Assessment of Hypertension Guidelines Adherence at a Free Clinic Serving a Predominantly Latino Population in Providence, RI

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ABSTRACT

Hypertension affects more than 50 million people in the United States. A recent national health study (NHANES) found that the proportion of certain Hispanic ethnic groups with stage 1 and stage 2 hypertension was greater than for whites. In order to identify areas of improvement, as well as to examine trends in patient outcomes, Clínica Esperanza/Hope Clinic (CEHC), a free clinic for the uninsured, recently conducted a study to evaluate how well the clinic's hypertensive patients are treated, according to current guidelines for hypertension, as compared to other clinics in the U.S. that serve the uninsured. *For five out of the six health measures documented*, at least 50% of CEHC hypertensive patients met or exceeded the goal values; these numbers are on par with if not better than other national comparators. This study has provided encouraging baseline data, upon which CEHC plans to make further improvements.

KEYWORDS: Hypertension, Hispanic, Latino, Uninsured, Free Clinic

I. INTRODUCTION

The prevalence of hypertension stands at greater than 50 million affected individuals in the United States (U.S.), and it affects an estimated one billion individuals globally. Despite intensive efforts by the American Heart Association (AHA), clinical providers and public health officials, the National Center for Health Statistics reported that in 2009-2010, blood pressure was controlled in only 53% of hypertensive individuals in the United States.[1] Moreover, nearly 20% of hypertensive individuals living in the U.S. were unaware of their condition, many of whom are Hispanic or uninsured.[2] Chronic diseases such as hypertension, diabetes, and metabolic syndrome disproportionately affect Hispanic communities in the United States, for reasons that may be related to genetic or socioeconomic factors, diet, exercise, and uninsurance. A recent review of National Health and Nutrition Examination Survey (NHANES) data revealed that selected Hispanic groups were at much higher risk of having uncontrolled stage 1 or 2 hypertension than non-Hispanic whites,[3] and other research has shown a higher incidence of uncontrolled or improperly monitored hypertension among uninsured individuals.[4,5]

Clínica Esperanza/Hope Clinic (CEHC) serves uninsured patients from communities around Olneyville, a primarily Hispanic/Latino, low-income neighborhood in Providence, RI. The location of the clinic provides unique access to a patient population facing dual disparities – low access to health care (due to lack of insurance of roughly 12%) and health disparities, particularly hypertension, diabetes and being overweight.[6,7] Fifty-seven percent of Olneyville residents are Hispanic/Latino; 22% are non-Hispanic white; 14% are African-American; 7% are Asian or Pacific-Islander, and 7% claim two or more races.[8] The median family income is $19,046; the majority of residents do not have a high school diploma, and 41% percent of families live in poverty.[8]

In 2012, CEHC screened more than 2,145 individuals, providing free blood pressure checks, cholesterol and blood glucose screens, and "talk-to-the-doctor" sessions at the clinic location in Olneyville or at four outreach sites in Providence. To lower the barrier to healthcare access, CEHC established the CHEER Clinic, a free, nurse-run, walk-in clinic that addresses non-urgent healthcare needs.[9] We recently completed an evaluation of our ability to provide diabetes care, and found that our clinic met or exceeded standards established by the American Diabetes Association.[10,11] To evaluate the success of CEHC in managing hypertensive patients, we examined CEHC's adherence to current guidelines and compared CEHC's rates of goal achievement to those of other clinics and medical centers. The goal of this clinical management study was to identify areas of improvement, including discrepancies between CEHC and the current guidelines, as well as to examine trends in CEHC patient outcomes, which may help us improve care.

II. METHODS

We performed a retrospective chart review. The study population included 57 active hypertensive patients out of 119 total hypertensive patients who were actively attending clinic visits at CEHC from January 1, 2011 through July 30, 2013. Active hypertensive patients were defined as those who visited the clinic at least two times after their diagnosis of hypertension, at least three times in the study period, and had at least one visit on or after January 1, 2012. See **Table 1** for CEHC patient demographics.

Patient names were coded and de-identified, and patient information was recorded in a spreadsheet. Data included body mass index (BMI), systolic and diastolic blood pressure

Table 1. Clínica Esperanza/Hope Clinic patient and hypertensive patient demographics.

Demographics	2010-2011	2011-2012	2012-2013	Patient Population	Hypertensive Patients	%	Study Subjects	%
Race/Ethnicity								
Hispanic	947	1163	1445	72%	85	71%	44	77%
White	90	146	220	9%	10	8%	5	9%
Black or African American	92	144	179	8%	13	11%	6	11%
Asian	14	26	62	2%	-	-	-	-
Other/no answer	43	86	202	7%	11	9%	2	4%
Gender								
Male	544	711	997	46%	61	51%	29	51%
Female	658	839	1148	54%	58	49%	28	49%
Age								
0-18	18	8	18	1%	0	0	0	0%
18-40	340	605	817	36%	15	13%	6	11%
41-60	603	741	953	47%	73	61%	38	67%
61+	223	183	190	12%	30	25%	13	23%
n=	1202	1585	2145		119		57	

In this table, we compare the overall demographics (% population) of patients attending the Clínica Esperanza/Hope Clinic between 2010 and 2013 to the patients with hypertension (Hypertensives and the Study Subjects). The proportion of study subjects and patients who have hypertension, for each of the demographic categories, is similar to the overall population, although skewed towards higher age ranges, and slightly (but not significantly) higher among African-American patients.

readings, creatinine, and serum potassium. The values for sitting blood pressure readings from each patient's initial visit in the study period and the six most recent blood pressure readings were recorded. We compared the results to those of similar studies and JNC 7 guidelines.

III. RESULTS

Population

Our study population demographic data reflects CEHC's predominantly Hispanic patient population (**Table 1**). While slightly more of the patients at CEHC are female (51% versus 49% for males), the gender distribution is reversed among hypertensive patients (51% male versus 49% female).

Clinically Relevant Biomarkers

CEHC's results in comparison to AHA standards are shown in **Table 3**. The mean systolic blood pressure of hypertensive patients was 133.6 (SD 17.5mmHg); 68% of the patients had a systolic blood pressure that was at goal (<140mmHg[1]). See **Table 2** for definitions of 'at goal'. The mean of diastolic blood pressures of CEHC's hypertensive patients was 82.0 (SD 9.6mmHg), and 68% of clinic patients were at or below the goal (<90mmHg). Over time, 81% were at the diastolic blood pressure goal by their sixth visit. Fifty-five percent of patients had both systolic and diastolic blood pressures that were at goal. The average body mass index (BMI) in our cohort was 30.3 (SD 5.8kg/m^2). Only 11% of the hypertensive cohort of patients at CEHC had a BMI in the healthy range. In this study we did not examine BMI change over time.

Health Behaviors

Ninety-one percent of the patients in the cohort reported that they did not smoke. Eighty-nine percent of the cohort reported that they were not heavy drinkers, whereas only 11% were identified as heavy drinkers. Whether our hypertensive patients followed the Dietary Approaches to Stop Hypertension (DASH) diet was not recorded in their electronic medical record. Adherence to recommended daily exercise could not be evaluated: only nine out of the 57 patients' exercise habits were documented in the electronic medical records with eight reporting that they exercised on a regular basis.

Frequency of Lab Testing

Seventy-three percent of our hypertensive patients had their creatinine levels measured at least twice within the preceding year at the time of our survey. The same percentage of our cohort had their serum potassium levels measured at least twice within the last year. Eighty-nine percent of the patients also had their blood pressures measured at least twice within the last year, with eighty-three of our patients following the recommended frequency of blood pressure measurements for their specific stage of hypertension.

Comparison with Similar Studies

We compared our patients' results to other published results (**Table 3 and Figure 1**). For five out of the six health measures that were documented (systolic blood pressure, diastolic blood pressure, total blood pressure, BMI, smoking, and alcohol intake), at least 50% of CEHC hypertensive patients met or exceeded the goal values. The BMI was the only category for which less than 50% of patients were at goal,

Table 2. Summary of the Joint National Committee Guidelines on Hypertension Management[1]

ASSESSMENT	FREQUENCY OF MONITORING	GOAL	TAKE ACTION	TREATMENT
Cardiovascular				
Blood pressure monitoring	Every month for stage 1 hypertension until goal is reached. At least once a month for stage 2 hypertension until goal is reached Monitor every three to six months after goal is reached.	<140/90 mmHg <130/80 mmHg in patients with diabetes and/or renal disease	>140/90 mmHg >130/80 mmHg in patients with diabetes and/or renal disease	Encourage lifestyle changes for prehypertensive, stage 1 and 2 hypertensive patients. **Stage 1** hypertensive patients without compelling indication may take thiazide-type diuretics and may consider ACEI, ARB, BB, CCB, or combination. **Stage 2** hypertensive patients may undertake a two-drug combination of above of which one is a thiazide-type diuretic.
Laboratory Tests				
Serum Potassium	1 or 2 times annually	3.7 to 5.2 mEq/L.	<3.7 mEq/L	DASH Diet
Creatinine or eGFR	1 or 2 times annually	0.7 to 1.3 mg/dL for men and 0.6 to 1.1 mg/dL for women	>1.3 for men >1.1 for women Less than 60 GFR	Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed
Lifestyle				
Nutrition	As needed	Healthy eating for blood pressure control	Poor serum potassium and/or calcium control or increased weight	DASH Diet
Exercise	Each visit	> 30 minutes a day on at least 5 days a week	< 30 minutes a day on at least five days a week, poor metabolic control	Exercise >30 min a day on at least 5 days a week.
Smoking	Each visit	No cigarette smoking	Cigarette smoking	Counsel to stop smoking
Drinking	Each visit	<1 oz of ethanol per day in men and <0.5 oz of ethanol in women.	>1 oz of ethanol per day in men and >0.5 oz of ethanol in women.	Counsel to reduce alcohol consumption
Self-management	Each visit	Healthy hypertension management with blood pressure control		Referral to health educators or health education classes.

This table provides a summary of the Joint National Committee Guidelines on Hypertension Management. The suggested frequency of blood pressure monitoring, goal values, and suggested courses of action are described for different categories of lab testing and hypertension-monitoring health behaviors.

underperforming compared to the two other studies. Since the number of hypertensive patients followed at CEHC is limited as compared to the other published studies, the statistical significance of these figures was not determined.

CEHC achieved a higher success rate for blood pressure being at goal, than three of the five other studies (**Figure 1**).[12–16] Only a single specialty clinic (Rush University Hypertension Clinic) and a hospital-based outpatient clinic were able to achieve success rates that were slightly higher (59% and 62%) than CEHC's overall success rate (55%).[10,13] CEHC patients achieved significantly lower mean total blood pressure, systolic blood pressure, and diastolic blood pressure than forty-four U.S. community health centers and six urban community-based clinics (**Figure 1**).[11,12]

For health behaviors related to hypertension, CEHC only documented information on smoking (91% of hypertensives reported that they were nonsmoking) and alcohol intake (89% reported that they did not consume alcohol). Dietary information (related to the DASH diet) and exercise information was not recorded in the electronic medical record. Based on self-reported information, the study patients had lower rates of smoking and drinking than three other similar studies.[12,17,18]

IV. DISCUSSION

As noted, the problem of access to health care is particularly acute for Hispanics, both nationally and locally.[19] Hispanics also have higher rates of obesity, high blood pressure, and are 50% more likely to die from diabetes than non-Hispanic whites.[20] One third of the 41.2 million uninsured in the United States are Hispanic/Latino – three times the rate of

Table 3. Comparison of hypertension-related biomarkers of CEHC patients with similar studies.

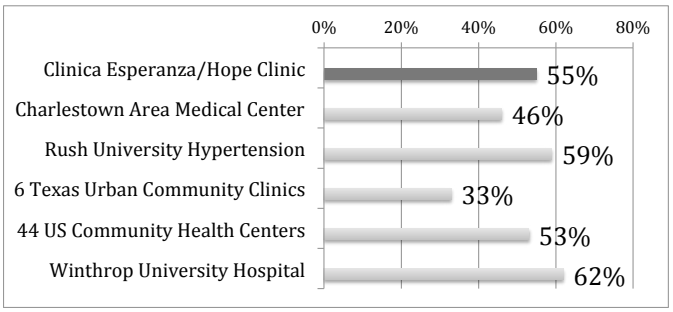
CATEGORY		PARAMETERS	BLOOD PRESSURE mm (Hg)		BMI (kg/m2)
			Systolic	Diastolic	
Clínica Esperanza/Hope Clinic	Goal	<140/90	<140	<90	<25
	Success Rate	**55%**	**68%**	**68%**	**11%**
	Mean ± SD	-	133.6±17.5	82.0±9.6	30.3±5.8
Charlestown Area Medical Center[9]	Goal	<140/90 and <130/80 for diabetics	-	-	<25
	Success Rate	46%	-	-	17.8%
	Mean ± SD	-	-	-	-
Rush University Hypertension Clinic[10]	Goal	<140/90	<140	<90	-
	Success Rate	59%	63%	86%	-
	Mean ± SD	-	137±15	79±9	-
6 Urban, Community-based Clinics[11]	Goal	<140/90	<140	<90	-
	Success Rate	33%	-	-	-
	Mean ± SD	142/84	142±18	84±12	32.1±6.4
44 U.S. Community Health Centers[12]	Goal	≤140/90 and <130/80 for diabetics	-	-	-
	Success Rate	53%	-	-	-
	Mean ± SD	-	-	-	-
Outpatient (2007)[13]	Goal	<140/90	-	-	-
	Success Rate	62%	-	-	-
	Mean ± SD	-	-	-	-

A BMI of ≥ 30 is defined as obese, a BMI that is ≥ 25 but < 30 is overweight, and <25 is healthy.

the non-Hispanic white population.[21] In Rhode Island, 28% of the uninsured population is Hispanic/Latino.[22] When choosing a location to provide free health services, Clínica Esperanza/Hope Clinic selected Olneyville because it has the greatest concentration of uninsured residents affected by undiagnosed health conditions and limited access to health care in Rhode Island (see Olneyville Report[23] and our own survey of neighborhood health needs[24]). Limited English proficiency and low health literacy are both prevalent among our Hispanic/Latino patients, and they affect numerous behaviors necessary for effective hypertension self-management (e.g., interpretation of food labels, analysis of salt content and measurement of blood pressure).[25]

Despite these disadvantages, the results of this study confirm that this volunteer-run free clinic's standard of success is comparable to that of other hospitals and clinics that serve both uninsured and insured patient populations. There is still significant room for improvement. The report provides a baseline level of data against which to compare future interventions, such as increased engagement of patients in physical exercise, one-on-one medication, diet and exercise adherence coaching, and home blood pressure monitoring.

Figure 1. Percentage of patients with blood pressure at AHA Goal.



Percentage of patients with overall blood pressure at goal compared to other published studies of JNC 7 guidelines adherence. CEHC shows a higher rate of achievement than 3 other major health institutions. At CEHC, Rush University Hypertension Clinic, Texas urban community centers, and Winthrop University Hospital Outpatient Clinic, goal was defined as <140mmHg systolic and <90mmHg diastolic. At Charlestown Area Medical Center and US community health centers, the additional criteria was added that hypertensive patients who were co-morbid with diabetes must have <130mmHg systolic and <80mmHg diastolic.

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References

1. Yoon SS, Burt V, Louis T, Carroll MD. (2012). Hypertension among adults in the United States, 2009-2010. National Center for Health Statistics Data Brief, 107.
2. Centers for Disease Control and Prevention (CDC). Racial/Ethnic disparities in the awareness, treatment, and control of hypertension - United States, 2003-2010. *MMWR Morb Mortal Wkly Rep*. 2013 May 10;62(18):351-5.
3. Centers for Disease Control and Prevention (CDC). Racial/Ethnic disparities in the awareness, treatment, and control of hypertension - United States, 2003-2010. *MMWR Morb Mortal Wkly Rep*. 2013 May 10;62(18):351-5.
4. Gai YW, Gu NY. Association Between Insurance Gaps and Continued Antihypertension Medication Usage in a US National Representative Population. *American Journal of Hypertension*. 2009;22(12):1276-1280.
5. Duru OK, Vargas RB, Kermah D, Pan DY, Norris KC. Health insurance status and hypertension monitoring and control in the United States. *American Journal of Hypertension*. 2007;20(4):348-353.
6. Liao Y, Bang D, Cosgrove S, Dulin R, Harris Z, Taylor A, White S, Yatabe G, Liburd L, Giles W. Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion; Centers for Disease Control and Prevention (CDC).
7. Surveillance of health status in minority communities - Racial and Ethnic Approaches to Community Health Across the U.S. (REACH U.S.) Risk Factor Survey, United States, 2009. *MMWR Surveill Summ*. 2011 May 20;60(6):1-44.
8. Olneyville at a glance (Providence Plan). http://local.provplan.org/profiles/oln_main.html. Accessed 23 Nov. 2013.
9. Bicki A, Silva A, Joseph V, et al. A Nurse-Run Walk-In Clinic: Cost-Effective Alternative to Non-urgent Emergency Department Use by the Uninsured. *J Community Health*. 2013.
10. Eldakroury A, Olivera E, Martin R, De Groot AS. Adherence to American Diabetes Association Guidelines in a Volunteer-run Free Clinic for the Uninsured: Better than Standards Achieved by Clinics for Insured Patients. *R I Med J* (2013). 2013;96(1):25-9.
11. American Diabetes Association. Standards of medical care in diabetes – 2012. *Diabetes Care*. 2012; 35 Suppl 1:S11.
12. Jami P, Smith P, Moningi S, et al. Compliance with joint national committee 7 guidelines in hypertension management in a teaching institution. *American Journal of Medical Quality*. 2007;22(4):251-258.
13. Singer GA, Izhar M, Black HR. Goal-oriented hypertension management - Translating clinical trials to practice. *Hypertension*. 2002;40(4):464-469.
14. Spranger CB, Ries AJ, Berge CA, Radford NB, Victor RG. Identifying gaps between guidelines and clinical practice in the evaluation and treatment of patients with hypertension. *American Journal of Medicine*. 2004;117(1):14-18.
15. Landon BE, Hicks LS, O'Malley AJ, et al. Improving the management of chronic disease at community health centers. *New England Journal of Medicine*. 2007;356(9):921-934.
16. Wang S, Berbaru N, Choi D, McNamara J, Feuerman M, Bucci K, Malone B. Managing hypertension in patients with or without comorbidities in a teaching hospital outpatient setting. *Pharmacy & Therapeutics*. 2007;32(1):32-43.
17. Collins T. Adherence to hypertension management recommendations for patient follow-up care and lifestyle modifications made by military healthcare providers. 2000.
18. Guthmann R, Davis N, Brown M, Elizondo J. Visit Frequency and Hypertension. *The Journal of Clinical Hypertension*. 2005;7:327–332. doi: 10.1111/j.1524-6175.2005.04371.
19. Beckles GL, Zhu J, Moonesinghe R. Centers for Disease Control and Prevention Diabetes - United States, 2004 and 2008. *MMWR Surveill Summ*. 2011 Jan 14;60 Suppl:90-3. (CDC). http://www.cdc.gov/mmwr/preview/mmwrhtml/su6001a20.htm#tab1
20. Heron M. Deaths: leading causes for 2007. *Natl Vital Stat Rep*. 2011 Aug 26;59(8):1-95.
21. Cersosimo E, Musi N. Improving treatment in Hispanic/Latino patients. *Am J Med*. 2011 Oct;124(10 Suppl):S16-21.
22. Kaiser Family Foundation. Health Coverage & Uninsured. State Health Facts. http://kff.org/state-category/health-coverage-uninsured/. Accessed 23Nov2013.
23. Olneyville: Action for A healthier community. Olneyville Housing Corporation and the Rhode Island Department of Health. Published online, 2012. http://www.olneyville.org/Healthier_Olneyville_Assessment_Report.pdf. Accessed 23 Nov 2013.
24. Khan S, Velazquez V, O'Connor C, Simon RE, De Groot AS. Health care access, utilization, and needs in a predominantly Latino immigrant community in Providence, Rhode Island. *Med Health R I*. 2011 Oct;94(10):284-7. 2011.
25. Leyva M, Sharif I, Ozuah PO. Health literacy among Spanish-speaking Latino parents with limited English proficiency. *Ambul Pediatr*. 2005 Jan-Feb;5(1):56-9.

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