Medication Identification Among Caregivers of Urban Children With Asthma

Sean M. Frey, MD; Maria Fagnano, MPH; Jill Halterman, MD, MPH

From the Department of Pediatrics, University of Rochester School of Medicine and Dentistry, Rochester, NY
The authors have no conflicts of interest to disclose.
Address correspondence to Sean M. Frey, MD, Department of Pediatrics, University of Rochester Medical Center, 601 Elmwood Ave, Box 777, Rochester, NY 14642 (e-mail: Sean_Frey@urmc.rochester.edu).
Received for publication January 18, 2016; accepted April 14, 2016.

ABSTRACT

OBJECTIVE: To determine caregiver ability to name their child's inhaled asthma medications, and examine whether perceived ease of remembering names is associated with accurate naming and asthma outcomes.

METHODS: As part of the School-Based Telemedicine-Enhanced Asthma Management trial in Rochester, New York, we asked caregivers of children with persistent asthma to: 1) name their child's inhaled medications, and 2) indicate agreement with the statement, "it is easy to remember the names of my child's asthma medications." We limited analyses to subjects with 1 inhaled medication. Reported names were compared with canisters available during a home visit; complete matches were considered concordant. We compared ease of remembering names with concordance, asthma symptoms, and adherence using bivariate and multivariate analyses.

RESULTS: Overall, 141 caregivers (87%) had children with 1 inhaled medication (62% black race, 68% Medicaid). Most (74%) perceived it easy to remember medication names, yet only 46% reported names concordant with medications at home. Caregivers who did not easily remember medication names were less likely to concordantly name available medications (23% vs 54%; $P = .002$), and more likely to report that their child experienced >2 symptom days per week (33% vs 16%; $P = .03$), >2 symptom nights per month (31% vs 12%; $P = .02$), and missed >1 dose(s) of preventive medication in the previous 2 weeks (52% vs 28%; $P = .03$). Findings were consistent in multivariate regression analyses.

CONCLUSIONS: Caregivers of urban children with persistent asthma who considered medication names difficult to remember were less able to accurately name available medications, and reported worse control and medication adherence. Greater attention to medication identification might improve outcomes in this population.

KEYWORDS: adherence; asthma; childhood; prevention; primary care

ACADEMIC PEDIATRICS 2016;16:799–805

WHAT'S NEW

Suboptimal adherence with inhaled preventive medications is a significant contributor to pediatric asthma morbidity in the United States. A caregiver-perceived inability to identify medications by name might act as a barrier to adherence and disease control.

ASTHMA CONTINUES TO be the most prevalent chronic disease of childhood, affecting an estimated 7 million children in the United States.[1] Guidelines published by the National Asthma Education and Prevention Program (NAEPP)[2] recommend that all individuals with persistent asthma use a daily preventive medication, such as an inhaled corticosteroid (ICS). Routine use of an ICS improves clinical asthma outcomes.[3–7] Despite this available, effective therapy, the high national rates of asthma-related hospitalization and emergency health care use remain largely stagnant,[1] with only small improvements in morbidity and racial disparities over time.[8] One driver of sustained asthma morbidity is poor adherence with prescribed preventive ICS therapy.

Children with asthma take on average just over half of all prescribed ICS doses, and by late adolescence the adherence rate decreases to 25%.[9] Poor, urban, and minority children are disproportionately burdened by asthma prevalence and morbidity,[1,10–14] and are less likely to adhere to daily preventive therapy when prescribed.[15,16] Although many patient and system factors influence medication adherence,[17–19] one important barrier is the complexity of the medication regimen. Regimens involving inhaled medications and multiple dosing frequencies are difficult for patients to follow.[20] Control of persistent asthma often requires multiple inhaled medications, which might have different drug delivery mechanisms, physical appearances, and indications for use (ie, acute symptom relief vs long-term preventive therapy). This creates an opportunity for confusion and unwitting nonadherence, even among patients with intention to adhere.[21] One aspect of complex medication regimens that has not received adequate attention in the literature is the burden imposed by multiple medication names.

After prescriptions are filled, the model of medication self-management requires patients to be able to "name, identify,

and understand how to take medications."[17] Patients who cannot differentiate available inhaled asthma medications by name might be unable to follow a written asthma action plan. Using a physical attribute to identify medications, such as color rather than name, could potentially introduce additional confusion among patients, caregivers, and providers. This is because inhaled asthma medications in different classes can share the same color: for example, ProAir HFA (Teva Respiratory, LLC, Horsham, PA) and Symbicort HFA (AstraZeneca, London, United Kingdom) are both manufactured with red plastic actuators. Moreover, the same medication might be marketed with different colors: 3 albuterol sulfate hydrofluoroalkane inhalers are currently being manufactured with different actuator colors.

The current pediatric asthma literature does not examine this dynamic. However, the importance of knowing medication names for successful self-management of chronic illness has emerging empirical support, as illustrated by the findings from a pair of recent studies. Among adults with hypertension, the inability to name prescribed antihypertensive medications[22,23] and an overreliance on visual identification of medications[23] were associated with impaired disease control and adverse outcomes. It is unclear whether caregivers of urban children with persistent asthma can readily name available inhaled medications, or whether an inability to name medications affects clinical asthma outcomes. If medication names are a barrier to adherence, such confusion could potentially be elicited by clinicians at the point of care as a risk factor for poor control.

We conducted a study to explore the dynamic of medication name recognition and pediatric asthma outcomes with 2 primary objectives. First, we determined the ability of caregivers to correctly name their child's inhaled asthma medications that were available in the home. Second, we examined whether a caregiver's perceived ability to remember medication names was associated with either correct medication naming or clinical asthma outcomes. The Health Belief Model considers self-efficacy to be important for engaging in health-related behaviors like medication adherence[24]; regardless of objective ability, caregivers who do not perceive themselves as able to name necessary medications might doubt their ability to manage asthma at home. We hypothesized that the caregivers who perceived greater difficulty in naming asthma medications would be less likely to have accurate medication identification, and that their children would experience more disease-related morbidity.

METHODS

SETTINGS AND PARTICIPANTS

The School-Based, Telemedicine Enhanced Asthma Management (SB-TEAM) study is an ongoing, 4-year randomized controlled trial being conducted in urban Rochester, NY. Through a collaboration with the Rochester City School District (RCSD), children randomized into the intervention arm receive: 1) directly observed therapy with preventive medication administered daily under nurse supervision while school is in session, and 2) 3 telemedicine-based asthma follow-up visits with their primary care provider. Children randomized into the enhanced usual care control group have a report of recent symptoms sent to their primary care provider. All caregivers from both arms of the trial are contacted by telephone for 3 bimonthly follow-up surveys over a 6-month period, and each subject receives 2 home visits. The baseline home visit is scheduled after a positive eligibility screen, and randomization of enrolled subjects is performed at that time. A second home visit is conducted at the final follow-up 7 to 9 months after baseline measures are collected. The data for this analysis include all subjects in the second year of the trial and are drawn from the baseline and final home visits, conducted between August 2013 and June 2014.

Screening for eligibility was conducted in partnership with RCSD school nurses and health aides. Children with asthma were identified through preschool and kindergarten health screening forms, school "medical-alert" forms, and lists of students presenting to nursing offices with asthma concerns. An asthma team member contacted each child's caregiver by telephone to confirm eligibility, describe the study, and schedule a baseline home visit for enrollment.

For inclusion into the study, children had to be between 3 and 10 years old, carry a physician diagnosis of asthma, attend a RCSD preschool or elementary school, and have persistent or poorly controlled asthma. Asthma severity and control were determined on the basis of caregiver report of recent symptoms, in accordance with NAEPP guidelines.[2] Children were excluded from participating if their caregiver was unable to speak or understand English, the family had no access to a working phone, the child had participated in a previous asthma study or had another significant medical condition (eg, congenital heart disease, cystic fibrosis, other chronic lung diseases), or if the family planned to leave the school district within 6 months.

Only 1 child per family was eligible for enrollment. Written informed consent was obtained from each caregiver. Verbal assent was obtained from all children aged 7 years and older. Compensation for caregiver time was provided in the form of grocery store gift cards after each telephone follow-up and home visit, with a maximum payment of $130 per subject completing the study. The study protocol was approved by the institutional review board of the University of Rochester.

ASSESSMENT

CAREGIVER ABILITY TO IDENTIFY INHALED ASTHMA MEDICATIONS

As part of the final SB-TEAM home visit, we asked caregivers of children with persistent asthma to name all of their child's inhaled asthma medications. Reported names were documented, and then compared with medication canisters available at the home during the visit. Generic and trade names were both accepted responses, although subject to different interpretation. Caregivers providing a generic name like "albuterol" were considered correct if