Quality and Access to Care Among a Cohort of Inner-city Adults With Asthma*

Who Gets Guideline Concordant Care?

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Study objectives: **Asthma morbidity is highest among inner-city populations. This study measured whether quality and access to care over time was concordant with National Asthma Education and Prevention Program (NAEPP) guidelines. It also identified factors associated with NAEPP guideline-concordant care.**

Design: **A prospective, observational cohort study**

Setting: **An urban academic medical center.**

Patients: **A consecutive cohort of 198 inner-city adults hospitalized for asthma.**

Measurements: **Detailed information about sociodemographics, asthma history, access to care, history of the current exacerbation, prescription and use of inhaled corticosteroids (ICS) and β-agonists, and other elements of NAEPP-concordant care (spacers, metered-dose inhaler [MDI] technique, peak flow meters, and action plans) was collected during the index admission and 1 month and 6 months after discharge.**

Results: **In this predominantly low-income, nonwhite cohort, while 92% of patients had insurance and 80% had a usual source of care, 73% reported delays in seeking care. ICS were prescribed for 77% of patients prior to hospital admission, 83% at 1 month, and 67% at 6 months. Adherence with other NAEPP recommendations were 89% for receipt of MDI instruction, 68% for spacers, 80% for peak flow meters, 31% for written action plans for worsening, and 22% for written plans for attacks. In multivariate analysis, greater asthma severity and having a usual source of care increased the odds of receiving ICS, spacers, and peak flow meters. Care by a specialist increased the odds of receiving action plans. Patients who spoke mostly Spanish were less likely to be given spacers or action plans.**

Conclusion: **Baseline problems with quality and access to care persisted over time. Better systems of care are needed to ensure that high-risk patients receive an appropriate step-up in the quality of ongoing asthma care.** ***(CHEST 2005; 128:1943–1950)***

Key words: access; adherence; asthma; guidelines; management; quality

Abbreviations: ED = emergency department; ICS = inhaled corticosteroids; MDI = metered-dose inhaler; NAEPP = National Asthma Education and Prevention Program

Asthma is a major health problem affecting 17 million Americans at a cost of $11 billion per year.[1,2] Minority inner-city populations have disproportionately higher rates of asthma incidence, morbidity, and mortality.[1,3,4] Rates of hospitalizations and emergency department (ED) visits are greatest in the Northeast, especially in cities such as New York.[1,4] East Harlem, in New York City, is one of the most severely affected communities in the United

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This study was funded by the Agency for Healthcare Research and Quality (RO1 HS09973) and the United Hospital Fund (010608B). Dr. Halm was also supported by the Robert Wood Johnson Foundation Generalist Physician Faculty Scholars Program and Dr. Wisnivesky by the Agency for Healthcare Research and Quality (K08 HS013312-O1A1).

Manuscript received November 9, 2004; revision accepted April 20, 2005.

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States, with asthma hospitalization and death rates that are several times higher than the national average.[5–7]

There is overwhelming evidence that inhaled corticosteroids (ICS) reduce symptoms, functional limitations, and health-care utilization due to asthma.[8] For over a decade, there has also been consensus about best practice as outlined in the federal National Asthma Education and Prevention Program (NAEPP) guidelines.[9,10] Numerous government agencies, health plans, and delivery systems have worked to disseminate and implement these guidelines.

Despite the confluence of evidence, consensus, and health policy focus, the quality of asthma care in adults is often suboptimal.[11–19] The quality problems of underuse of ICS and overuse of short-acting β-agonists also appears to be worse in nonwhites.[13,18,20] Compliance with NAEPP guideline recommendations for self-management education and trigger avoidance was also lower in African Americans.[18,20]

Most studies[13–15,17–19] that have measured the quality of care of asthma care have primarily focused on ambulatory populations and were cross-sectional in nature. The few studies[11,12,16] that focused on those sick enough to require emergency treatment or hospitalization have also reported gaps in quality, although these were also cross-sectional designs. There is scant information about whether the quality and comprehensiveness of asthma care improves following an exacerbation serious enough to merit hospitalization, especially in communities with the highest asthma morbidity.

The main goals of this study were as follows: (1) to comprehensively measure the quality and access to care in a cohort of inner-city adults hospitalized for asthma, and assess if care is concordant with NAEPP guidelines; (2) to determine whether provision of guideline-concordant care improves over time; and (3) to identify the socioeconomic, clinical, and access to care factors that are independently associated with receipt of NAEPP guideline-concordant care. We hypothesized that hospitalization might be a sentinel event that would provide additional motivation to patients and physicians to intensify treatment and self-management education.

Materials and Methods

Study Participants

We prospectively identified an inception cohort of all adults hospitalized for asthma at Mount Sinai Hospital, a 1,100-bed academic health center in New York City, during a consecutive 12-month period (September 2001 through September 2002). Mount Sinai Hospital is the largest hospital serving East Harlem. We screened computerized hospital admission logs to identify all adults with a primary or secondary admission diagnosis of asthma (493, 493.X, and 493.XX). The study was approved by the local Institutional Review Board.

Inclusion and Exclusion Criteria

Eligible patients were ≥ 18 years old, spoke English or Spanish, were competent to give informed consent, and had asthma as the primary reason for hospital admission (confirmed by chart review). Exclusions were primary COPD, other lung disease, or home oxygen therapy; and hospital admission and discharge on the same weekend when study personnel were not available.

Data Collection and Measurement

Trained research staff conducted an interviewer-administered survey in English or Spanish during the index admission and 1 month and 6 months after discharge. Domains of interest included the following: sociodemographics, asthma history, access to care, history of the current exacerbation, and process of care (prescription and use of ICS and short-acting β-agonists, spacers, and peak flow meters, and action plans, among others). We defined guideline-concordant care as the processes of care outlined in the NAEPP including: prescription of ICS, meter dose inhaler (MDI) instruction, spacers, peak flow meter monitoring, and action plans.[10] All patients in the study met NAEPP indications for ICS as well as all of the above elements of care. We distinguished action plan advice that was written vs oral, as well as those for worsening symptoms vs frank attacks. We considered use of nine or more puffs per day of a short-acting β-agonist to be an indicator of poor control and potential overuse, a definition used previously.[13,21]

Statistical Analysis

Mean ± SDs are presented for normal data, and medians are presented for nonnormal data. We used χ^2 tests, Wilcoxon rank-sum tests, *t* tests, and Cochrane-Mantel-Haenzel trend tests (as appropriate) to examine changes in quality measures over time and univariate predictors of NAEPP guideline-concordant care. We used logistic regression to identify multivariate predictors of guideline-concordant care. We chose to examine each of the six quality indicators as separate dependent variables (rather than constructing a global quality score) because they represent considerably different behaviors and the results were simpler to interpret. Because many of the independent variables were highly correlated, we first identified the most robust independent predictors of guideline-concordant care within each domain (sociodemographics, asthma history, psychosocial, and access to care). The best candidate factors significant at the $p < 0.2$ level for each domain were carried forward into the final multivariate models. Alternate multivariate models that also adjusted for age, sex, and/or other severity measures (age of asthma diagnosis, frequency of oral steroid use, prior hospitalization/ED visits) produced similar results. The final multivariate models for the provision of MDI instruction, spacers, and peak flow meters needed to omit one of the five final covariates (either prior intubation or specialty provider) because there was quasiseparation of the data (100% of patients in these categories received the indicator resulting in a noninformative odds ratio and confidence interval). Omission of this one covariate from the models did not alter the overall findings. All analyses used two-tailed significance levels of $p < 0.05$ and were conducted with statistical software (SAS version 9.0; SAS Institute; Cary, NC).