



Letter

Black and Hispanic perceptions of asthma medication in the School Inner-City Asthma Study

Racial and ethnic minorities suffer a disproportionate rate of asthma morbidity.¹ We aimed to determine racial and ethnic differences in the perception of asthma medications of caregivers of black vs Hispanic school children enrolled in the School Inner-City Asthma Study. Furthermore, we investigated whether these beliefs were associated with asthma morbidity.

The School Inner-City Asthma Study is a prospective, observational study of home and school environments related to asthma morbidity in inner-city school children.² Questionnaires completed by caregivers of enrolled students with asthma elicited self-identified race and ethnicity, perception of asthma control, attitudes toward asthma medications, and asthma symptoms. Analysis was limited to black and Hispanic subjects because fewer than 5% of participants were white. The study was approved by the Boston Children's Hospital investigational review board. Subject assent and parental consent were obtained for all subjects before enrollment.

Univariate analysis examined the associations of race and ethnicity on reported asthma control (4-week recall), belief that asthma medications can be effective, belief the child receives too much medication, worry about side effects, reports that medications “do not really work,” use of alternative remedies, and modification of drug therapy owing to these concerns. Multivariate models evaluated the perception of asthma control and medication attitudes with race if the univariate *P* value was less than or equal to .05 and adjusting for age, sex, and potential sociodemographic characteristics if associated with the outcome (*P* < .2) and confounding to the main effect.

Quantitative assessment of asthma morbidity was measured as the maximum number of asthma symptom days,² defined as the largest of the following variables in the 2 weeks before the baseline survey: (1) daytime wheezing, chest tightness, or cough; (2) days

on which child had to slow down or discontinue play activities owing to wheezing, chest tightness, or cough; and (3) nights with wheezing, chest tightness, or cough leading to disturbed sleep. Associations between attitudes toward medication and asthma morbidity were tested by the Wilcoxon rank-sum test.

Race was reported by 268 subjects: 15 (4%) white, 120 (34%) black, 133 (38%) Hispanic, and 83 (31%) mixed or other. The average age was 7.8 years, and 46% were girls. There was no difference in perception of asthma control between blacks and Hispanics. However, caregivers of Hispanic children were 4.9 times as likely to report the child was on too much medication compared with caregivers of black children. Furthermore, Hispanic caregivers tended to be less confident medications could control the child's asthma and were more likely to worry about side effects, report medications did not work, use alternative remedies, and cut back on asthma medications for these concerns (Table 1). After adjusting for age, sex, and caregiver education, Hispanics remained significantly more likely to believe the child was taking too much medication (odds ratio 4.9, 95% confidence interval 1.7–14.0, *P* = .003).

Negative perceptions of asthma medications were significantly associated with more asthma symptom days. Report of “child gets too much medication” was associated with more asthma symptom days (median 4 days, interquartile range [IQR] 2,7, vs 1 day, IQR 0,3, *P* < .001), as were worry about side effects (median 3 days, IQR 0,5, vs 1 day, IQR 0,3, *P* = .005) and believing the drugs were not effective (median 3 days, IQR 0,5, vs 1 day, IQR 0,3, *P* = .007). There was no difference in asthma symptoms by alternative remedy use (median 2, IQR 0,4, vs 1, IQR 0,4, *P* = .4).

We found that caregivers of Hispanic children were almost 5 times as likely to be concerned their child took too much medicine and that medication concerns were strongly and consistently associated with poor asthma control. Although race, medication perception, and asthma control have been described separately, this study found the associations of Hispanic ethnicity, negative medication beliefs, and increased asthma symptoms within the same carefully studied cohort of inner-city school children with asthma.

Our findings are consistent with prior studies reporting lower expectations and greater worry about minority children's asthma,³ particularly Hispanic caregivers' heightened concern over medication use.³ Hispanic ethnicity was associated with the belief that the child receives too much medication independent of caregiver education, income, or Medicaid status, suggesting racial and ethnic identification is the key influence on attitudes. These findings support that underuse of controller medication by minority populations is independent of sociodemographic factors.^{4,5} Medication concerns could be a key modifiable risk factor for suboptimal

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Table 1
Racial and ethnic differences in caregiver perception of asthma and asthma medications

Caregiver-reported perception of asthma medications	Hispanic, % (n)	Black, % (n)	OR	95% CI	P value ^a
Rates asthma as well controlled	73 (94)	76 (91)	0.9	0.5–1.6	.7
Believes asthma drugs can be effective	89 (106)	95 (108)	0.5	0.1–1.3	.2
Believes child receives too much medicine	17 (20)	5 (5)	4.1	1.4–14.7	.005
Worries about side effects	26 (34)	18 (21)	1.6	0.8–3.2	.1
Of those, cut back on the medicine because of concern of side effects	53 (19)	43 (9)	1.5	0.4–5.1	.6
Believes the medicine does not work	22 (25)	16 (17)	1.5	0.7–3.2	.3
Of those, stopped giving the medicine because they believed the medicine was not working	25 (6)	18 (3)	1.5	0.3–11.2	.7
Used alternative therapies during past 3 mo	21 (28)	13 (16)	1.7	0.8–3.6	.1
Of those, used alternative therapies <i>instead</i> of prescribed medicine	33 (9)	25 (4)	1.5	0.3–8.2	.7

Abbreviations: CI, confidence interval; OR, odds ratio.

^aBy Fisher exact test.

controller medication use⁶ because they directly influence adherence⁷ and could be the target of counseling interventions to improve outcomes.

In addition, we found that negative beliefs linked to medication were associated with poor asthma control. Parental concern over medications can lead to poor adherence⁸ and thereby control,⁹ although similar findings have been found independent of adherence.¹⁰ In this context, the causal relation might be bidirectional—parents of symptomatic children might have less confidence in the benefit-to-risk ratio of prescribed medications. This bears further investigation.

Despite standardization of asthma care and efforts to improve minority access to health care, racial, ethnic, and cultural disparities in asthma persist.¹ The present findings highlight the racial and ethnic differences in the perception of asthma medication and the effect of negative medication perceptions on asthma control.

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