

RESEARCH LETTER

# Hypertension Treatment and Control in a New York City Health Care System

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**H**ypertension contributes to socioeconomic and racial and ethnic disparities in potential life-years lost.<sup>1</sup> The prevalence and incidence of hypertension are higher among non-Hispanic (NH) Black versus NH White adults.<sup>1</sup> Hypertension control among those treated for hypertension has been persistently lower for NH Black than for NH White adults of all ages.<sup>2</sup> Recent evidence suggests hypertension control is also lower in Hispanic and Asian populations than among NH White populations,<sup>3</sup> but the evidence in this area is limited.<sup>4</sup> Assessing the racial and ethnic disparities in hypertension prevalence and control in “real world” clinical care settings can be valuable for bridging knowledge gaps and improving health care outcomes. We investigated the prevalence and patient characteristics correlated with hypertension control in the Montefiore Health System, a health system serving predominantly minoritized groups that has an extensive ambulatory care network with 2.8 million visits annually with locations in the Bronx and throughout New York City and the Southern portion of Upstate New York.

The data that support the findings of this study are available from the corresponding author upon reasonable request. Using outpatient care data, we included all individuals with hypertension defined by *International Classification of Diseases, Ninth and Tenth Revisions (ICD-9 and ICD-10)* codes during 2018. Prescribed anti-hypertensive medications determined treatment status (treated versus untreated), which was assessed among all patients with hypertension. Hypertension control

status, based on average measured blood pressure (BP): Joint National Commission criteria (<140/90 mmHg); or American Heart Association/American College of Cardiology criteria (<130/80 mmHg), was assessed among patients treated for hypertension only. We report the distribution of hypertension treatment and control by age, sex, and race, and ethnicity (Hispanic and NH White, Black, or Asian). Socioeconomic status (SES) index scores were calculated<sup>5</sup> and reported as SD from the New York state mean, with lower scores indicating worse neighborhood-level SES. Results are expressed as mean±SD for continuous measures or as number of patients and percentage for categorical measures. Informed consent was waived. The Institutional Review Board of Albert Einstein College of Medicine approved this study.

Among 74 487 patients with hypertension (mean age, 62±14 years), 62% were women and predominantly NH Black (42%) and Hispanic (41%), with 14% NH White and 2% NH Asian. The average SES index score was -2.91±2.90, indicating a low overall SES in the patient population. About 8% of patients were diagnosed with ≥1 clinical comorbidities (eg, myocardial infarction, congestive heart failure, chronic pulmonary disease, diabetes with complications). Overall, 57% of patients were classified as treated for hypertension, of which 57% had achieved BP control by Joint National Commission criteria, and 27% were controlled by American Heart Association/American College of Cardiology criteria.

**Key Words:** control ■ disparities ■ hypertension ■ treatment ■ urban setting

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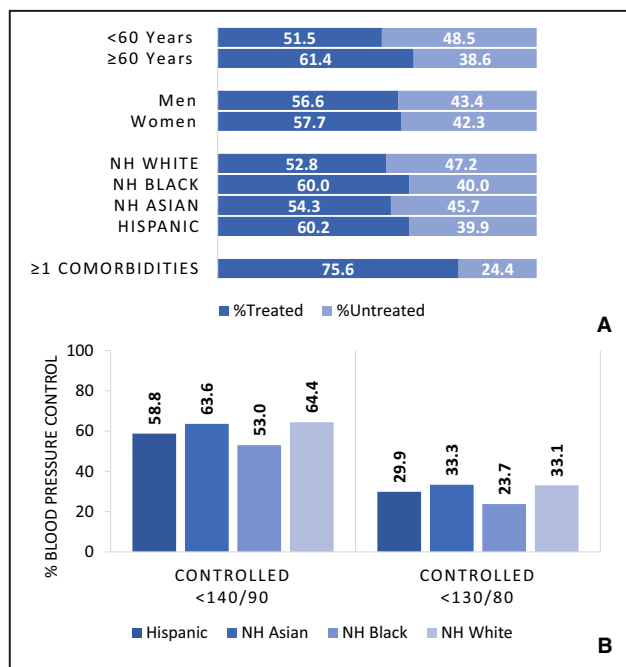
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Sociodemographic characteristics varied by treatment status among the patient population with hypertension. Compared with untreated patients, those prescribed antihypertension treatments were aged  $>60$  years (61%), more likely to be NH Black or Hispanic (60%) and reported  $\geq 1$  comorbidities (76%) (all  $P < 0.0001$ ). Among those treated, the prevalence of BP control by Joint National Commission criteria was lowest for NH Black (53%,  $P < 0.0001$ ) and Hispanic (58%,  $P < 0.0001$ ) patients than for NH White and Asian patients (64%, each), and highest in patients  $\geq 60$  years (63%,  $P < 0.0001$ ) and those with comorbidities (89%,  $P = 0.002$ ) (Figure). Sociodemographic and clinical factors correlating with controlled BP compared with uncontrolled BP among treated patients included higher mean SES index scores ( $-3.0 \pm 2.9$  versus  $-3.2 \pm 2.9$ ), lower mean low-density lipoprotein cholesterol ( $96.3 \pm 36.4$  versus  $101.9 \pm 37.8$ ), lower creatinine levels ( $1.0 \pm 0.8$  versus  $1.16 \pm 1.1$ ), older age ( $\geq 60$  versus  $< 60$  years), and greater likelihood of never smoking (58.0% versus 49.5%); all  $P < 0.01$ . Similar discrepancies were apparent at the 130/80 mmHg threshold. BP treatment and control prevalence was similar in NH Asian and White patients, and BP control characteristics did not vary by sex.

Significant racial and ethnic disparities exist in the prevalence and control of hypertension. Compared with 2015 to 2018 National Health and Nutrition Examination Survey data, our hypertension treatment

and control estimates by Joint National Commission criteria were lower than national estimates.<sup>2</sup> NH White and NH Asian patients with hypertension had better BP control despite lower treatment rates than NH Black and Hispanic patients who had poorer BP control with higher treatment. Differences in the social contexts of our patient population compared with nationally representative samples may explain the divergence between these regional/local estimates and national trends in hypertension treatment and control. The Bronx, where most patients reside, is a unique urban setting characterized by low social resources and income and predominantly Black and Caribbean-Hispanic communities at high-risk for hypertension. Greater social deprivation significantly contributes to poor hypertension control even when hypertension screening and treatment resources are available.<sup>4</sup> Compared with the predominant composition of Hispanic adults of Mexican descent in National Health and Nutrition Examination Survey, our study adds information about the high prevalence of hypertension and the low rates of treatment and BP control within a predominantly Caribbean-Hispanic population in Bronx, NY at higher risk for hypertension. A limitation of our study is the absence of time elapsed between patients' hypertension diagnosis and follow-up care within the Montefiore Health System. We also lacked information on hypertension prescriptions from providers outside the Montefiore Health System network.

The gap between the availability of adequate medical treatment and the realization of improvement in health outcomes can be attributed to causes that fall outside the scope of traditional medical care. Improving hypertension control and reducing disparities require equitable access to high-quality health care, improving patient adherence, and addressing the barriers of social determinants of health and structural racism to achieve healthier lifestyles. Our findings highlight that although it appears we have made strides with hypertension treatment, therapeutic inertia, along with other factors, remain obstacles to addressing inequities in BP control effectively. Our findings are consistent with the data from National Health and Nutrition Examination Survey, where Black adults with hypertension are more likely to be treated but still less likely to be controlled than NH White adults.<sup>3</sup> Developing approaches to address these findings is particularly important in marginalized, low-income communities at higher risk of hypertension-related morbidity and mortality.



**Figure.** Distribution of patient characteristics by hypertension treatment status (A) and percent controlled and uncontrolled hypertension by criteria and racial and ethnic group (B). NH indicates non-Hispanic.

## ARTICLE INFORMATION

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