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Original Contributions

ACCESS TO DISEASE TREATMENT AMONG PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT WITH ASTHMA OR HYPERTENSION

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Abstract—Background: Asthma and hypertension are common among Emergency Department (ED) patients. Primary care providers are integral in managing these conditions, yet these patients are often in the ED. **Objective:** To determine access to care among ED patients with asthma or hypertension and the association with sociodemographic factors and disease acuity. **Methods:** This was a prospective, cross-sectional study of ED patients at an urban county hospital conducted between June 4 and August 31, 2008. Consenting patients were surveyed, and peak flow or blood pressure measured as appropriate. Access to disease treatment was defined as self-reported access to a primary care provider or current prescription for asthma or hypertension, or both. **Descriptive statistics and multinomial logistic regression were used to analyze data. Results:** There were 2303 patients enrolled; 283 had asthma, 543 had hypertension, and 187 had both. Seventy-one patients (25.1%) with asthma, 151 patients (27.8%) with hypertension, and 19 patients (10.2%) with both had poor access to disease treatment. Seeking ED medical attention was related to having poor access to treatment for patients with both asthma and hypertension. Females with asthma had poor access to treatment. In hypertension patients, good access to treatment was associated with excellent/good health status, housing status, and decreasing age. Poor

access to treatment was associated with increasing blood pressure. **Conclusions:** Poor access to disease treatment and aspects of socioeconomic status were associated with seeking care in the ED. Changes in access to treatment may affect the number of patients seeking ED care, but not the severity of the presenting illness. © 2015 Elsevier Inc.

Keywords—asthma; hypertension; emergency medicine; emergency department; access to health care

INTRODUCTION

The chronic diseases of asthma and hypertension are very common in patients presenting to emergency departments (EDs) throughout the United States. It is well known that the treatment of hypertension decreases the risk of coronary artery disease, stroke, and renal failure (1). Similarly, the appropriate treatment of asthma controls symptoms, maximizes normal activity levels and exercise regimens, and prevents asthma exacerbations (2). Primary care providers are integral in overseeing and maintaining appropriate care for these chronic health conditions, as they are able to provide continuous, comprehensive, and coordinated care (1–4).

The ED is a catchall provider of medical care. Due to this, the ED treats a range of conditions, both urgent and nonurgent, and consequently cares for many patients with chronic diseases such as hypertension and asthma.

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Some patients with chronic diseases may use the ED for chronic care that is better provided in the primary care setting; one study showed that with appropriate, high-continuity primary care, asthmatic patients have a 60–75% reduction in ED visits and a 25% reduction in hospitalizations, as well as better health outcomes (5). Despite this, some patients continue to use the ED along with Emergency Medical Services for nonurgent reasons. Previous research has shown that factors associated with nonurgent use of the ED include poverty, homelessness, lack of a regular primary care provider, increased patient comorbidities and number of medications, and fragmented primary care and lack of coordination among providers (6–19).

Additionally, past research has shown that Medicaid enrollees or those who are underinsured may have reduced access to primary and specialist care and they therefore may choose the ED for care (20). However, even patients that are adequately insured may still choose the ED over other health care settings due to disconnects with the primary health care system (21). Further, patients may choose the ED for care due to its convenience, though recently emerging community paramedicine programs, where paramedics have additional training to assess patients and transfer them to alternative facilities when indicated, may alleviate some admissions that would be better served elsewhere (22).

It is known that when patients have access to needed services such as medications and a primary care physician, health outcomes are better (23). Less information, however, is available on the disease control of patients with chronic diseases such as hypertension and asthma, who are seen in the ED. In this study we aimed to characterize the demographics and health care-seeking behaviors of patients with these two chronic conditions presenting to an urban ED.

The primary goal for this study was to determine if ED patients with asthma, hypertension, or both conditions have access to disease treatment by assessing if they have a primary care provider or medication(s) for their chronic disease, and to assess their associations with demographic factors, self-reported health condition, medical history, and where they usually seek medical attention. We also sought to determine if there was a difference in the acuity of patients in the ED with and without access to disease treatment using blood pressure as a marker of severity for hypertension and peak flow as a marker of asthma.

METHODS

Study Design and Setting

This was a cross-sectional study conducted in the ED of the Hennepin County Medical Center (HCMC), a Level

I trauma center with approximately 99,000 annual visits. This is an urban safety-net hospital that provides care for many underserved and diverse patient populations. The HCMC Human Subjects Research Committee approved the study prior to implementation. Between June 4 and August 31, 2008, we screened patients presenting to the ED through a standard sampling during daily randomized 8-h time intervals covering all 24 h a day (7 a.m.–3 p.m., 3 p.m.–11 p.m., and 11 p.m.–7 a.m.).

Participant Eligibility & Classification

All adult (age > 18 years) patients in the ED were eligible for this study. We excluded patients with high acuity complaints per the treating clinician (including sexual assault), prisoners and those in police custody, speakers of languages other than English, patients presenting with altered mental status, and patients determined to be vulnerable adults. The exclusion due to intoxication or drug use, critical condition, vulnerable adult, or sexual assault status was determined by the treating clinician. Among those participants who were subsequently noted to have completed the study more than once, we excluded those whose presentations to the ED were separated by <2 weeks.

Data Collection

Data were collected by volunteer research associates (RAs) of the HCMC Emergency Medicine Research Associate Program. The RAs were available during study shifts to monitor all patients in the ED. All patients that were roomed in the ED were approached by an RA unless their chart or the treating clinician indicated that they did not qualify per the exclusion criteria. All eligible patients were approached and screened to ensure they were eligible and then underwent informed consent. An enrollment log was kept, recording all eligible and ineligible patients in the ED.

All consenting participants completed the 34-question survey of patient demographics, health condition, medical history, and health care access administered by the RAs in a standardized fashion. Additionally, all patients had their blood pressure measured and recorded. If the patient reported a history of asthma, a four-question supplemental survey and peak flow measurement was also completed. Only patients reporting a history of asthma performed a peak flow measurement per the direction of the trained RA as part of the asthma supplemental data collection. Afterward, using age and height, the predicted peak flow and the percent of predicted peak flow were calculated for each participant. Patients freely reported answers and were given the option to stop the survey at any time. Patient enrollment was monitored by a

single RA who maintained an electronic log of all ED patients during that study shift. Completed paper surveys were entered into an Excel spreadsheet (Microsoft Corporation, Redmond, WA) maintained and electronically backed up on site.

Data Analysis

Data were analyzed using Stata 10.0 (StataCorp LP, College Station, TX). Descriptive statistics along with multinomial logistic regression were performed to compare access to care and disease control based on their chronic condition status. Variables that have been hypothesized in past medical and public health research to affect access to disease treatment in this patient population, including findings from our recent work, were included in the data collection a priori and in the subsequent analysis (24). This included age, gender, ethnicity, self-reported overall health, primary language, education, insurance status, employment status, living status, having a primary care physician, location of primary medical care, self-reported medications for chronic illness, and measured blood pressure and peak flow as appropriate (see Data Collection).

Patients were separated into four groups based on their reported disease status for analysis: a history of asthma, history of hypertension, history of both asthma and hypertension, or history of neither asthma nor hypertension. Disease status was determined by self-report by answering the survey question, "Have you ever been told you have asthma/hypertension?" To avoid multiple observation bias, patients with both conditions were included in only the asthma-and-hypertension group. For patients with multiple visits, only the initial survey was included. The primary outcome for this study was Access to Disease Treatment, defined as either having access to a primary care provider (self-reported) or being on a hypertension or asthma medication (self-reported), as appropriate if patient noted having either condition, or having both. We assumed that if a patient reported having a primary care provider or reported that they were on medication for their chronic condition, that they had access to appropriate management resources for their chronic condition. Given that patients self-reported the medications they were currently taking, we assumed that patients who were nonadherent were not providing information about the medications they were prescribed but not taking. We then sought to determine if blood pressure and peak flow measurements, as appropriate, correlated with access to disease treatment.

In our regression analysis, age, peak flow, and systolic blood pressure were treated as continuous variables. Sex and employment status were treated as binary variables, with male and employed as the reference groups, respec-

tively. Respondents were asked to characterize their ethnic background as white, Asian, black, Hispanic, Native American, multiethnic, or "other." For the analysis, ethnicity was designated as white (reference) and nonwhite. Participants were asked to categorize their perceived overall health status as "excellent," "good," "fair," or "poor," and this was designated as either excellent/good (reference) or fair/poor. Participants were asked to categorize their insurance status as "private," "none," "Medicare/Medicaid/safety net," or "other." For the analysis, this was designated as private (reference), and Medicare/Medicaid/safety net/none/other. Patients were asked where they usually go when needing medical attention, and this was categorized as "clinic," "emergency room," "traditional healer," or "other." This was designated as clinic (reference) and ED/other. For the analysis of these variables, we converted to binary variables from multinomial options to minimize categories with limited respondents while keeping groupings logical as well.

Univariate analysis was first completed to assess which variables were themselves significant in each group, followed by a multinomial logistic regression assessing for all variables. Covariance was assessed using a covariance matrix from the regression model to determine intervariable correlation that could bias the results. The level of statistical significance was set at 0.05 a priori. The primary outcome was Access to Disease Treatment, defined as either having access to a primary care provider or being on a hypertension or asthma medication.

RESULTS

Of the 8031 patients presenting to the ED during the random 8-h time intervals throughout the study period, 3363 (41.8%) met inclusion criteria and 4676 (58.2%) were ineligible for inclusion (Figure 1). The most common causes of exclusion were the inability to contact the patient either due to ongoing care within the ED or inability to locate the patient within the ED (1570 = 33.6%), and age < 18 years old (1115 = 23.8%).

Among those eligible for the study, 1060 (31.5%) refused to be surveyed and were subsequently excluded. The difference in ages of participating patients compared to patients declining participation was not significantly different (mean age, 39.8 compared to 40.3 years [$t = 0.94$; $p = 0.35$]). The overall proportion of males in the participating group was not significantly more than the overall proportion of males in the refusal group (51.7% compared to 48.2% [$z = -1.89$; $p = 0.059$]). The self-reported ethnicity was significantly different between participants and nonparticipants (30.4% of the refusers vs. 37.0% of the participants were white [$z = -3.75$; $p = 0.0002$]).

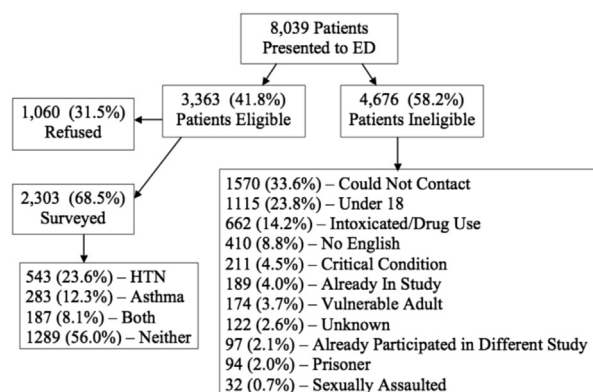


Figure 1. Patient flow. ED = emergency department; HTN = hypertension.

Demographics of the patients enrolled are shown in Table 1. Overall, we found that 71 of 283 patients (25.1%) with only asthma had poor access to disease treatment (as defined by having a primary care physician they see or currently taking medications for asthma or hypertension); 151 of 540 patients (27.8%) with only hypertension had poor access to disease treatment; and 19 of 98 patients (10.2%) with both asthma and hypertension had poor access to disease treatment (Table 2). Only 15.3% of all hypertension patients (patients in the hypertension only and hypertension-plus-asthma groups combined) reported taking an antihypertensive, compared to 60.0% of all asthmatics and 60.1% of all patients with both hypertension and asthma. Among patients with both conditions, 101 were determined to have access to disease treatment based on currently taking medications. Of these, 17 (16.8%) took prescriptions for both conditions, 64 (63.4%) took medications for asthma, and 20 (19.8%) took medications for hypertension.

Crude analysis (Table 3) showed that for asthma patients, male gender and increasing age were associated with better access to disease treatment (odds ratio [OR] 0.35; $p < 0.001$; 95% confidence interval [CI] 0.202–0.608, and OR 0.98; $p = 0.044$; 95% CI 0.95–0.999, respectively). Seeking medical attention in the ED or other also had a 2.78 times greater chance of poor access to disease treatment ($p = 0.001$; 95% CI 1.49–5.18). The odds became stronger in the multivariate logistic regression model, which found that the odds of having poor access to disease treatment is 3.73 times greater among asthmatics seeking medical attention in the ED when compared to those who receive care in a clinic setting ($p = 0.012$; 95% CI 1.33–10.44). The multivariate model also found male gender to be associated with better access to disease treatment (OR 0.28; $p = 0.006$; 95% CI 0.11–0.69). In both univariate and multivariate analyses, a participant's measurement of their percent of predicted peak flow was not significantly associated with access to disease treatment.

Among hypertension patients, univariate analysis showed that male gender and increasing age are associated with better access to disease treatment (OR 0.12; $p = 0.013$; 95% CI 0.40–0.90, and OR 0.96; $p < 0.001$; 95% CI 0.95–0.97, respectively), and that seeking medical attention at the ED or other had an increased likelihood of having poor access to disease treatment (OR 5.35; $p < 0.001$; 95% CI 3.46–8.29). Additionally, for hypertension patients, we found that self-reporting health of fair or poor compared to good or excellent had an increased likelihood of having poor access to disease treatment (OR 1.60; $p = 0.015$; 95% CI 1.09–2.33), and participants who reported they had transitional housing or were homeless were 2.83 times more likely to have poor access to disease control ($p < 0.001$; 95% CI 1.66–4.82). Finally, high systolic blood pressure was significantly associated with increased odds of having poor access to disease treatment (OR 1.01; $p = 0.004$; 95% CI 1.004–1.02). In the multinomial regression model for hypertension patients, seeking medical attention at the ED/other continued to be strongly associated with poor access to disease treatment (OR 6.41; $p < 0.001$; 95% CI 3.78–10.87). Increasing age was associated with increased odds of better access to disease treatment (OR 0.96; $p < 0.001$; 95% CI 0.94–0.97). When compared to a self-reported health status of excellent/good, a health status of fair/poor was associated with increased odds of poor access to disease treatment (OR 1.90; $p = 0.009$; 95% CI 1.17–3.07), as was transitional housing and homelessness (OR 2.59; $p = 0.005$; 95% CI 1.34–5.01). Increasing systolic blood pressure was significantly associated with poor access to disease treatment in multivariate analysis (OR 1.01; $p = 0.004$, 95% CI 1.004–1.02).

For patients with both asthma and hypertension, univariate analysis revealed no significant relationships, except that patients who report they seek medical attention at the ED or other are 4.45 times more likely to have poor access to disease control (OR 4.45; $p = 0.011$; 95% CI 1.42–14.0). There were also no significant findings in the multivariate model for this group.

In all groups (patients with asthma, hypertension, or both), we found no significant association between ethnicity and access to disease treatment, and there was no significant association between insurance status and access to disease treatment.

DISCUSSION

In this study of patients presenting to our urban ED, 71 patients (25.1%) with asthma but no hypertension had poor access to disease treatment; 151 patients (27.8%) with hypertension but no asthma had poor access to disease treatment; and 19 patients (10.2%) with both asthma and hypertension had poor access to disease treatment. To

Table 1. Participant Demographics

	All Participants N = 2302	Hypertension n = 543	Asthma n = 283	Both n = 187	Neither n = 1289
Mean age (SD), y	39.8 (15.2)	49.6 (15.2)	33.6 (13.0)	46.3 (13.3)	36.2 (13.5)
Age, y (%)					
18–29	723 (31.4)	55 (10.1)	129 (45.6)	26 (13.9)	513 (49.9)
30–42	620 (26.9)	116 (21.4)	84 (29.7)	39 (20.9)	380 (29.5)
43–55	607 (26.4)	194 (35.7)	52 (18.4)	77 (41.2)	285 (22.1)
56–69	269 (11.7)	126 (23.2)	15 (5.3)	38 (20.3)	90 (6.9)
≥70	83 (3.6)	52 (9.6)	3 (1.0)	7 (3.7)	21 (1.6)
Sex, n (%)					
Female	1083 (47.0)	211 (38.9)	177 (62.5)	115 (61.5)	580 (45.0)
Male	1219 (53.0)	332 (61.1)	106 (37.5)	72 (38.5)	709 (55.0)
Ethnicity, n (%)					
White	847 (36.8)	219 (40.3)	94 (33.2)	59 (31.6)	475 (36.9)
Asian	30 (1.3)	5 (0.9)	1 (0.4)	0	24 (1.9)
Black	943 (41.0)	240 (44.2)	122 (43.2)	93 (49.7)	488 (37.9)
Native American	159 (6.9)	34 (6.3)	30 (10.6)	17 (9.1)	78 (6.1)
Hispanic	142 (6.2)	14 (2.6)	12 (4.2)	3 (1.6)	113 (8.7)
Other	91 (3.9)	14 (2.6)	14 (4.9)	7 (3.7)	56 (4.3)
Multiethnic	25 (1.1)	7 (1.3)	2 (0.7)	2 (1.1)	14 (1.1)
Refused/unknown	65 (2.8)	10 (1.8)	8 (2.8)	6 (3.2)	41 (3.1)
Self-reported overall health, n (%)					
Excellent	354 (15.3)	38 (7.0)	45 (15.9)	3 (1.6)	268 (20.8)
Good	1010 (43.8)	214 (39.4)	104 (36.8)	54 (28.9)	638 (49.5)
Fair	666 (29.1)	210 (38.7)	100 (35.3)	68 (36.4)	288 (22.3)
Poor	244 (10.6)	79 (14.5)	32 (11.3)	55 (29.4)	78 (6.1)
Refused/unknown	28 (1.2)	2 (0.4)	2 (0.7)	7 (3.7)	17 (1.3)
Primary language at home, n (%)					
English	2032 (88.3)	503 (92.6)	267 (94.3)	183 (97.9)	1068 (82.9)
Not English	242 (10.5)	35 (6.5)	11 (3.9)	1 (0.5)	206 (16.0)
Refused/unknown	28 (1.2)	5 (0.9)	5 (1.8)	3 (1.6)	15 (1.1)
Mean length of US education, n (%), y					
<9	286 (12.4)	54 (9.9)	20 (7.1)	15 (8.0)	197 (15.3)
9 to 12	983 (42.7)	234 (43.1)	140 (49.5)	98 (52.5)	511 (39.6)
>12 to <16	832 (36.1)	159 (29.3)	92 (32.5)	46 (24.6)	354 (27.5)
≥16	174 (7.6)	92 (17.0)	31 (10.9)	27 (14.4)	205 (15.9)
Refused/unknown	27 (1.2)	4 (0.7)	0	1 (0.5)	22 (1.7)
Insurance, n (%)					
Private	548 (23.8)	99 (18.3)	51 (18.0)	31 (16.6)	365 (28.3)
None	468 (20.3)	87 (16.0)	64 (22.6)	21 (11.2)	296 (23.0)
Medicare/Medicaid/safety net	956 (41.6)	276 (50.8)	123 (43.5)	110 (58.8)	447 (34.7)
Other	269 (11.7)	68 (12.5)	33 (11.7)	22 (11.8)	148 (11.5)
Refused/unknown	61 (2.6)	13 (2.4)	12 (4.2)	3 (1.6)	33 (2.5)
Employment status, n (%)					
Yes	978 (42.5)	171 (31.5)	111 (39.2)	52 (27.8)	644 (50.0)
No	1213 (52.7)	319 (58.7)	164 (58.0)	120 (64.2)	610 (47.3)
Retired	106 (4.6)	51 (9.4)	8 (2.8)	14 (7.5)	33 (2.6)
Refused/unknown	5 (0.2)	2 (0.4)	0	1 (0.5)	2 (0.1)
Housing status, n (%)					
Property owner	352 (15.3)	92 (17.0)	40 (14.1)	16 (8.6)	204 (15.8)
Homeless	134 (5.8)	36 (6.6)	22 (7.8)	15 (8.0)	61 (4.7)
Halfway house/transitional housing	90 (3.9)	28 (5.2)	12 (4.2)	9 (4.8)	41 (3.2)
With friends or relatives	375 (16.3)	79 (14.5)	52 (18.4)	23 (12.3)	221 (17.2)
Renting	1189 (51.7)	282 (51.9)	135 (47.7)	113 (60.4)	659 (51.1)
Refused/unknown	161 (7.0)	26 (4.8)	22 (7.8)	11 (5.9)	103 (8.0)
Regular primary care, n (%)					
Yes	1361 (59.1)	385 (70.9)	166 (58.7)	142 (75.9)	668 (51.8)
No	931 (40.4)	158 (29.1)	116 (41.0)	45 (24.1)	612 (47.5)
Refused/unknown	10 (0.5)	0	1 (0.3)	0	9 (0.7)
Where usually go when need medical attention, n (%)					
Clinic	1084 (46.1)	268 (49.4)	121 (42.8)	93 (49.8)	602 (46.7)
Emergency department	1018 (44.2)	248 (45.6)	131 (46.3)	86 (46.0)	553 (42.9)
Traditional healer	6 (0.3)	1 (0.2)	1 (0.3)	0	4 (0.3)
Other	68 (2.9)	19 (3.5)	9 (3.2)	4 (2.1)	36 (2.8)
Refused/unknown	126 (5.5)	7 (1.3)	21 (7.4)	4 (2.1)	94 (7.3)

US = United States.

Table 2. Breakdown of Variable Access to Disease Treatment

Type of Patient	Total Patients	Access to Disease Treatment n (% of Total with Disease)	No Access to Disease Treatment n (% of Total with Disease)	Reason for Access to Disease Treatment		
				Access to PCP n (% of Total with Access)	Access to Medication n (% of Total with Access)	Access to PCP & Medication n (% of Total with Access)
Hypertension	543	392 (72.2)	151 (27.8)	332 (84.7)	7 (1.8)	53 (13.5)
Asthma	283	212 (74.9)	71 (25.1)	85 (40.1)	46 (21.7)	81 (38.2)
Both	187	168 (89.8)	19 (10.2)	67 (39.9)	26 (15.5)	75 (44.6)

PCP = primary care physician.

our knowledge, this is the first time that patients were specifically stratified by asthma, hypertension, or both conditions. Patients with both asthma and hypertension were reported as having disease control if they took medications for either condition. Of note, only 15% of hypertensive patients reported taking antihypertensives, compared to 60% among both asthmatics and patients with both asthma and hypertension. Closer examination of patients with both asthma and hypertension had the same relationship; fewer patients took medications for hypertension compared to asthma. These results indicate much lower

adherence of antihypertensives compared to medications for asthma, which aligns with our clinical knowledge of the treatment of hypertension.

In both asthmatic and hypertensive patients, poor access to disease treatment was associated with seeking medical attention at the ED/other compared to seeking medical attention at the clinic. These findings are consistent with previous studies correlating the use of the ED and either lack of a primary care provider or medications for their disease (5,8,9,12,16,19). This indicates an area where perhaps newly emerging community

Table 3. Results of Univariate and Multivariate Analysis for Access to Disease Treatment, Stratified by Disease Type

	Crude Values			Adjusted Values		
	OR	p-Value	95% CI	OR	p-Value	95% CI
Asthma patients						
Male gender	0.35	<0.001	0.20–0.61	0.28	0.006	0.11–0.69
Increasing age	0.98	0.044	0.95–0.999	0.99	0.54	0.94–1.03
Nonwhite ethnicity	1.18	0.57	0.66–2.13	1.39	0.52	0.51–3.75
Self-reported health – fair/poor vs. excellent/good	0.73	0.26	0.42–1.26	0.98	0.97	0.38–2.53
Unemployed	0.85	0.56	0.49–1.46	0.58	0.25	0.22–1.47
Insurance – government/none/other vs. private	1.25	0.55	0.60–2.60	1.68	0.45	0.43–6.52
Medical attention – goes to ED/other vs. clinic	2.78	0.001	1.49–5.18	3.73	0.012	1.33–10.44
Living status – transitional/homeless vs. property/renting/friends	1.18	0.69	0.52–2.69	0.82	0.76	0.23–2.95
Peak flow	1.00	0.492	0.99–1.00	1.00	0.29	0.99–1.00
Hypertension patients						
Male gender	0.12	0.013	0.40–0.90	0.67	0.13	0.41–1.12
Increasing age	0.96	<0.001	0.95–0.97	0.96	<0.001	0.94–0.97
Nonwhite ethnicity	1.14	0.5	0.77–1.68	0.66	0.11	0.40–1.10
Self-reported health – fair/poor vs. excellent/good	1.60	0.015	1.09–2.33	1.90	0.009	1.17–3.07
Unemployed	0.91	0.64	0.61–1.36	0.86	0.6	0.50–1.49
Insurance – government/none/other vs. private	1.16	0.54	0.72–1.89	1.14	0.68	0.62–2.11
Medical attention – goes to ED/other vs. clinic	5.35	<0.001	3.46–8.29	6.41	<0.001	3.78–10.87
Living status – transitional/homeless vs. property/renting/friends	2.83	<0.001	1.66–4.82	2.59	0.005	1.34–5.01
Systolic blood pressure	1.01	0.054	1.00–1.02	1.01	0.004	1.004–1.02
Patients with both asthma and hypertension						
Male gender	0.53	0.19	0.20–1.37	0.35	0.49	0.02–6.94
Increasing age	0.98	0.23	0.94–1.01	0.96	0.52	0.84–1.09
Nonwhite ethnicity	0.50	0.15	0.19–1.30	0.52	0.61	0.04–6.40
Self-reported health – fair/poor vs. excellent/good	3.53	0.016	1.27–9.81	15.30	0.09	0.65–361.0
Unemployed	0.63	0.37	0.23–1.71	0.10	0.14	0.01–2.09
Insurance – government/none/other vs. private	1.14	0.85	0.31–4.16	1.32	0.91	0.01–124.4
Medical attention – goes to ED/other vs. clinic	4.45	0.011	1.42–14.0	–	–	–
Living status – transitional/homeless vs. property/renting/friends	2.14	0.22	0.63–7.21	–	–	–
Systolic blood pressure	1.00	0.82	0.98–1.02	1.00	0.97	0.92–1.09
Peak flow	1.00	0.93	0.99–1.01	0.99	0.37	0.96–1.01

OR = odds ratio; CI = confidence interval; ED = emergency department.

paramedicine programs could bridge the gap in access to care and assist in connecting these patients with appropriate facilities and programs that can better cater to their chronic disease management needs than the ED.

Among asthma patients, male gender and increasing age were associated with better access to disease treatment in the crude analysis, but only male gender was associated with access in the adjusted model. This raises the possibility that there are differences in access to care based on gender, which may be related to systemic, societal, cultural, or other differences we have not yet defined. Additionally, in patients with hypertension, having transitional housing and homelessness are associated with poor access to disease treatment. This finding is consistent with previous studies and similar to a study focusing on the elderly finding that low socioeconomic status was associated with increased use of the ED (6–8).

In patients with hypertension we also found that self-reported health status as fair/poor compared to excellent/good is associated with poor access to disease treatment. Several studies have also compared self-reported health status and disease control and have found that patient self-reported poor health status is associated with marital status, depressive symptoms, obesity, and amount of exercise (25,26). Although our study looked at different factors, all conclusions suggest that the majority of patients are aware of their health status and control of their chronic disease.

In our three subgroups of patients, we found no associations between poor access to disease treatment and having private insurance compared with government-issued insurance and no insurance. Thus, access to care in this study did not seem to be related to insurance or financial barriers.

Finally, we found that peak flow was not significantly associated with poor access to disease treatment, and although we found that increasing systolic blood pressure was significantly associated with poor access to disease treatment, this finding has low utility, as the odds ratio was 1.01. Had our study shown that patients without access to disease treatment were more acutely ill, it may have indicated that they were coming to the ED because the lack of access to treatment was causing them to delay medical care until they were more acutely ill. The lack of meaningful difference in peak flow and systolic blood pressure between patients with and without access to treatment indicates that patients may come to the ED for roughly the same level of disease severity regardless of access to disease treatment.

Limitations

Excluding patients who were unable to provide informed consent (e.g., minors and those with altered mental status

[i.e., intoxicated patients]) left only 41.8% of our patients eligible for the study. Four hundred ten (8.8%) of those who were excluded were non-English speakers. This was done to avoid adversely affecting patient care by distracting already busy interpreters from their clinical work. This patient population may have different disease status and control, thus, their exclusion and underrepresentation may have yielded different results. Additionally, we were unable to contact many patients during their ED stay (33.6% of excluded) due to their ongoing treatment and the rapid turnover of ED patients. Of those eligible, 31.5% did not consent to the survey. These patients may also have different patterns of disease that were not captured by this study. Additionally, by separating our sample by specific disease, we decreased our sample size in each subgroup. For example, there were only 19 participants in our combined asthma/hypertension category who had poor access to disease treatment. This may have led to different results than with the entire study population. However, we felt that these diseases were different enough to warrant separate analysis.

Although the survey was administered in a standardized fashion to maximize consistency in patient understanding of questions, all data obtained for this study were self-reported, possibly limiting accuracy and reliability in this patient population. There was no method for verifying the accuracy or truthfulness of our study population, hence, our decision to assume that any patient self-reporting the medications they were taking was doing so because they were compliant with taking them. As with all cross-sectional studies, our results do not show causality or explanation of the relationships, but instead show association. Finally, data were collected at an urban, county hospital in Minnesota. There was a high proportion of unemployed with government/safety net insurance or no insurance. These may limit the generalizability of our results.

In addition, we did not obtain information about method of arrival or chief complaints for the patients enrolled. This information could have provided more insight regarding possible solutions for access to care for chronic medical issues. Also, the survey did not ask patients where they obtained their prescription medications. Thus, there may have been patients enrolled who reported regularly taking medications for asthma or hypertension that routinely received their prescriptions in the ED but were still included as having access to disease treatment.

CONCLUSIONS

Seeking medical care in the ED, lower self-reported health status, and not having stable housing were associated with poor access to disease treatment for either or

both asthma and hypertension. Access to disease treatment was not significantly associated with the surrogate markers of disease acuity, peak flow, and systolic blood pressure; nor was access to disease treatment associated with insurance status. This may indicate that changes in access to disease treatment may affect the number of patients seeking medical care in the ED for asthma and hypertension, but not the severity of illness with which they present.

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ARTICLE SUMMARY**1. Why is this topic important?**

It is known that many patients seek care in the emergency department (ED) that could be better provided in a primary care setting, such as chronic disease management. Chronic disease control of patients seen in the ED is not clear.

2. What does this study attempt to show?

This study attempts to characterize the demographics and health care-seeking behaviors and access to disease treatment of patients with asthma and hypertension presenting to an urban ED.

3. What are the key findings?

25.1% of patients with asthma, 27.8% of patients with hypertension, and 10.2% of patients with both asthma and hypertension had poor access to disease treatment, which was associated with seeking medical attention at the ED vs. clinic and certain socioeconomic variables such as housing status, which is similar to previous studies. We found no association between insurance status and poor access to disease treatment. Peak flow and systolic blood pressure were not strongly associated with poor access to disease treatment.

4. How is patient care impacted?

Almost one-fourth of the patients in this study did not have adequate access to either primary care or medications for chronic conditions and insurance status does not seem to be a determining factor in access to treatment. This is an important finding and gap in our ability to get patients connected to care. The lack of difference in peak flow and blood pressure between patients with and without access to disease treatment indicates that the severity of disease is not impacted by access to treatment, at least among patients presenting to the ED.