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Reflection on Education and Clinical Care of Asthma for Lung Longevity (RECALL)

Carlton K.K. Lee, Pharm.D., MPH^{1,2}, Sarah K. Chang, Pharm.D.³, and Arlene M. Butz, ScD, RN¹

¹Department of Pediatrics, Johns Hopkins University, Baltimore, MD

²Department of Pharmacy, The Johns Hopkins Hospital, Baltimore, MD

³CVS Pharmacy, Long Grove, IL

Corresponding Author Information: Carlton K.K. Lee, Pharm.D., MPH, Associate Professor, Pediatrics, Johns Hopkins University, 200 North Wolfe Street, Room 3143, Baltimore, MD 21287, Phone: (410) 614-2949, FAX (410) 367-3166, Email: cleea@jhmi.edu

Abstract

Objective:

Pediatric and adult asthma account for increased healthcare utilization. Preventative measures such as ongoing adherence of preventative medications from childhood to adulthood are essential for positive outcomes. To identify potential challenges for optimal pediatric asthma care, we surveyed adult patients to reflect on their asthma management practices, and education and treatment barriers when they were a child.

Methods:

A descriptive cross sectional survey of specific and open-ended questions in an urban academic medical center. Adult asthmatics (18-30 years old) who participated in a previous pediatric asthma study or received care from the adult emergency department (ED) were enrolled.

Results:

Forty-one adult asthmatic patients (mean (S.D.) age 22.5 (3.5) years and 65.9% females) participated in the survey. Reported childhood asthma related experiences include never attended an asthma education session in almost two-thirds surveyed; their mother or grandmother as the primary person responsible for administering their medications (95.1%); inhaled short-acting beta-agonist (SABA) use information was not helpful (46.3%); wanted to learn more about allergic triggers (78%); and the need for additional asthma educational sessions (48.7%).

Conclusion:

All healthcare providers are encouraged to provide continuous asthma education to their pediatric patients and their family members or guardian.

Key Words: Education, Pediatrics, Prevention, Pharmacotherapy

Introduction

An estimated 25 million people in the U.S. had asthma in 2018 with 5.5 million of those being children aged younger than 17 years of age.¹ Despite lower total numbers, asthmatic children have higher emergency department and inpatient hospitalization visit rates than adults, 74.3 vs. 50.3 per 10,000 population and 10.7 vs. 4.4 per 10,000 population, respectively.¹

Longstanding national and international asthma guidelines recommend daily inhaled corticosteroids (ICS) as the cornerstone of treatment for patients with persistent asthma and to prevent exacerbations resulting in emergency department (ED) use and/or hospitalization.² Despite evidence-based treatment guidelines, underutilization of inhaled corticosteroids is high in underserved children with asthma, contributing to increased asthma morbidity in these children. Prior literature have shown that low ICS use is associated with lack of follow-up care, poor parental understanding about ICS medication use and over-reliance on rescue medications.^{3,4}

Previous studies suggest that adherence to ICS medication in children involves several factors. Family asthma routines have been suggested to improve adherence to asthma medications and may improve preventative care in adolescents and others have shown that parental beliefs influence adolescent and young adult health behavior.⁵ Also, past childhood socioeconomic status (SES) has a strong influence on adult health behavior independent of the adult's current SES in a proportional manner (e.g. better health-promotion practices with higher SES)⁵. This indicates a need to evaluate additional factors that may influence use of asthma medications in children and young adults for improved clinical outcomes.

Healthcare providers play a significant role in maximizing a patient's pharmacotherapy and adherence by educating on device use and explaining asthma control to patients in a variety of clinical settings. Previous studies have demonstrated the need to measure ongoing preventative medication adherence in children with asthma as they age into young adulthood.⁶ The purpose of this study was to evaluate past childhood asthma management practices in current asthmatic adults to identify potential areas for improvement in asthma control during childhood.

Methods

A single center descriptive cross sectional survey was conducted in an urban academic medical center from October 2012 to April 2012. Ambulatory pediatric asthma patients were managed by primary care and pulmonary specialist providers in a medical center clinic setting. Adult asthmatic patients were identified from a previously enrolled pediatric asthma study⁷ or who had received care from the adult emergency department (ED). Subjects enrolled into the study had an active diagnosis of asthma; were 18 years old and older but no greater than 30 years old; had a diagnosis of asthma by 12 years of age; and not currently participating in another asthma study. Excluded subjects included those who had difficulty in speaking and understanding the English language; did not have access to a working telephone; and a co-morbid respiratory condition such as cystic fibrosis, lung cancer, chronic obstructive pulmonary disease, sarcoidosis, or tuberculosis.

A series of specific and open ended questions were administered as a survey to assess the following: (1) **Baseline Characteristics:** age, gender, race, health insurance provider, education level, age of diagnosis, age of self-administered short acting beta-agonist (SABA) medication, and their age as to when they were responsible for obtaining their own asthma medication supply; (2) **Childhood Asthma Management Characteristics:** attendance of an asthma education session, and the primary person administering their asthma medication during childhood; and (3) **Childhood Asthma Education and Areas for Improvement:** the most helpful advice received regarding rescue medication, specific asthma management information they wished to have known, and other areas for improvement.

The questionnaire was administered over the telephone for eligible subjects identified via a previous research study and as an in person interview for subjects recruited in the adult ED. An expedited institutional review board approval was obtained. Descriptive statistics were used to analyze the data. Analyses were conducted using SPSS Version 22 software.⁸

Results

Forty-one eligible adult asthmatic patients participated in our survey; twenty-nine from a previous pediatric study and twelve that received care from the ED. Thirty-nine asthmatic adults from a previously enrolled pediatric asthma study and twenty-one adult asthmatic patients receiving care in the adult ED were asked to participate.

Baseline characteristics (see table 1) of the forty-one eligible subjects surveyed had a mean (S.D.) age of 22.5 (3.5) years old, more females than males (approximately 2:1), and were predominantly African American (95.1%). Most subjects had Medicaid health insurance (70.7%), and at least a high school education (70.7%). Mean (S.D.) self-reported age of asthma diagnosis (3.4 years, SD 3.6), age at when they self-administered SABA inhaled medication (11.4 years, SD 2.9) and age at when they were responsible for procuring their asthma medications (15.5 years, SD 2.2) years. Three subjects were not able to provide their age of SABA self-administration and two subjects did not know when they were responsible for obtaining their asthma medicines.

Almost two-thirds (63%) of the subjects reported never attending an asthma education session during childhood. The primary person responsible for administering their asthma medications was their mother (78%), followed by a grandmother (17.1%). One each (2.4%) mentioned a sibling and a family friend as the primary person administering their medications.

Approximately half (46.3%) of respondents indicated that none of the inhaled SABA use information provided to them as a child was helpful. Little over one-quarter (26.8%) felt that information on “how to use inhalers” and 14.6% with information on “how and when to use inhalers” were useful. When assessing asthma management information they wished to have known as a child, over three-quarters (78%) wanted to learn more about recognizing allergic triggers and seven individuals (17.1%) wanted to know how to properly use inhalers. Only one (2.4%) subject indicated that they did not need to know additional asthma management information. See table 2.

Items identified as overall areas for pediatric asthma care improvement include: provide more education sessions (48.7%), involve parents into the education sessions (14.6%) and explain other medication options (4.9%). A significant number of respondents (31.7%) did not indicate an overall area for childhood asthma education or area for improvement (see table 2).

Discussion

Our single center descriptive cross sectional survey in an urban academic medical center indicate that a high proportion of subjects reported that they did not attend an asthma education session as a child and approximately half reported that they would have liked to have access to more childhood educational sessions. This strongly suggests that there is a need for additional and more intensive asthma teaching in childhood. However, it is uncertain as to what age a child would be motivated enough to truly engage in educational sessions to positively influence asthma morbidity in adulthood. Studies indicate patients with asthma require continual asthma management education due to the presence of age-related events, which result in decreased disease control such as non-adherence, tobacco use, inability to use inhaled medications, and corticosteroid-related side effects.⁹

Adult involvement for facilitating asthma medication administration during childhood is important. The significant maternal and grandmother involvement in an urban environment is consistent with the highly prevalent maternal and grandmother presence in these inner city households. The overwhelming maternal and grandmother involvement of asthma medication administration in childhood further supports the make-up of most urban households. However, the inclusion of other household member involvement (if available) towards medication administration assistance could have positive or negative influence depending on the dynamics of each social situation. More importantly, it has been identified that positive relationships between quality of family (household) functioning and frequency of family routines for asthma treatment adherence as important factors for positive medication adherence.¹⁰

Interestingly, a high proportion of respondents wished they had known more about recognizing allergen triggers to asthma. It is unclear as to the age of a child for which this information can be effectively taught or was this response simply a snapshot reflection during adulthood at the time of the survey. Nonetheless, allergen trigger knowledge was identified as of value to our participants and should be incorporated and/or enhanced into childhood asthma education programs on a continuous basis. Perhaps employing a gaming system for the child to identify items to stay away from; as what had been employed by the Mr. Yuk poison prevention program may benefit younger asthma patients and allergen avoidance.¹¹

Focusing on their ability to use a rescue inhaler as a child, slightly over half indicated that either how or when to use their rescue medication was the most useful information they had received. The many required steps for properly receiving metered dose inhalers with a tube spacer may be challenging for younger children who may have short attention spans and are easily distracted. A significant proportion of participants felt that none of the information provided to them as a child was useful. This may suggest metered dose inhaler devices may not be the best method for rescue drug delivery for younger children and, contrary to current practice, the administration of a SABA by a nebulizer may be an easier drug delivery method with less patient effort.

Limitations of this study include a small sample size; a predominantly African American population in an urban setting with females outnumbering males by 2:1. Also, given the nature of a retrospective survey design, issues of accurate recall of subjective data is always a point for concern, especially when the recall is during their childhood. However, given our findings, we recommend additional childhood asthma education is needed with the emphasis on proper use of rescue inhaler medications and the awareness of allergen triggers to asthma. Based on Piaget's Cognitive Developmental Stages, educational programs could be offered as young as 7 years old as children 7-12 years old are in the concrete operations stage and should be able to understand and incorporate medication education.^{12,13} Incorporating parent(s) or household members into the educational sessions is also necessary so that they can foster the child's proper asthma management practice as they age into adulthood and gain independence to their care. In addition, our data supports the recent European Academy of Allergy and Clinical Immunology (EAACI) guidelines that provides recommendations for effective transition of adolescents and young adults with allergy and asthma.¹⁴

In conclusion, all healthcare providers are encouraged to provide continuous asthma education to their pediatric patients and their family members or guardian for improved asthma outcomes.

Conflicts of Interest: None

Funding Source: None

Clinical Trial Registration: N/A

Abbreviations/Acronyms: None

Declaration of Interest Statement: The authors report no conflict of interest.

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Table 1. Baseline Characteristics

Characteristic (N=41)	Mean (SD) or n (%)
Age (yr)	22.5 (3.5)
Gender	
Female	27 (65.9)
Male	14 (34.1)
Race	
African American	39 (95.1)
White	1 (2.4)
Native American	1 (2.4)
Health Insurance	
Government-assisted	29 (70.7)
Private	7 (17.1)
Self-pay/cash	4 (9.8)
Did not know	1 (2.4)
Education Level	
High school graduate or more	29 (70.7)
Did not graduate high school	12 (29.3)
Age of Asthma Diagnosis (yr)	3.4 (3.6)
Age of SABA medication self-administration* (yr)	11.4 (2.9)
Age of Asthma Medication Self-Procurement** (yr)	15.5 (2.2)

SABA, short acting beta-agonist

*n=38

**n=39

Table 2. Childhood Asthma Education and Areas for Improvement

Areas for Improvement	n (%)
Overall Areas for Improvement	
Provide more educational sessions	20 (48.7)
Involve parents into education sessions	6 (14.6)
Explain other medication options	2 (4.9)
None	13 (31.7)
Asthma Management Information Wished to Have Known	
Recognizing allergen triggers	32 (78)
Knowing how to properly use inhalers	7 (17.1)
None	1 (2.4)
Most Helpful Information Received Regarding SABA Inhaler Use	
How to use inhalers	11 (26.8)
When to use inhalers	5 (12.2)
How and when to use inhalers	6 (14.6)
None	19 (46.3)