β (SE)	β (SE)	β (SE)	β (SE)
Day Symptoms >4/14				
Night Symptoms >2/14	2.5 (1.05)*		1.0 (0.4)**	
Child Health(good)	2.9 (1.4)*		1.3 (0.5) *	
(fair)	4.6 (1.5)**		2.2 (0.5) ***	
(poor)	6.3 (1.8)***		2.6 (0.6)***	
Child Age			0.2 (0.1) *	
Child Sex	2.1 (0.9)*	0.9 (0.3)**		1.3 (0.3)***
Hispanic				
Black			-1.7 (0.5) ***	
Caregiver Depression	0.4 (0.04)***	0.1 (0.02)***	0.1 (0) ***	0.1 (0.02)***

*p<.05; **p<.01; ***p<.001

Income, Education, Steroid and β -agonist use are not significant in any of the analyses

Attention symptoms are more common in boys, controlling for race-ethnicity, child age and the influence of caregiver depression symptoms

Conclusions

- Only internalizing symptoms were associated with night symptoms and worse overall child health
- No effect of medication use on psychosocial morbidity was apparent
- No effect of household income or maternal education was apparent

Methodological Note

- The caregiver's own symptoms of depression affected her ratings of her child's psychosocial morbidity
- Most parent-report questionnaire studies do not control for the influence of the parent's state of health, mental or physical, on their responses about their children
- Those effects may not be small

Methodological Note, continued

- African American children had lower internalizing symptom scores
- Is this a real difference, or another artifact of reporting?

Future Studies

- Longitudinal work should address the pathway(s) by which asthma morbidity and psychosocial morbidity are interrelated
- Independent observation will be necessary to verify both asthma morbidity and psychosocial morbidity
- Be careful to understand the context of parent-report studies in particular, and questionnaire-based studies in general

Acknowledgements

- The CHIRAH Team at Northwestern and Stroger Hospital of Cook County
 - Kevin B Weiss, MD, MPH- co-PI
 - John J Shannon, MD- co-PI
- The families who participated
- The Chicago Public Schools

