Brief Report

Analysis of hypertension control rates among participants in the Georgia Hypertension Management and Outreach Program

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ABSTRACT

Background: This study utilized health department electronic medical records retrospectively to evaluate hypertension control rates achieved by the Georgia Hypertension Management and Outreach Program (HMOP), an education, screening, and treatment control program that provides services, including blood pressure screening and assessment, referral to physicians, counseling, educational material, disease case management, and treatment.

Methods: Hypertension control rates after at least 6 months of study participation were determined for patients participating in the program for at least 6 months between 2010 and 2014, and for African American and uninsured subgroups.

Results: The overall hypertension control rate was 61.1%, above the 2012 national average of 51.8%. The control rates for African Americans and the uninsured were 58.9% and 62%, respectively, compared to 41.7% and 28.7% nationally.

Conclusions: Although potential bias sources in the use of retrospectively obtained electronic medical records should be considered, this analysis suggests that the Georgia HMOP provides substantial improvements in hypertension control for a population of patients with otherwise poor control.

Key words: hypertension, blood pressure, cardiovascular diseases, African Americans, medically uninsured

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INTRODUCTION

Control of blood pressure (BP) reduces cardiovascular morbidity and mortality (James et al., 2014), but control is particularly poor for African Americans and the uninsured (Gu et al., 2012; Fiscella & Holt, 2008; Valderamma et al., 2013). In this study, we retrospectively utilized health department electronic medical records (EMRs) to evaluate hypertension control rates achieved by the Georgia Hypertension Management and Outreach Program (HMOP), an education, screening, and treatment control program operated in collaboration between the Georgia Department of Public Health, local public health districts, and county health departments. Control rates were determined overall and in African American and uninsured subgroups of the HMOP.

METHODS

De-identified data were extracted retrospectively from health department EMRs for patients with HMOP-associated visits between January 1, 2010 and December 31, 2014 across the 12 public health districts (72 counties) that participated in the program for one year or more during this period. Program rules required that, to be enrolled, patients present with a BP reading above the Joint National Committee 8 (JNC8) recommendations, that is, systolic BP (SBP) above 140 mmHg or diastolic BP (DBP) above 90 mmHg (Chobanian et al., 2003). Since the EMRs did not cover the first year of the program (2009), the dataset did not include each subject's date of entry into the program. Because many patients likely enrolled prior to Jan 1, 2010, baseline BP upon enrollment could not be determined.

Without values for baseline BP, it was not possible to determine changes in BP or control status. The analysis was limited to determination of population hypertension control rates in HMOP participants with at least 6 months of follow-up data available, to ensure sufficient time to see effects from changes in diet and physical activity, adherence to a management plan, or other behavior changes. Of the 2,272 patients with at least one visit during the timeframe considered, 1,061 had at least 6 months of follow-up.

BP control was defined using the JNC8 guidelines (SBP < 140 and DBP <90) and the number of controlled subjects as the number whose BP at their final visit within the 6- to 12-month interval fell below these limits. The hypertension

control rate was calculated as the number of controlled subjects divided by total number of subjects in the program. The Georgia Department of Public Health Institutional Review Board reviewed this project and declared it exempt.

RESULTS

Of the 1,061 patients who had at least 6 months of follow-up, BP was recorded for 1,007 (94.9%) during the 6 to 12 month timeframe. The remaining 5.1% had visits during this period, but BP was not recorded. Demographic and clinical characteristics of these 1,007 patients are given in Table 1. The population was largely African American (72.5%), uninsured (89.5%), female (75.4%), and middle-aged (58.5% age 40-59). Since the dataset did not include the first year of the program, we were not able to ascertain baseline BP. Mean SBP and DBP at the first recorded visit were within the controlled range, but many patients were likely enrolled in the study prior to this first recorded visit. Thus, it is likely that BP at first recorded visit did not reflect true baseline BP, since BP above the JNC8 standard was required for program enrollment.

Table 1. Patient demographics

Race/Ethnicity	**n=1007**
African American	72.5%
White	27.4%
Other	<1%
Sex	
Men	24.6%
Women	75.4%
Age	
18-39	10.6%
40-59	58.5%
>= 60	30.9%
Insurance Status	
Uninsured	89.5%
Medicare	9.3%
Medicaid	<1%
Commercial	<1%
SBP at first recorded visit*	136.7 ±20.4 (mmHg)
DBP at first recorded visit*	82.7 ±12.6 (mmHg)
BMI at first recorded visit*	33.9 ±8.3 (kg/m^2)

* First recorded visit does not represent baseline, since the dataset does not include the first year of the program.

The overall hypertension control rate for patients with at least 6 months follow-up was 61.1%. Table 2 shows hypertension control rates by race, insurance status, and gender. The hypertension control rate was lower in Africans (58.9%) compared to whites (67%). Hypertension control was slightly lower for men than for women (57.7% vs 62.2%). For the uninsured, the control rate was 62%. The control rate was lower (52.1%) in the smaller subpopulation of Medicare patients. Additional analysis (not shown) showed that the hypertension control rates were not sensitive to the cut-off choice for duration of follow-up. Control rates were similar when cut-offs ranging from 3 to 9 months were used.

Table 2: Hypertension Control Rates

		Hypertension Control Rate	
		Uncontrolled	Controlled
All		38.9%	61.1%
By Race:			
	African American	41.1%	58.9%
	White	33%	67%
Insurance Status			
	Uninsured	38%	62%
	Medicare	47.9%	52.1%
Sex			
	Female	37.8%	62.2%
	Male	42.3%	57.7%

DISCUSSION/CONCLUSIONS

The 61.1% hypertension control rate achieved by the HMOP is above the national average of 52% (Chobanian et al., 2003). Nationally, control rates for African Americans and the uninsured are poor (41.7% and 28.7%, respectively) (Gu et al., 2012); control rates for these HMOP subpopulations were 58.9% and 62%, respectively. The HMOP includes a high proportion of women, who typically have higher control rates than men (Yoon et al., 2015). In the HMOP, however, control rates for women were only slightly higher than for men, suggesting that the prevalence of women does not explain its success. Various program features may have contributed to higher control rates. Patient proximity may have contributed to retention, since visits were held in local health departments. Free or reduced-cost medications may have contributed to increased participation or adherence.

Limiting analysis to those with at least 6 months follow-up in the HMOP introduced the potential for selection bias. Those remaining at least 6 months may have been more motivated to achieve control than those who dropped out earlier. Alternatively, patients who achieved control quickly may have discontinued, leaving patients who are more challenging in the study. Patients were enrolled after first visiting their local health center, and thus may have been healthier than the average hypertensive Georgia resident.

This analysis highlights challenges in evaluating program effectiveness retrospectively, when analysis plans were not made at the outset. In this case, lack of access to baseline BP data limited potential analyses. Future programs should define *a priori* plans and metrics for evaluating effectiveness.

Although the limitations above should be considered in interpreting results, this study suggests the HMOP effectuated substantial improvements in hypertension control for patients with otherwise poor control. Long-term outcomes are likely associated with improved quality of life and cost savings due to reduced cardiovascular events, hospitalizations, and rehabilitation.

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