Impact of a Certified Asthma Educator Pharmacist on Medication Adherence in Patients with Persistent Asthma in an Inner-City Hospital

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Abstract

Background: The medication management for people with asthma (MMA) Healthcare Effectiveness Data and Information Set (HEDIS) measure assesses adherence to controller therapy > 75% of the calendar year. A new "Action List" feature recently incorporated into Allscripts, the hospital electronic health record (EHR), is used by a certified asthma educator (AE-C) pharmacist to track both the progress of and to improve patients' MMA measures.

Objective: To evaluate the impact of an AE-C pharmacist using an EHR Action List on improving the number of patients with a MMA > 75% compared to a pre-intervention group.

Methods: This was a retrospective, pre-post cohort study assessing the impact of an AE-C pharmacist on 2017 versus 2016 calendar year MMA measures. During the intervention period, the AE-C pharmacist conducted patient follow-up calls, as per the Action List, for refill reminders and identification/resolution of nonadherence. Providers were contacted for prescription renewals and insurance formulary changes. This data was compared with historical data from 2016.

Results: One-hundred and fifty-five patients were identified, 100 in the 2017 pharmacy intervention group and 55 in the pre-intervention (pre-Action List) group. There was no significant increase in the MMA > 75% measure in the Action List group when compared with the pre-intervention group (46% vs. 34.6%, $p=0.1667$). More patients who met the MMA measure were seen by a pulmonologist versus a primary care provider in both groups.

Conclusions: The AE-C pharmacist intervention was associated with a non-significant 11.4% increase in patients with a MMA > 75%. This small preliminary study suggests promising results for the use of pharmacists to improve HEDIS measures, especially in PCP clinics.

Keywords: Asthma, Pharmacy Practice, HEDIS, Quality measures

Abbreviations: AE-C: Certified Asthma Educator; MPR: Medication Possession Ratio; MMA: Medication Management for people with Asthma; HEDIS: Healthcare Effectiveness Data and Information Set; EHR: Electronic Health Record; PCP: Primary Care Provider; PDC: Percentage of Days Covered

Introduction

Asthma is a chronic lung disease characterized by repeated episodes of wheezing, breathlessness, chest

tightness, and coughing, and affecting people of all ages [1]. According to the most recent data from the United States Centers for Disease Control and Prevention (CDC), asthma affects about 24.6 million people in the US and

poses a significant health and economic burden to patients, families, and society [2]. In New York City, the borough most affected by asthma is the Bronx, the South Bronx in particular. Asthma affects 10.7% of the South Bronx population, a disproportionately high prevalence, considering that it affects 10.2% of the population of New York City, and only 7.8% of the population nationwide [3].

Our health system serves residents of the South and Central Bronx, one of the poorest areas in New York State with a high rate of asthma and utilization of hospital resources. At the outpatient pulmonary clinic, Certified Asthma Educator (AE-C) pharmacists are part of a multidisciplinary team that includes respiratory therapists and pulmonologists working together in the evaluation and management of patients with asthma. The role of the AE-C pharmacist is to provide asthma education and improve adherence to medications.

Asthma control is largely contingent upon both trigger avoidance and adherence to chronic therapy; yet medication adherence is often subpar among people with asthma, as is the case for those affected by other chronic conditions. National data show that 74% of physicians believe their patients are taking chronic medications as prescribed, however 83% of patients would not tell their physicians if they plan not to fill the prescription just written for them [4],[5]. On average, 15% of patients will not fill their first prescription, and after 6 months 55% of patients suffering from chronic diseases will not take their medications as prescribed [6],[7].

Among patients with asthma, Bidwal et al. evaluated medication adherence rates in an underserved population. A total of 121 people were assessed for adherence using the medication possession ratio (MPR) and were categorized into two groups: medium-high ($MPR \geq 0.5$) and low ($MPR < 0.5$). The majority of patients (66.1%) were found to be in the low adherence group [8].

The medication management for people with asthma (MMA) measure, one component of the 2017 Healthcare Effectiveness Data and Information Set (HEDIS) is used to assess adherence among patients with persistent asthma based on medical and pharmacy claims data. The MMA measure is defined as patients remaining on their controller medication for $\geq 50\%$ and $> 75\%$ of their treatment period [9].

At our health system, an "Action List" feature, which allows for tracking of patients' MMA measures, has

been incorporated into the electronic health record (EHR) (Allscripts). Use of an EHR has been reported to improve patient care and help track outcomes [10]. The new Action List categorizes patients into "Missed", "Achievable", and "Complete" to identify those at high risk for non-adherence. For example, a patient categorized as "Missed" has a MMA $< 75\%$ with no potential to meet the measure in the specified timeframe. In addition, the Action List provides readily available information for the user, including patient and pharmacy information, active prescription for the measure, refill data, the next due date, preferred primary care provider (PCP) - with the ability to directly send a secure health message, and the current proportion of days covered (PDC) with the maximum possible for the patient.

The goal of this study was to use the MMA measure to evaluate the impact of the AE-C pharmacist's use of the Action List on patients' adherence to asthma medications.

Methods and Materials

This study was a retrospective, single-center, pre-post cohort chart review. A pre-intervention period (pre-Action List) from January 1, 2016 to December 31, 2016 was compared to a post-intervention period from January 1, 2017 to December 31, 2017. The Action List intervention was conducted from October 15, 2017 to December 31, 2017. The intervention period was initially planned to begin earlier, however, due to a delay in an Allscripts upgrade the feature was not incorporated into Allscripts until October 2017. Data for the pre-intervention period was provided solely by the administrative claims database of Healthfirst, a large local managed care organization that insures $> 75\%$ of our health system's population. The post-intervention data was collected from Health first, the Action List, and the EHR.

Since the implementation of the Action List, an AE-C pharmacist used it to focus on patients who were categorized as achievable for the MMA measure. Phone calls were made to these patients and/or their pharmacies for refill reminders and identification/resolution of non-adherence. In addition, providers were contacted for prescription renewals and insurance formulary changes that required a switch of medication.

The primary outcome was the number of patients with a MMA $> 75\%$ post use of the Action List by the AE-C pharmacist in comparison to the 2016 historical cohort. A secondary outcome was the difference between the MMA in patients seen in PCP clinic versus pulmonary clinic. The

study was approved by the Institutional Review Board.

Patients

Adult patients > 18 years with a diagnosis of persistent asthma were included in the study if they fulfilled any of the following parameters in 2016 or 2017, respectively: (1) ≥ 1 emergency department visit, (2) ≥ 1 acute inpatient encounter, (3) ≥ 4 outpatient visits on different dates and ≥ 2 asthma medication dispensing events, or (4) ≥ 4 asthma medication dispensing events. Patients were required to have Healthfirst insurance and a visit with an in-network PCP or pulmonologist. Patients were excluded if they were diagnosed with persistent asthma, but were not prescribed a controller medication.

Data collected included basic demographics, asthma severity, asthma medications and PCP versus pulmonologist visit type.

Statistical Analyses

Descriptive statistics of pre-intervention and post-intervention data, including means, standard deviations (SD), and percentages were reported for all measures whenever applicable. The student t-test and chi-square test were used to compare baseline characteristics. The chi-square test was used to evaluate the primary outcome. A p-value of less than or equal to 0.05 was considered statistically significant.

Results

A total of 468 patients were identified, 155 met inclusion criteria: 55 in the pre-intervention period and 100 in the post-intervention period. Baseline characteristics of the patients are summarized in table 1. There were no differences between the groups regarding asthma severity, asthma medications, and visit type.

In the pre-Action List period, 19 (34.6%) patients met the MMA > 75% measure compared to 46 (46%) in the

Table 1: Baseline clinical and demographic characteristics

Characteristics	Pre-intervention n = 55	Post-intervention n = 100	P-value
Age, y, mean (SD)	42.07 + 14.26	42.32 + 15.12	0.921
Gender, female, n (%)	51 (92.7%)	84 (84%)	0.121
Race, n (%)			<0.0001
African American	17 (30.9%)	31 (31%)	
Latino	13 (23.6%)	3 (3%)	
Other	24 (43.6%)	40 (40%)	
Unknown	1 (1.8%)	26 (26%)	
Visit Type, n (%)			0.227
Primary Care Provider	41 (74.5%)	61 (61%)	
Pulmonologist	11 (20%)	32 (32%)	
AE-C Pharmacist	3 (5.5%)	7 (7%)	
Asthma Severity, n (%)			0.496
Mild	12 (21.8%)	24 (24%)	
Moderate	14 (25.5%)	35 (35%)	
Severe	3 (5.5%)	3 (3%)	
Not documented	26 (47.3%)	38 (38%)	
Asthma Medications ^a , n (%)			0.073
ICS	11 (20%)	34 (34%)	
ICS + LABA	12 (21.8%)	9 (9%)	
LTRA	3 (5.5%)	11 (11%)	
ICS + LTRA	12 (21.8%)	16 (16%)	
ICS + LABA + LTRA	17 (30.9%)	30 (30%)	

^aICS = inhaled corticosteroid; LTRA = leukotriene receptor antagonist; LABA = long-acting beta agonist

post-Action List period. An 11.4% increase in the MMA > 75% measure was seen; however this was not statistically significant ($p=0.1667$, 95% CI).

Significantly more patients who met the MMA measure were seen in pulmonary clinic versus PCP clinic for both 2016 ($p=0.0395$, 95% CI) and 2017 ($p=0.0037$, 95% CI) (Table 2).

Table 2: Comparison of MMA between generalists and pulmonologists

HEDIS Measurement Year	MMA >75% PCP Visit	MMA > 75% Pulmonary Visit	P-value
2016	11 (26.8%)	8 (57.1%)	0.040
2017	21 (34.4%)	25 (64.1%)	0.004

Discussion

Improvements in health care, better resource utilization, and decreased hospital admissions and emergency room visits are some of the goals of most managed health care insurances. The Action List feature was created to produce a uniform and efficient process for tracking and monitoring patients' adherence throughout the year. Improved medication adherence could lead to better disease control and decreased use of healthcare resources.

Our study suggests that the use of an Action List by an AE-C pharmacist may improve asthma medication adherence, as indicated by HEDIS adherence measures.

Pharmacists, known to be among the most accessible health care professionals in the community, are the ideal individuals to assist with improving medication adherence due to the combination of advanced medication and insurance knowledge. Such improved medication adherence was demonstrated by Lee et al. in a study evaluating the effect of a pharmacy care program on anti-hypertensive and anti-cholesterol medication adherence [11]. They found that medication adherence among 200 patients improved to 96.9% from 61.2% after a 6-month period of medication education and regular follow-up by pharmacists. Their intervention was also associated with significant improvements in systolic blood pressure and LDL-C levels [11].

To our knowledge, this is the first study using an Action List feature to improve medication adherence outcomes. Many community pharmacies utilize different technologies for automatic refills and alerting patients when prescriptions are available for pick-up. At CVS pharmacy a pharmacy advisor counseling service is available where non-adherent patients are identified by a predictive analysis program and contacted by either a pharmacist or pharmacy intern to determine and address

the cause of non-adherence. The program has shown to increase adherence to cholesterol lowering therapy up to 12%, anti-hypertensive medications by up to 10%, and anti-diabetic medications by up to 9% [12].

There are several studies comparing asthma outcomes when patients are treated by subspecialists, i.e. allergists or pulmonologists, versus generalists. All of them suggest that management by a subspecialist leads to improved disease control and decreased cost [13],[14],[15]. Our study adds to this body of research by showing that patients seen in pulmonology clinic may also be more adherent to their medications – i.e. more likely to meet the MMA measure - than those seen in PCP clinics.

One of the strengths of this pilot is the novel approach of integrating the AE-C pharmacist into the care and education of people with asthma in the outpatient setting. Furthermore, this study used technological features of the EHR for not only tracking of patients, but improving care.

Limitations

There are several limitations of the study. First, it is a single-center study in an inner-city area; the population may not be representative of other areas. Second, the small number of patients and the short Action List intervention period could have skewed the results. Due to the late implementation of the Action List feature many patients were already in the "Missed" category by October 2017, thus limiting the number of patients the pharmacist could impact for the 2017 year. Third, the Action List was only able to include patients with a single insurance which does not encompass our entire population.

Conclusion and Clinical Implications

Incorporation of an AE-C pharmacist in the care of people with asthma in an inner-city area increased the number of patients with a MMA > 75% by 11.4%,

demonstrating promising results for the use of pharmacists to improve medication adherence. Based on the preliminary data from this pilot study, two additional AE-C pharmacists were allocated to improve HEDIS outcomes, provide asthma education in the emergency department, refer patients to pulmonary specialists, and use and follow the Action List to monitor patients' measures over the year. In addition, the success of our efforts led to the creation of an ambulatory care pharmacy resident position that will focus on using the Action List to improve the HEDIS medication adherence measures for diabetes, dyslipidemia, and hypertension for the 2018 year. In light of this current study's findings we suggest that future research focus on the use of the Action List to improve medication adherence among both high-risk patients and patients seen in primary care clinics. Future researchers may also identify and address the reason for the differences in outcomes between generalists and subspecialists, as this could potentially both decrease costs and improve patient care.

Conflicts of Interest

- There are no potential conflicts of interest by all the authors.
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