

Racial Disparities in Hypertension

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The racial disparity in disease outcomes has been recognized for decades. African Americans have higher mortality risks compared with their white counterparts. The life expectancy for African-American men and women is less than that for other Americans. Stroke mortality risks are two-fold greater for African Americans. End-stage renal disease is five times more common for African-American men and women. In addition, the age of onset of diseases such as stroke is considerably earlier for African Americans. For example, a 45-year-old African-American man residing in the Southeast has the stroke risk of a 55-year-old white man in the Southeast and a 65-year-old white man residing in the Midwest.¹ Elevated blood pressures (BPs) are seen in all four race–sex groups, but are more prevalent among African-American men and women.² The increased prevalence and relative risks constitute significant population attributable risks.³ For example, the population attributable risk for hypertension and 30-year mortality among white men was 23.8% compared with 45.2% among black men and 18.3% for white women compared with 39.5% for black women. These excess risks have been long recognized. The Evans County Heart Study,⁴ under the guidance of Dr. Curtis Hames and the Charleston Heart Study⁵ were both initiated in 1960 specifically to study these racial disparities in cardiovascular disease in adults. Similarly, the Bogalusa Heart Study⁶ assessed the racial differences in children and young adults. More recently, the Jackson Heart Study⁷ has been established to assess cardiovascular risk factors in this population.

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Hypertension has been a common denominator in these studies of the excess disease burden for African Americans. In addition to a higher prevalence, individuals in this group are less likely to be aware of their high BP, less likely to have their hypertension medically treated and, subsequently, less likely to have BP under control.⁸ Even among hypertensive individuals being medically treated, African Americans are less likely to have their BP at goal. The prevalence and severity of hypertension has also been documented in other black populations.⁹

Health care providers and policymakers have recognized the racial disparities in hypertension control and hypertension-related outcomes. Identifying specific reasons for the racial differences and developing interventions have been more complicated. In response to this public health burden, many academic centers in the United States have a division or unit devoted to reducing racial disparities in disease. The National Institutes of Health, the Centers for Disease Control, and other federal and state agencies have substantial resources committed to initiatives and investigator-initiated programs to develop interventions focused on reducing disparities in health. Societies such as the International Society of Hypertension in Blacks have been established with this goal. Sessions at the 2005 American Society of Hypertension 20th Annual Scientific Meeting showcased this theme. Research initiatives such as the Black Pooling Project are focused on the assessment of racial differences in risks. Nonetheless, while improvements in racial differences in disease outcomes have been achieved, the racial disparities remain after these interventions.

A key component of the disparity issue is the identification of major factors involved with the association. Epidemiologic studies have failed to identify the “smoking gun.” For example, while body mass index and fat patterning explain some of the racial differences in the prevalence of hypertension, differences remain.¹⁰ Likewise, socioeconomic status



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explains some of the racial differences in BP levels, but African Americans continue to have elevated BP levels in all categories of socioeconomic status.¹¹ Medical care indicators such as access to care and utilizations of care explain part, but not all, of the differences in hypertension and disease rates.¹² Only a portion of the racial difference is explained when considering emerging and novel risk factors such as birth weight (where, for example, African Americans are twice as likely to have a low birth weight).^{13,14}

Results from clinical trials have also shown racial differences in results, suggesting different treatment effects for the various racial groups. Dietary factors such as sodium and potassium, while different for African Americans and whites, do not explain the racial disparities in hypertension. The Dietary Approaches to Stop Hypertension (DASH)^{15,16} diet with sodium restriction, however, was found to result in better BP reduction for African Americans than whites, indicating that black individuals may respond differently than whites. Similarly, with antihypertensive medical treatment, different medications may produce different effects in African Americans and whites. Calcium channel blockers and diuretics have been proposed as being particularly effective for African Americans with hypertension.^{17–19} Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) have not been shown to be as effective in black populations compared with white populations.^{18–20} Similarly, ACE inhibitors, ARBs, and β blockers have been reported to be less effective in blacks with heart failure compared with white patients.²¹

Key considerations in the interpretation of efficacy data are the sample size of the study and variation in other factors. It is critical that observational studies and/or clinical trials include an adequate number of African Americans in the sample for sufficient power to assess racial differences in the effects of therapy or other factors. Likewise, it is critical to assess the racial differences in multiple other factors and characteristics, as these are often the main determinants of BP levels.

As factors associated with racial disparities in hypertension and outcomes remain unclear, continuing epidemiologic studies, in addition to the development of intervention programs to reduce the disparities, should be emphasized. Clinical trials should include adequate samples of African Americans in order for results to be applicable to this segment of the hypertensive population. A major concern in the study of racial disparities and the subsequent development of interventions is the

labeling of risks associated with a defined segment of the population, such as stroke risk being higher in the southeast. A clear socioeconomic association is seen for hypertension in patients with less education. College scholarships are not, however, proposed as an intervention for hypertensive individuals with less than a high school degree. It may be just as inappropriate to label all hypertensive African Americans as nonresponsive to specific classes of antihypertensive therapies, despite data indicating a difference in response rates.

REFERENCES

- 1 Lackland DT, Bachman DL, Carter TD, et al. The geographic variation in stroke incidence in two areas of the Southeastern stroke belt: the Anderson and Pee Dee stroke study. *Stroke*. 1998;29:2061–2068.
- 2 Hajjar I, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1998–2000. *JAMA*. 2003;290:199–206.
- 3 Lackland DT, Keil JE, Gazes PC, et al. Outcomes of black and white hypertensive individuals after 30 years of follow-up. *Clin Exp Hypertens*. 1995;17:1091–1105.
- 4 Keil JE, Sutherland SE, Knapp RG, et al. Mortality rates and risk factors for coronary disease in blacks as compared with white men and women. *N Engl J Med*. 1993;329:73–78.
- 5 Keil JE, Sutherland SE, Hames CG, et al. Coronary disease mortality in black and white men. *Arch Intern Med*. 1995;155:1521–1527.
- 6 Li X, Li S, Ulusoy E, et al. Childhood adiposity as a predictor of cardiac mass in adulthood: the Bogalusa Heart Study. *Circulation*. 2004;110:3488–3492.
- 7 Taylor HA. Establishing a foundation for cardiovascular disease research in an African American community: the Jackson Heart Study. *Ethn Dis*. 2003;13:411–413.
- 8 Lackland DT, Keil JE. Epidemiology of hypertension in African Americans. *Semin Nephrol*. 1996;16:63–70.
- 9 Moser M. Epidemiology of hypertension with particular reference to racial susceptibility. *Ann N Y Acad Sci*. 1960;84:989–999.
- 10 Lackland DT, Orchard TJ, Keil JE, et al. Are race differences in the prevalence of hypertension explained by body mass and fat distribution? *Int J Epidemiol*. 1992;21:236–245.
- 11 Lillie-Blanton M, Parsons PE, Gayle H, et al. Racial differences in health: not just black and white, but shades of gray. *Annu Rev Public Health*. 1996;17:411–448.
- 12 Lackland DT, Lin Y, Tilley BC, et al. An assessment of racial differences in clinical practices for hypertension at primary care sites for medically underserved patients. *J Clin Hypertens (Greenwich)*. 2004;6:26–33.
- 13 Lackland DT, Egan BM, Fan ZJ, et al. Low birth weight contributes to excess prevalence of end-stage renal disease in African Americans. *J Clin Hypertens (Greenwich)*. 2001;3:29–31.
- 14 Lackland DT. Fetal and early determinants of hypertension in adults: implications for study. *Hypertension*. 2004;44:811–812.
- 15 Svetkey LP, Simons-Martin D, Vollmer WM. Effects of dietary patterns on blood pressure: subgroup analysis of the Dietary Approaches to Stop Hypertension (DASH) randomized clinical trial. *Arch Intern Med*. 1999;159:285–293.
- 16 Vollmer WM, Sacks FM, Ard J, et al. Effects of diet and sodium intake on blood pressure: subgroup analysis of the DASH-sodium trial. *Ann Intern Med*. 2001;135:1019–1028.
- 17 Materson BJ, Reda D, Cushman WC, for the Department of Veterans Affairs Cooperative Study Group on Antihypertensive Agents. Department of Veterans Affairs

- single-drug therapy of hypertension study. Revised figures and new data. *Am J Hypertens*. 1995;8:189–192.
- 18 Saunders E, Weir MR, Kong BW, et al. A comparison of the efficacy and safety of a beta-blocker, a calcium channel blocker, and a converting enzyme inhibitor in hypertensive blacks. *Arch Intern Med*. 1990;150:1707–1713.
 - 19 Moser M, Lunn J. Responses to captopril and hydrochlorothiazide in black patients with hypertension. *Clin Pharmacol Ther*. 1982;32:307–312.
 - 20 Weir MR, Gray JM, Paster R, et al. Differing mechanisms of action of angiotensin-converting enzyme inhibition in black and white hypertensive patients. *Hypertension*. 1995;26:124–130.
 - 21 Cohn JN. Contemporary treatment of heart failure: is there adequate evidence to support a unique strategy for African Americans? Pro position. *Curr Hypertens Rep*. 2002;4:307–310.