

Sex and Race/Ethnic Differences in Primary Prevention of Atherosclerotic Cardiovascular Disease Among Patients Diagnosed with Hypertension

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Background

Atherosclerotic cardiovascular disease (ASCVD) remains the leading cause of mortality worldwide with over 17 million deaths annually.¹ Patients with hypertension are at a higher risk of developing ASCVD if blood pressure and other risk factors, including HbA1c, low-density lipoprotein cholesterol (LDL-C), statin therapy when indicated, and smoking are not at targets recommended by clinical practice guidelines.

Over the last decade, efforts to control risk factors, through pharmacotherapy and changing lifestyle have led to measurable reductions in ASCVD events.² However, sex and racial/ethnic disparities persist.³ Recent studies show that women are more likely to have delayed care for emergent cardiac illness and have higher in-hospital mortality post myocardial infarction.^{4,5} There is also evidence for racial/ethnic disparities in ASCVD and mortality.^{6,7} Disparities in risk factor control based on sex and ethnic/racial differences leading to ASCVD have not been well-described in primary care among patients free of ASCVD.

Objective

To examine sex and sex-specific racial/ethnic differences in ASCVD risk factor treatment and control among patients with hypertension but free of ASCVD and managed in primary care.

Methods

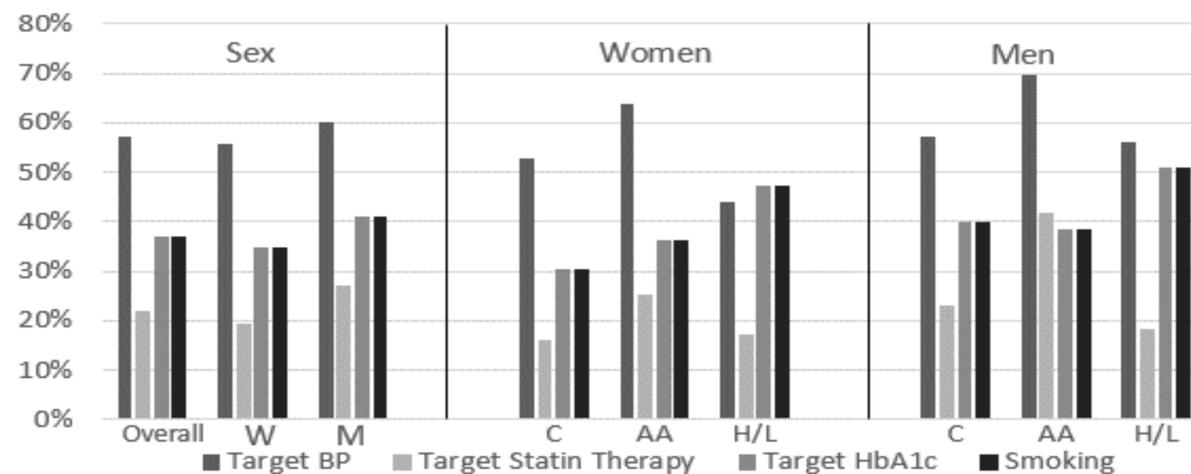
- Patients 18 years and older, diagnosed with hypertension for at least 6 months, prescribed at least one blood pressure lowering medication, and visited a primary care site at least once in 2018 were included.
- Patients who were pregnant or diagnosed with chronic kidney disease or ASCVD defined as acute coronary syndromes, MI, stable or unstable angina, arterial revascularization, stroke, TIA, or peripheral arterial disease of atherosclerotic origin were excluded.
- Hypertension diagnosis was based on the International Classification of Diseases, tenth Revision (ICD-10) codes (I10.x).
- Targets for each risk factor were defined as:
 - Target blood pressure= levels of <130/80 mm Hg⁸
 - Target statin therapy= Moderate- or high-intensity prescription for patient at high risk of developing ASCVD, defined as LDL-C >190, diabetic ages 40-75, and patients 40-75 with a 10-year ASCVD risk >7.5%⁸
 - Target HbA1c= levels of <7%⁸
 - Smoking target= Not smoking
- 10-year ASCVD risk scores were calculated using the ACC/AHA ASCVD pooled cohort risk equations
- Least square means were used to present age-adjusted means for systolic and diastolic blood pressure, LDL-C level, and HbA1c levels. Multivariable Poisson regressions were developed to explore associations between achieving the four targets and sex and race/ethnicity. Model results are presented as adjusted risk ratios (RR) and 95% confidence intervals (CI). Models were adjusted for age, preferred language, diabetes, obesity, years of hypertension diagnosis, and insurance. Analyses were completed using SAS statistical package (release 9.4; SAS Institute Inc, Cary, NC).

Table 1: Characteristics of patients diagnosed with hypertension and managed in primary care

	Women				Men			
	White N=1,915 (55.6%)	African American N=1,187 (34.5%)	Hispanic or Latino N=343 (10.0%)	Overall N=3,445	White N=1,159 (65.0%)	African American N=437 (24.5%)	Hispanic or Latino N=186 (10.4%)	Overall N=1,782
Mean age ±SD	62.7±13.3	58.3±13.4	60.3±13.0	61.0±13.5	59.5±13.1	58.5±12.6	56.1±14.0	58.8±13.1
HTN diagnosis <2 years, N(%)	1,517 (79.2%)	253 (21.3%)	276 (80.5%)	2,727 (79.2%)	941 (81.2%)	341 (78.0%)	160 (86.0%)	1,442 (80.9%)
10-year ASCVD risk ≥7.5%, N(%)	792 (50.7%)	620 (58.7%)	142 (45.8%)	1,554 (53.1%)	651 (67.6%)	363 (90.3%)	106 (62.7%)	1,120 (73.0%)
Obesity, N(%)	1,018 (53.2%)	809 (68.2%)	206 (60.1%)	2,033 (59.0%)	648 (55.9%)	264 (60.4%)	122 (65.6%)	1,034 (58.0%)
Diabetes, N(%)	494 (25.8%)	408 (34.4%)	143 (41.7%)	1,045 (30.3%)	326 (28.1%)	155 (35.5%)	93 (50.0%)	574 (32.2%)
Language, non-English, N(%)	42 (2.2%)	2 (0.3%)	104 (30.5%)	149 (4.3%)	20 (1.7%)	2 (0.5%)	53 (28.7%)	75 (4.2%)
Mean number of visits in 2018 ±SD	4.8±3.6	6.2±4.5	6.2±4.5	5.4±4.1	4.1±2.8	5.7±3.9	5.3±3.7	4.6±3.3
ASCVD Risk Factors*, mean								
Systolic Blood Pressure (mm/Hg)	129.6	134.0	128.5	131.0	131.2	135.2	129.5	132.0
Diastolic Blood Pressure (mm/Hg)	77.2	79.4	75.5	78.0	78.8	81.3	78.3	79.0
LDL-C (mg/dL)	105.4	107.1	102.6	105.9	100.7	99.8	96.9	99.7
HbA1c (%), diabetic	7.0	7.2	7.4	7.2	7.2	7.5	7.7	7.4
HbA1c (%), nondiabetic	5.6	5.8	5.7	5.7	5.7	5.7	5.2	5.6

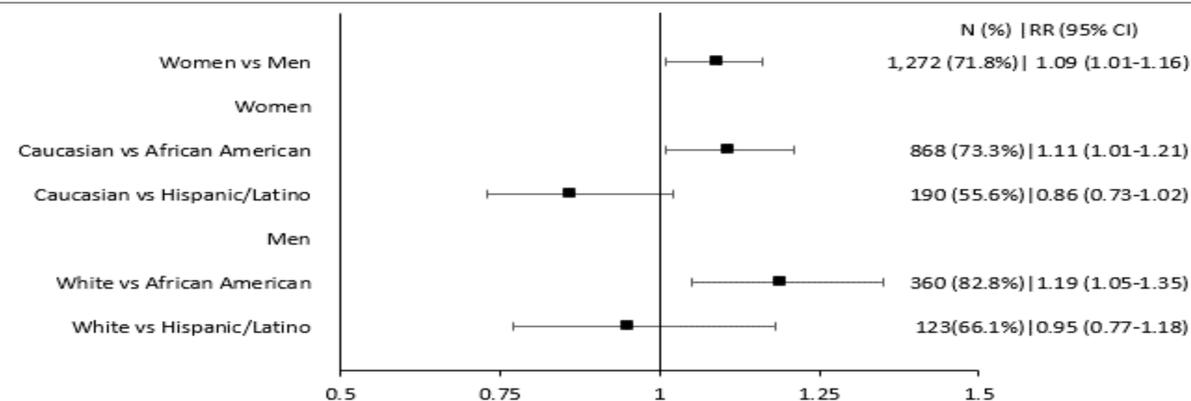
*Age-adjusted mean; HTN= Hypertension; SD= standard deviation; ASCVD= Atherosclerotic cardiovascular disease; LDL-C= low-density lipoprotein cholesterol

Figure 1: Proportion of patients with hypertension who failed to achieved blood pressure, statin therapy, HbA1c, and non-smoking targets, by sex and race/ethnicity



BP=Blood Pressure, W=Women, M=Men, C=Caucasian, AA=African American, H/L=Hispanic/Latino
Blood pressure targets: <130/80 mmHg; statin therapy targets: moderate- or high-intensity statin among patients at high ASCVD risk; HbA1c targets: HbA1c <7%; smoking targets: nonsmoking

Figure 2: Proportion and relative risk of failing to achieve blood pressure, statin therapy, and nonsmoking targets in patients with hypertension, by sex and race/ethnicity



RR= Relative Risk; 95%CI= 95% Confidence Interval

Results

A total of 5,227 patients were diagnosed with hypertension, prescribed at least one blood pressure lowering medication, not diagnosed with ASCVD, and visited a general practitioner in one of 143 primary care clinics in 2018.

Figure 1 presents the proportion of patients who failed to achieve targets for each risk factor.

Overall

- A greater proportion of men failed to achieve statin therapy (27.1% versus 19.5%, p-value <0.01), and smoking targets (13.7% versus 9.3%, p-value <0.01) compared to women.

Women

- Failing to achieve blood pressure targets and statin therapy targets were greatest among African Americans (63.9% and 25.5%, respectively).
- Failing to achieve HbA1c targets was greatest among Hispanic/Latinos (47.2%).
- Failing to achieve nonsmoking target was greatest among Caucasians (10.2%).

Men

- Failing to achieve blood pressure targets, statin therapy, and nonsmoking targets were greatest among African Americans (69.6%, 41.7% and 15.9%, respectively).
- Failing to achieve HbA1c targets was greatest among Hispanic/Latinos (50.9%).

Figure 2 presents the risk of failing to achieve blood pressure, target statin therapy and smoking targets.

Overall

- 66.8% of women and 71.8% of men failed to achieve all targets.

Women

- Among women, African Americans were 11% more likely to fail to achieve the three targets compared to Caucasian women (RR=1.11, 95%CI=1.01 to 1.21).

Men

- African Americans were 19% more likely to fail to achieve the three targets compared to Caucasian men (RR=1.19, 95%CI= 1.05 to 1.35).
- The risk of failing to achieve the three targets was not statistically significantly different between Hispanic/Latino groups and Caucasians but tended to be lower.

Conclusion

Our results highlight disparities in control of ASCVD risk factors in the primary care setting of a large community health care system. Observed disparities were not fully explained by demographic or clinical characteristics. Monitoring of changes in disparities across sex and racial/ethnic groups is important to ensure equity effectiveness as interventions to prevent ASCVD in primary care are developed, tested, and implemented.