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Beliefs and Barriers to Medication Use in Parents of Latino Children With Asthma

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Summary

Objective—Disparities in asthma outcomes exist between Latino and non-Latino white (NLW) children. We examined rates of medication use, medication beliefs, and perceived barriers to obtaining medication in US and island Puerto Rican parents of children with asthma

Hypotheses—Island PR parents would report the lowest rates of controller medication use, followed by RI Latino and RI NLW parents; Latino parents would report more medication concerns than NLW parents; and Island PR parents would report the most barriers to medication use.

Study Design—Five hundred thirty families of children with persistent asthma participated, including 231 Island PR, 111 RI NLW, and 188 RI Latino. Parents completed survey measures.

Results—Group differences were found on reported use of ICS ($X^2 = 50.96$, $P < 0.001$), any controller medication ($X^2 = 56.49$, $P < 0.001$), and oral steroids ($X^2 = 10.87$, $P < 0.01$). Island PR parents reported a greater frequency of barriers to medication use than the other two groups ($X^2 = 61.13$, $P < 0.001$). Latino parents in both sites expressed more medication concerns than NLW parents ($F = 20.18$, $P < 0.001$). Medication necessity was associated with ICS use in all three groups (all P 's < 0.01). Medication concerns were positively associated with ICS use in PR only (OR = 1.64, $P < 0.05$).

Conclusions—Differences in medication beliefs and the ability to obtain medications may explain the reported disparity in controller medication use. Further studies are needed to evaluate these obstacles to medication use.

Keywords

disparities; adherence; asthma; ethnicity; childhood; medication use

INTRODUCTION

Research has indicated that among minorities, mainland and island Puerto Ricans consistently emerge as having high lifetime asthma prevalence (up to 20% in the mainland and 34% in the island), compared to other groups in the United States.¹⁻³ Both mainland and island Puerto Rican children also have poor asthma outcomes compared to children from other demographic groups.^{3,4} Dominican children who reside on the mainland also experience high rates of asthma prevalence and morbidity.⁵ Differences in prevalence and morbidity rates among Latino ethnic subgroups are likely determined by a complex set of factors; however, few studies have examined potential contributing factors for disparities in asthma outcomes by place of residence (e.g., island vs. mainland) and across groups of Latino children who remain the most at risk for poor asthma outcomes.

Population based surveys indicate that underuse of controller medications may be a important problem for Latino children with asthma. In one study, less than a fourth of Latino children with moderate to severe asthma filled prescriptions for controller medications³ and the rate of controller medication use was significantly lower than reported by non-Latino white caregivers even after adjusting for socio-demographic variables and asthma severity, a finding consistent with other existing research.^{6,7} The reasons for this low rate of medication use are complex and likely involve issues at the level of the family, provider, and health care system.

Parents may perceive many personal barriers to filling medications, such as cost, or difficulty getting to the pharmacy due to problems in transportation. Additionally, personal beliefs such as a preference for the use of alternative medications may affect not only timing of medication use (e.g., beginning with natural remedies before progressing to prescribed medications),⁸ but also whether parents choose to fill prescriptions at all.

Research from the patient and family perspective indicates that many parents have concerns about the use of controller medications that may affect their acceptability as regular treatment. Common concerns include worries about potential long-term complications,^{9,10} fear of dependence,⁹ and general concerns about side effects.¹¹ There is also some evidence that beliefs about asthma medications differ by racial/ethnic background, and these beliefs may relate to patterns of medication use. One recent survey study of parents of children with asthma¹² indicated that relative to nonminority parents, minority parents' concerns about medication more frequently outweighed belief in the necessity of medication. Moreover, higher ratings of necessity (relative to concern) were associated with better self-reported medication adherence. Another recent study showed that both negative medication beliefs and minority status (African American and Latino) were associated with nonadherence to inhaled ICS among adults.¹³

To date, few studies have evaluated potential explanations for underuse of controller medication among Latinos. The purpose of this study was to evaluate rates of reported medication use (i.e., whether or not the child was using controller medications), beliefs about medications, and perceived barriers to medication use in three groups of parents of children with asthma: (1) island Puerto Rican, (2) mainland Latino (both Dominican and Puerto Rican in Rhode Island), and (3) non-Latino white (NLW) in RI. It was expected that island Puerto Rican parents would report the lowest levels of controller medication use compared to the mainland Latino and NLW groups. Among the mainland parents, it was expected that Latino parents would report lower rates of controller medication use than NLW parents, and that island Puerto Rican parents would report greater barriers to filling prescriptions for asthma medications. It was also expected that Latino parents (both island and mainland) would express greater concern and less belief in the necessity of asthma

medications than NLW parents. Lastly, it was expected that, for all groups, medication beliefs would be associated with reported controller medication use.

METHODS

Participants

Our original dataset consisted of 655 caregivers of 786 children with asthma. Given our central question involved parental attitudes toward controller medications, we excluded children whose asthma had been classified as “mild intermittent.” Extensive discussion of the asthma severity classification¹⁴ and characteristics of our sample¹⁵ are reviewed elsewhere. For caregivers who had reported on more than one child, we selected as our “target child” the one who was first to attend the research session, resulting in a dataset of 530 parent–child dyads (Fig. 1). Our final data set included 231 island PR parents, 111 non-Latino white parents in RI, and 188 Latino parents in RI.

The large majority of caregivers were biological mothers (94.2%) with a small proportion of biological fathers (2.3%) and other female relatives (3.3%); therefore, caregivers are referred to as “parent” in this article. Of Latino parents in RI, 45.7% (86) were of Puerto Rican origin, and 54.3% (102) were of Dominican origin. Children’s age ranged from 7 to 16 years (mean age = 10.5 years), and 41.3% of the children were female. In PR, 62.3% of families qualified as being below the federally defined guidelines for poverty. In RI, 41.8% of families met this criterion, which represented a significantly lower proportion ($X^2 = 21.98$, $P < 0.001$) compared to island PR families, however this proportion differed by ethnicity ($X^2 = 50.92$, $P < 0.001$), with the majority (57.4%) of RI Latino parents, and a much smaller proportion (15.3%) of RI NLW parents reporting income below the poverty threshold.

Procedures

Data collection took place as part of a larger study investigating asthma disparities between NLW children in RI and Latino children in RI and Puerto Rico. The methods of the larger study have been described in detail elsewhere.¹⁵ Briefly, families were recruited from primary care clinics, cultural events, and community educational programs. Participating children had physician-diagnosed asthma that was confirmed through medical history, physical examination, and lung function testing.

Written parent consent and child assent were obtained in accordance with institutional review board guidelines at both participating institutions (RI Hospital and University of Puerto Rico). The study included four separate sessions. Data presented here include information regarding medications the child was currently taking and history of oral steroid use in past year, collected at a second study visit (when medical history, physical exam, and clinician severity classification occurred), and self-report measures regarding parental medication beliefs and barriers to filling prescriptions, which were collected at a later study visit.

Measures

Poverty Threshold—An income-to needs ratio was calculated for each family by dividing yearly household family income by the poverty threshold for that family size.^{16,17} A family was considered at or below the poverty line if the ratio was less than or equal to 1.0 during year of study participation.

Asthma Severity

After medical history, physical examination, and pulmonary function testing, a study clinician provided an assessment of asthma severity utilizing a visual worksheet. This worksheet classified severity based on reported symptom frequency, pre-albuterol FEV₁, and current controller medication dose. The worksheet was derived from both Global Initiative for Asthma (GINA) and NAEPP guidelines, and has been described in detail elsewhere.¹⁴ Severity was initially classified as “mild intermittent,” “mild persistent,” “moderate persistent,” and “severe persistent.” Given that we excluded all cases with “mild intermittent” asthma, our final data set included parents of 187 (35.3%) children with mild persistent asthma, 208 (39.2%) children with moderate persistent asthma, and 135 (25.5%) children with severe asthma.

Current Controller Medication Use—At the second study visit, parents were asked to bring all medications their child was taking for asthma. If they forgot any medications, the research staff systematically queried them regarding currently prescribed medications from an extensive list. Given parents were often unable to recall a medication name, staff were trained to probe regarding medication delivery system (metered-dose inhaler, nebulizer, dry powder inhaler/diskus, oral medication) and color (is it purple?) to identify current prescriptions. Controller medications were classified as (1) inhaled corticosteroids (ICS), including combination ICS/long acting beta agonist (LABA) medications, or (2) any controller (i.e., ICS or non-steroidal controller such as leukotriene modifiers, cromolyn).

Barriers to Filling Prescriptions—Potential barriers to filling prescriptions were assessed by an 8-item list devised for the present study. Items were generated based on a literature review and focus group data regarding adherence barriers in children.¹⁸ Items represented contextual and health care systems barriers such as cost, transportation problems, language barriers, and long wait at the pharmacy, as well as personal barriers such as a preference for alternative medication use. Parents were asked to endorse whether each of these factors had ever *prevented* them from filling the child’s prescription for asthma medication (yes/no).

Beliefs About Asthma Medications—Beliefs about asthma medications were assessed using the Beliefs about Medicine Questionnaire.¹⁹ The BMQ assesses parental concerns and beliefs about the necessity of asthma medications. It comprises two five-item scales assessing beliefs about the *necessity* of medication for controlling illness and *concerns* about taking the medication. Respondents indicate their agreement with each item on a 5-point Likert scale. A necessity-concern differential score (difference between necessity and concern subscales) is also computed as an indication of how parents weigh these beliefs. The BMQ has been used previously in studies of parents of children with asthma.¹² For use with our sample, the BMQ was translated and back-translated into Spanish and reviewed for linguistic appropriateness for both Puerto Rican and Dominican groups. (see Ref. 20 for more details on the method). Internal consistency estimates of necessity and concerns scales are good to excellent for both English ($\alpha = 0.82$ and 0.75 , respectively) and Spanish ($\alpha = 0.82$ and 0.74 , respectively) versions.

Data Analysis

Chi square analyses (with significance of $P < 0.01$) were used to examine potential differences in rates of reported medication use among the three groups; Island PR, RI Latino, and RI NLW. We additionally assessed whether income level (above or below federally defined poverty level) was associated with reported ICS use, use of any controller medication, and history of oral steroids use in the past 12 months. Given the relative income differentials across each of our groups, we conducted these analyses separately within each

of the three main groups (Island PR, RI NLW, RI Latino). Chi square analyses were also used to investigate differences in reported barriers to filling medications among our three groups. ANOVAs with planned comparisons (by site) were used to assess group differences in medication necessity, medication concern, and the necessity/concern differential score. Post-hoc tests (Student–Newman–Keuls) were used to evaluate differences between subgroups (e.g., Island PR vs. RI NLW). Logistic regressions were used to analyze the association between medication beliefs and controller medication use within each of the three demographic groups. Given that predictor variables were continuous, odds ratios were transformed to standard deviation units in order to facilitate intuitively meaningful interpretation.

RESULTS

Rates of Medication Use

We assessed group differences in rates of reported medication use (yes/no) on variables of (1) ICS use, (2) Any controller use (i.e., ICS or nonsteroidal controller medication), and (3) Use of oral steroids in the past 12 months. Overall findings are summarized in Table 1.

Substantial differences in use of ICS were found between groups (Table 1). Subsequent comparisons between each pair of groups revealed that, relative to Island PR parents, RI NLW and RI Latino parents more frequently reported use of ICS (PR vs. RI NLW, $X^2 = 45.77$, $P < 0.001$; PR vs. RI Latino $X^2 = 27.46$, $P < 0.001$). Within the RI sample, NLW parents reported higher rates of ICS use for their children with asthma relative to Latino parents ($X^2 = 4.58$, $P < 0.05$).

Analyses also revealed a significant group difference in parent reported rate of use of any controller medication. Further analyses indicated that this difference was accounted for by the lower rate of controller medication use in PR, which differed significantly from the rates of controller medication use among NLW parents ($X^2 = 37.80$, $P < 0.001$) and RI Latino parents ($X^2 = 38.02$, $P < 0.001$). There were no differences reported between RI NLW and Latino parents (76.6% vs. 71.3%; $X^2 = 1.0$, ns).

Rates of oral steroid use in the past 12 months also differed among the three groups. The highest rate was found among island PR parents, which was significantly higher than rates reported by NLWs ($X^2 = 4.51$, $P < 0.05$) and RI Latinos ($X^2 = 9.91$, $P < 0.01$). There were no differences between RI NLW and RI Latino parents on report of oral steroid use in past 12 months ($X^2 = 0.30$, ns).

Poverty Level and Medication Use

Within the Island PR sample, those above the federally-defined poverty level more frequently reported ICS use ($X^2 = 11.24$, $P < 0.01$) and use of any controller medication ($X^2 = 11.37$, $P < 0.01$) when compared to those below the poverty level. Interestingly, those *above* the federal poverty level also reported more oral steroid use in past 12 months ($X^2 = 9.19$, $P < 0.01$) relative to those below the poverty level, which suggests that higher SES may improve access to all medications, both for daily control and treatment of exacerbations. In RI, being above the poverty level was not associated with any patterns of reported medication use for either the RI NLW or RI Latino groups.

Barriers to Filling Prescriptions

Overall, island PR parents were more likely to report any barrier to filling medications than RI parents ($X^2 = 61.13$, $P < 0.001$), with 54.5% of Island PR parents reporting at least one

barrier to filling prescriptions for asthma medications, compared to 19.8% of RI NLW parents, and 22.9% of RI Latino parents.

Data regarding specific barriers reported are depicted in Table 2. Island PR parents generally reported barriers the most frequently, including medication cost, long pharmacy wait, preference for alternative medications, and worries about side effects. RI Latino parents more frequently endorsed that language barriers interfered with filling prescriptions than the other two groups, although the frequency of reporting this item was low (6.4% among the RI Latino group, vs. 0.9% in PR, and 0.9% in RI NLW). Believing that prior treatments were ineffective, or being treated badly at the pharmacy were endorsed with low frequency, and no differences were observed among groups.

Beliefs About Asthma Medicine

The overall ANOVA for belief in asthma medication *necessity* revealed only a trend for an overall between group difference (Table 3). There was an overall group effect regarding *concerns* about medication use. Post-hoc analyses revealed significant differences between the NLW group and the two Latino groups (RI and Island PR).

The ratio of *necessity* to *concerns* scores differed significantly between groups. Post-hoc analyses indicated significant differences among all three groups, with the island PR group having the lowest necessity-concern score and the RI NLW group having the highest, with the RI Latino group in the middle.

Given all of the children in our sample were classified as having persistent asthma, and many parents at both sites reported no use of ICS, we also assessed whether medication beliefs were associated with ICS use within each group. Results indicate that belief in medication necessity is associated with reported ICS use for all three groups. Medication concerns were positively associated with ICS use, but only statistically significant in the Island PR group. These findings are presented in Table 4.

DISCUSSION

Over a decade of research has provided convincing evidence that prescribing antiinflammatory medications, particularly ICS, yield numerous beneficial effects on asthma morbidity and symptom control for patients with persistent symptoms^{21,22} (see Ref.²³ for a review). There remains, however, a large gap between *recommendations for physician practice* and *parental comfort level* with administering daily medications for control of asthma symptoms. This gap may be particularly critical for Latino families of Caribbean descent, whose children experience higher asthma burden than NLW families.⁵ Additionally, Latino parents on the mainland may encounter language barriers in health care settings that impede effective communication regarding asthma regimens.^{24,25}

Of particular concern, our data reflect that many children with persistent asthma are not taking ICS (the current recommended standard of care for any level of persistent asthma).²⁶ Rates of reported ICS use were particularly low in PR, but also low among Latino children from our mainland sample relative to the NLWs. Reported use of any controller medication was also particularly low among the Island PR sample. We were not able to assess whether these low rates of controller medication use were due to differential prescription patterns, or whether Latino parents (both on the Island and mainland) chose not to fill controller medications (or ICS in particular), more frequently than NLW parents. Additionally, we did not have access to actual claims data regarding medication refills, which might yield information regarding patterns of medication use by insurance type.

Our data indicate that Puerto Rican parents on the island do report more barriers to filling prescriptions for asthma medication than NLW and Latino parents on the U.S. mainland. This finding may reflect differences in health care systems and practices between the two sites. Our mainland site, Rhode Island, is regularly rated as being among the top ten states in terms of overall insurance coverage for children, including children on Medicaid. The fact that RI's Medicaid managed care program, RItE care, approaches commercial insurance and permits almost all children to have coverage may explain why poverty was not associated with controller medication use for RI Latinos, as well as the overall low rate of instrumental barriers to filling prescriptions in Rhode Island. By comparison, in Puerto Rico the Health Department has established a policy where the medication costs for Medicaid patients are contained within the capitation given to the provider organizations who manage the patients. This arrangement may pass financial risk for treatment cost down to primary care provider groups, and, as a result, introduce a financial barrier to prescribing medications.

Interestingly, although Latino parents on the mainland had high scores regarding the necessity of asthma medication for their children's health, Latino parents in both sites (RI and Island PR) expressed higher levels of concern regarding asthma medication use. These findings may reflect underlying cultural concerns regarding the use of daily medications for asthma, and a preference for natural remedies, which is consistent with prior research in this area.^{27,28} Cultural beliefs and the use of home remedies can delay timely treatment, because individuals may use home remedies as an initial response to symptoms prior to initiating prescribed medications. In the case of asthma, this delay may cause symptoms to progress and become more severe.

Belief in the necessity of medication was associated with reported ICS use in all three groups, suggesting that parents whose children were taking ICS were also more likely to express belief in the medicine's important role in asthma management. Concerns about medications were positively associated with ICS use, but only in the Island PR group, and at a modest ($P < 0.05$) level. Given our data are cross-sectional, it is possible that this finding reflects increased concern about use of ICS once the medication is prescribed.

A few key study limitations bear mention. Our study was not a population-based survey, hence our findings may not be representative, even within our own locales. Population-based approaches, however, must rely on parental reports to classify disease states, where our clinical study design allowed full asthma severity classification by a clinician, which included findings from physical exam and prebronchodilator spirometry. Our data are cross-sectional and, as a result, we can only speculate regarding the causal links among our variables. Further, we did not query parents regarding their beliefs about specific medication types; hence, our data reflect general beliefs about asthma medications, and not beliefs regarding specific medications (ICS, controllers in general, or quick-relief medications). Additionally, we did not directly assess whether physicians prescribed controller medications, or if parents did not fill these medications when prescribed. Most studies that have compared physician prescription practices based on medical chart review with pharmacy claims data (indicating actual prescription fill) have found that around 21% of asthma patients²⁹ to 30% of caregivers of children with persistent asthma³⁰ do not fill prescriptions when they are prescribed. Conversely, there is evidence that physicians do not always prescribe controller medications, particularly for minority children, even when there are significant symptoms of asthma.^{31,32} These patterns may be influenced by policies specific to each health care system or insurance plan, as noted above.

Despite these limitations, our findings provide evidence that ethnicity is associated with certain cultural beliefs and concerns about asthma medications. Lack of belief in the necessity of medications may be an important factor in medication underuse. Improved

medication treatment could be facilitated if physicians are trained to be aware and inquire about the caregiver's beliefs and medication preferences. Additionally, our results suggest that financial barriers may play an important role in preventing access to medication in PR. Further research is needed to identify the underlying barriers to medication use among Latinos, including qualitative data regarding physician–family interactions, investigations of decision making regarding medication use among diverse patient groups, and systematic analysis of health care system structure.

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Fig. 1.
Participant selection.

TABLE 1

Rates of Reported Medication Use

	Island PR (%)	RI Latino (%)	RI NLW (%)	Overall χ^2
Inhaled corticosteroid (ICS)	21.6	45.7	58.7	50.96**
Any controller medication	41.1	71.3	76.6	56.49**
Oral steroid use, past 12 months	57.8	42.2	45.5	10.87*

* $P < 0.01$.

** $P < 0.001$.

TABLE 2**Barriers to Filling Prescriptions**

	Island PR (%)	RI Latino (%)	RI NLW (%)	Overall χ^2
Cost of medication	32.5	8.2	8.0	50.99**
Transportation	3.9	6.3	1.8	3.68
Language barriers	0.9	6.4	0.9	13.32**
Long wait at pharmacy	18.6	6.9	1.8	26.43**
Concerned about side effects	32.9	5.8	5.5	66.43**
Prefer alternative treatments	16.5	6.4	2.7	19.84**
At least 1 barrier experienced	54.5	22.9	19.8	61.13**

**
 $P < 0.001$.

TABLE 3

Beliefs About Asthma Medicine

	Island PR ^a , mean (95% CI)	RI Latino ^b , mean (95% CI)	RI NLW ^c , mean (95% CI)	Overall F	Post-hoc comparisons
Necessity	3.47 (3.35, 3.59)	3.61 (3.50, 3.72)	3.68 (3.58, 3.82)	2.78	ns
Concerns	3.25 (3.15, 3.36)	3.16 (3.03, 3.28)	2.67 (2.54, 2.81)	20.18***	a > b, c *
Necessity—concerns	0.35 (0.24, 0.45)	0.58 (4.6, 0.69)	1.10 (0.92, 1.28)	29.43***	a < b < c **

* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

TABLE 4

Logistic Regressions Predicting ICS Use From Medication Beliefs

	Island PR OR (95% CI)	RI Latino OR (95% CI)	RI NLWOR (95% CI)
Necessity	1.86 (1.74, 1.98) **	1.99 (1.88, 2.10) **	2.71 (2.58, 2.84) **
Concern	1.64 (1.54, 1.74) *	1.19 (1.07, 1.31)	1.17 (1.04, 1.30)

Odds ratios were transformed to standard deviation units, therefore CI not including “1” is NOT equivalent to significance test.

* $P < 0.05$.

** $P < 0.01$.