Original Article

Mismatching Among Guidelines, Providers, and Parents on Controller Medication Use in Children With Asthma

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What is already known about this topic? Underuse of controller medicines among children with persistent asthma remains widespread despite clear national guidelines and quality measures.

What does this article add to our knowledge? Providers do not recommend that inhaled steroids be used according to national guidelines. Mismatches between parent reports and providers intentions regarding how the child was supposed to use inhaled steroids occurred in half of the children.

How does this study impact current management guidelines? Efforts to increase the use of controller medicines for asthma should focus on ways to align provider decision making with national guidelines and ways to reduce mismatches between parent and provider intentions regarding controller medication use.

BACKGROUND: Underuse of controller medicines among children with asthma remains widespread despite national guidelines.

OBJECTIVES: To (1) assess provider prescribing patterns for asthma controller medications; (2) assess how frequently parents' reports of their child's asthma controller medicine use were mismatched with their provider's recommendations; and (3) evaluate parent attitudes and demographic characteristics associated with these mismatches.

METHODS: In this cross-sectional study, we conducted linked surveys of parents and providers of children with probable persistent asthma in a Medicaid program and 4 commercial health plans in 2011. *Probable persistent asthma* was defined as a diagnosis of asthma and 1 or more controller medication dispensing.

RESULTS: This study included 740 children (mean age, 8.6 years). Providers for 50% of the children reported prescribing controller medications for daily year-round use, 41% for daily use during active asthma months, and 9% for intermittent use for relief. Among parents, 72% knew which class of controller medication the provider prescribed and 49% knew the administration frequency and the medication class. Parents were less likely to report the same controller medication type as the provider, irrespective of dose and frequency, if they were Latino (odds ratio [OR], 0.23; CI, 0.057-0.90), had a household smoker (OR, 2.87; CI, 0.42-19.6), or believed the

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Abbreviations used
ED- emergency department
HPHC- Harvard Pilgrim Health Care
ICS- inhaled corticosteroids
ICS/LABA- inhaled corticosteroids/long-acting beta-agonist
LTRA- leukotriene antagonist
OR- odds ratio

controller medicine was not helping (OR, 0.15; CI, 0.048-0.45).
CONCLUSIONS: Mismatches between parent reports and providers intentions regarding how the child was supposed to use inhaled steroids occurred for half of the children. Efforts should focus on ways to reduce mismatches between parent and provider intentions regarding controller medication use. © **2016 American Academy of Allergy, Asthma & Immunology. (J Allergy Clin Immunol Pract 2016;■:■-■)**

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Controller medicines for asthma such as inhaled corticosteroids (ICS), leukotriene antagonists (LTRAs), or combination ICS-long-acting beta-agonists (ICS/LABAs) improve lung function, decrease the number of asthma-related hospitalizations, reduce emergency department (ED) visits, and limit the use of oral corticosteroids.[1-4] However, despite national guidelines recommending that all children with persistent asthma use an ICS, LTRA, or ICS/LABA,[5] morbidity from asthma remains high. Underuse of controller medicines for persistent asthma is common,[6] and contributes to severe exacerbations, including hospitalizations and ED visits.[7-12]

Underuse of controller medicines may be due to provider underdiagnosis or undertreatment of asthma, parent nonadherence, or misunderstandings by parents of what medicine should be given and how frequently.[13] Designing effective interventions to enhance controller medicine use will require more precise understanding of the relative influences of these possible barriers than is available from current studies. The objectives of this study were to assess (1) provider prescribing patterns of asthma controller medications; (2) how frequently parents' understanding of their children's controller medicine regimen matches their providers' understanding; and (3) parental characteristics associated with a mismatch between parent and provider understanding of the child's medicine regimen.

METHODS

Design and study setting

This was a cross-sectional, linked survey of parents and providers of children with asthma within the Population-Based Effectiveness in Asthma and Lung Diseases Network, a distributed data network that was created for research on lung diseases and built on currently available computerized data sets from the TennCare Medicaid population at Vanderbilt Medical Center and 4 health maintenance organization sites: Harvard Pilgrim Health Care (HPHC), Health Partners Research Foundation, Kaiser Permanente of Georgia, and Kaiser Permanente of Northern California. The study was approved by the institutional review board of each site. This study merges parent-reported data, provider-reported data, and administrative claims data.

Data collection

Computerized medical records or claims data from the 4 health maintenance organizations were used to identify children with asthma and their providers. More specifically, we used computerized data to first identify children with asthma and then located relevant providers either as identified by parents or as indicated in the computerized data.

The target population included parents and providers of members aged 4 to 11 years on January 1, 2011, with 1 or more diagnosis of asthma (*International Classification of Diseases, Ninth Revision, Clinical Modification* code 493.xx) between the years 2004 and 2008, and 1 or more controller medicine dispensed in 2011 (ie, ICS, LTRA, ICS/LABA). We excluded children receiving omalizumab or chronic oral corticosteroids (≥180 continuous days supply) to exclude children with the most severe asthma. We also excluded children with diagnoses of cystic fibrosis, bronchiectasis, pulmonary hypertension, pulmonary embolism, immunodeficiency, hereditary and degenerative diseases, psychoses, and mental retardation.

To identify patients with probable persistent asthma, we intentionally used criteria that erred on the side of inclusiveness because variability in asthma severity might affect adherence to provider recommendations. To ensure that parents and providers of children with persistent asthma were included in the sample, we oversampled for children with asthma with 1 or more asthma-related hospitalization or ED visit in 2011. All results are weighted by the sampling fraction, accounting for the design and nonresponse to represent the target population.

Each participating site administered our surveys to its parent and provider populations on the basis of its own respective institutional review board requirements. As a result of regulations regarding the sharing of personal health information and levels of consent necessary for subject participation, the 4 health maintenance organization Research Network sites used a combination mail and telephone approach for the parent survey, whereas surveys of parents in the TennCare population at Vanderbilt Medical Center were completed in person. Parent surveys were primarily conducted in English, but were also offered in Spanish at the HPHC and Vanderbilt Medical Center.

Surveys were conducted following written informed consent at Vanderbilt Medical Center or verbal informed consent at the other sites. The parent survey consisted of close-ended questions and required approximately 20 minutes to complete. Parents were asked for the name of the child's asthma provider and for permission to contact the provider. Participating parents received a $25 gift card. All the surveys were conducted by the same trained research assistant at Vanderbilt Medical Center.

Provider surveys were administered by mail at the HPHC, Kaiser Permanente of Northern California, and Kaiser Permanente of Georgia sites, whereas providers of the TennCare population completed secure Web-based surveys via Research Electronic Data Capture (REDCap; http://project-redcap.org). The Health Partners Research Foundation offered the provider survey by mail and REDCap. Provider surveys were completed up to 3 months after the parent surveys because we required the parent to provide consent to allow us to contact the provider. The provider survey consisted of a combination of close- and open-ended questions that took approximately 10 minutes to complete. We made a total of 3 attempts to reach the provider by mail. In the survey, we suggested that the provider use the child's medical record to help complete the study.