

## Hypertension Curriculum Review

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## Hypertension in Minority Populations

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*The US population, by percentage, shows a trend toward increased proportions of citizens identified as minorities. Whereas in 2000, according to the US Census Bureau, 71.4% of the population was self-identified as white; this group is expected to decrease to 61.9% by 2025. The proportion of blacks and African Americans from 2000 vs. 2025 is expected to increase from 12.2% to 12.9%. Also, in the smaller population of American-Indian, Eskimo, and Aleutian natives, growth is projected from 0.7% to 0.8%. Asians and Pacific Islanders as a category will become a larger proportion, from 3.9% to 6.2%. The largest increase in proportion will be seen in those identified as Hispanic (of any race), from 11.8% in 2002 to 18.2% in 2025. (J Clin Hypertens. 2006;8:365–368)*

As it relates to hypertension, blood pressure (BP) is largely uncontrolled across all racial/ethnic groups. In non-Hispanic whites, according to the National Health and Nutrition Examination Survey (NHANES), only 24% of treated hypertensives are controlled, similar to non-Hispanic blacks. The level of uncontrolled hypertension is greatest in the Mexican-American population, with only 15% of hypertensives controlled to a BP of <140/90 mm Hg. Furthermore, Mexican-Americans have the largest percentage (41%) of patients unaware of their hypertension compared with 27% of non-Hispanic blacks and 31% of non-Hispanic whites.

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Nevertheless, across all racial/ethnic groups, hypertension is more prevalent in black men and women. When compared with whites at each age range of 18–39 years, 40–59 years, and older than 60 years, blacks have greater hypertension prevalence vs. whites, Hispanics, and others. This disparity in hypertension prevalence for African Americans appears to be greatest in the middle-age years, from 40–59 years. Due to a larger database and greater target organ damage in blacks compared with other racial ethnic minorities, this discussion will predominately describe aspects of hypertension in this group.

## HYPERTENSION IN AFRICAN AMERICANS

There are certain unique characteristics of hypertension in African Americans, with increased morbidity and mortality related to elevated BP. These features include premature onset, increased severity, and increased incidence of target organ damage, including left ventricular hypertrophy, heart failure, and impaired renal function and end-stage renal disease. Although the Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) does not specifically indicate more rigorous goals for BP control in African Americans, the International Society of Hypertension in Blacks (ISHIB) working group report suggested that blacks may need lower target BP (<130/80 mm Hg) vs. <140/90 mm Hg for the general population to avoid the increased risk of cardiac and renal damage. Overall, according to the National Center for Health Statistics, blacks have higher rates of coronary heart disease and stroke mortality. Death rate for blacks due to coronary heart disease is 186.8/100,000 vs. 182.8 for non-Hispanic whites and 124.2 for Hispanics. In addition, stroke, including fatal stroke, is extremely disproportionate in African Americans. Blacks with



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hypertension have an 80% higher risk of dying from a stroke than whites. The mortality rate for stroke is 81.6/100,000 for blacks vs. 60.3 for non-Hispanic whites and 40.0 for Hispanics. It is, perhaps, these disproportionate rates of cardiovascular diseases that explain much of the disparities in life expectancy affecting black men and women. In 2001, it was estimated that African-American men had a life expectancy of 68.6 years vs. 75.0 years for their white counterparts. African-American women have markedly higher death rates when compared with white women, 75.5 vs. 80.2 years life expectancy. In fact, the life expectancy of African-American women more closely approximates that of white men than white women.

Although genetic factors may be a component of the increased risk in prevalence and complications of hypertension in African Americans, clearly there are barriers to hypertension control, several of which are patient-related. These include an individual's lack of awareness of the disease and its consequences, lack of access to patient education, and delayed diagnosis. Furthermore, cardiovascular outcomes are increased by living in disadvantaged communities and having inadequate resources to support healthy lifestyle. Disadvantaged communities often lack safe environments for walking, jogging, or cycling, and neighborhood grocery stores often lack fresh fruits, vegetables, whole grains, and low saturated fat protein sources, including lean meats and fish. Along with poor diet, increased overweight and obesity status, especially in black women, there appears to be a distrust of the medical profession by some blacks and an adverse view of the benefits of medications. All barriers, however, are not related to the patients themselves. Provider-related barriers include lower expectations, lack of specific clinical guidelines for treatment, failure to treat early and aggressively to target BP, and increased prevalence of comorbid diseases, requiring complex medical intervention, perhaps making the control of BP more difficult.

In terms of the underlying pathophysiology of hypertension in blacks, it has been demonstrated that renin-angiotensin system-blocking drugs as monotherapy provide less antihypertensive efficacy in blacks than in whites. The exact physiologic basis of differences in specific antihypertensive agent responses across populations remains difficult to ascertain. However, in some studies, blacks have been shown to have lower plasma renin activity levels, relative expansion of plasma volume, and a higher prevalence of salt-dependent hypertension. There may also be an increase in sodium intake,

decreased potassium intake, obesity, and physical inactivity, along with higher levels of blood sodium and calcium that blunt plasma renin activity. One potential troubling complication of antihypertensive therapy with angiotensin-converting enzyme (ACE) inhibitors in blacks is the increased risk of angioedema. In the, Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack (ALLHAT) trial and other studies, African Americans vs. whites were noted to have two to three times the rate of angioedema with ACE inhibitors. The ALLHAT trial included 35% blacks and compared therapy based on chlorthalidone, amlodipine, and lisinopril. The National Heart, Lung, and Blood Institute (NHLBI) trial was designed to include a significant number of blacks considering the large burden of hypertension-related disease in this population. The primary end point of fatal coronary heart disease and nonfatal myocardial infarction was similar in blacks vs. the general study population. However, in a subgroup analysis, those patients identified as black vs. non-black, there was a 40% increase in the risk of stroke with lisinopril vs. chlorthalidone, 1.4 (1.17–1.68). In terms of strokes, amlodipine and chlorthalidone in blacks had no significant difference in outcomes. It is suggested that much of the difference related to lisinopril and stroke may have been driven by a 4- to 5-mm Hg systolic BP difference, higher in the black lisinopril-based group compared with the chlorthalidone-based therapy. ALLHAT confirmed, again, the benefit of diuretic therapy for BP reduction and cardiovascular risk reduction in African Americans.

The African-American Study of Kidney Disease and Hypertension (AASK) included 1094 self-identified African Americans with hypertension, aged 18 to 70 years, and decreased glomerular filtration rate of 20–65 mL/min/1.73 m<sup>2</sup>. At 21 US centers, patients with hypertensive nephropathy were randomized to therapy with ramipril, metoprolol succinate, or amlodipine. There was also a randomization to usual BP goal (mean arterial pressure 102–107 mm Hg) or lower BP goal (mean arterial pressure ≤92 mm Hg). The results of AASK suggested that in the patients without significant proteinuria, the decline for all treatment groups was comparable. However, in patients with significant proteinuria, the rate of renal function deterioration was slowed with ramipril. Thus, African-American patients with hypertensive nephropathy as in AASK should be significantly benefited, especially if proteinuria is present with treatment with an ACE inhibitor. There was, surprisingly, no difference between usual vs. lower-goal BP.

Despite the renoprotective data from AASK, the cardiovascular benefit of renin-angiotensin system-blocking agents in blacks is confounded by the clinical end point results of the Losartan Intervention For Endpoint Reduction (LIFE) trial. Patients with hypertension and left ventricular hypertrophy were randomized to losartan with diuretics as needed vs. atenolol with added diuretics as needed. Although in the general study population there was benefit in the losartan group for cardiovascular disease, driven primarily by a decrease in stroke, the LIFE trial did not show evidence that the benefits of losartan in hypertensive patients with left ventricular hypertrophy applied to black patients. The result of subgroup analysis (533 of the >9000 study patients) may, however, have been due to chance.

### HYPERTENSION IN HISPANICS

Hispanic is a demographic term denoting a Spanish or Latin family name. Mexican Americans are the largest single Hispanic group, followed by Central and South Americans, Puerto Ricans, and Cuban Americans; Hispanic Americans are a heterogeneous group, composed of mixtures of various races, including blacks, whites, and Native-American populations. In the US, heart disease is the leading cause of death for Hispanics as seen in all racial ethnic groups. Hypertension in Hispanics specifically varies by gender and by country of origin. Despite a greater prevalence of obesity and type 2 diabetes, the prevalence of hypertension in Hispanic Americans appears to be somewhat similar or lower than that seen in the general population. According to NHANES data for men (based primarily on Mexican Americans), the prevalence of hypertension is similar to that of non-Hispanic whites. Nevertheless, in analysis of subgroups of self-identified Hispanics, there appears to be an increase in the risk of stroke in certain populations. For instance, compared with the overall Hispanic population, the risk for stroke is, in certain populations, somewhat increased in Puerto Rican and Mexican-American men. The causes of these differences, based on geographic origin, remain unclear. In the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), there appeared to be no unique blood response to various agents.

### HYPERTENSION IN ASIANS AND PACIFIC ISLANDERS, AND NATIVE AMERICANS

Cardiovascular disease is the leading cause of death in Asian Americans. However, hypertension in patients identified as Asian does not appear to be significantly increased compared with the general population. It should be recognized that similar to Hispanics, Asians

are extremely heterogeneous. Nevertheless, those identified as South Asians (Asian Indians) appear to have an increased number of coronary heart disease events, potentially related to the cardiometabolic syndrome, i.e., insulin resistance, truncal obesity, and dyslipidemia. Interesting, in the recent International Diabetes Federation's (IDF) report, there are specific ethnic values for waist circumference in the diagnosis of the metabolic syndrome.

South Asian, Chinese, and Japanese men had lower cut points for waist circumference as a measure of central obesity. Hence, Asian Americans with short stature may manifest increased cardiovascular risk with apparently lower body weight and waist measurement. An increased prevalence of high BP with excessive abdominal obesity may potentially increase cardiovascular rates seen in South Asians. On the Indian subcontinent itself, hypertension looms as the major public health consideration, and among South Asians living in Western societies, including the US, it is suggested that the prevalence of hypertension, along with coronary heart disease, will increase with time. Prevalence of hypertension in Asia itself is low in rural compared with urban populations. However, as Asians migrate to Westernized countries, the hypertension prevalence is expected to increase. Some other Asian populations may demonstrate higher rates of hypertension, such as in native Hawaiians. Therefore, differences are noted in hypertension rates across various Asian ethnic subgroups. There appears to be a decreased prevalence of hypertension among urban Chinese compared with rural Chinese. Paradoxically, rural Japanese demonstrate higher prevalence rates of hypertension. Much of the variation across the population defined as Asian may be more related to sodium intake and decreased physical activity than clearly identified genetic patterns. Overall, although data are limited in regard to pharmacologic therapy, antihypertensive agents appear to be as effective in Asians as in whites. Interesting drug side effects with ACE inhibitors, including cough and flushing, may be greater among certain Asian subgroups. American Indians or Native Americans as a group are also heterogeneous. Although type 2 diabetes, physical inactivity, and obesity are seen in higher frequency in many American-Indian communities, the prevalence rates of hypertension are similar or perhaps lower than those seen in the general population.

### PRACTICAL APPROACHES TO ANTIHYPERTENSIVE THERAPY IN RACIAL/ETHNIC MINORITIES

Regarding special populations, the JNC 7 suggests that treatment is generally similar for all demographic

groups. Social, economic, and lifestyle factors are extremely important barriers to BP control. The prevalence and severity of hypertension in blacks is clearly higher, and there appears to be reduced response to monotherapy with  $\beta$  blockers, ACE inhibitors, and angiotensin receptor blockers vs. diuretics or calcium channel blockers in blacks. Nevertheless, adding adequate doses of a diuretic usually eliminates these differences. For blacks and all racial/ethnic populations with compelling indications such as heart failure nephropathy or post-myocardial infarction, renin-angiotensin system-blocking agents including ACE inhibitors, angiotensin receptor blockers, and  $\beta$  blockers should be utilized as indicated. For Hispanics, Asians and Pacific Islanders, and American Indians, guidelines should be followed similar to those in the general population, with close attention to the increased prevalence of obesity, the cardiometabolic syndrome, and type 2 diabetes in these populations.

Regardless of race or ethnicity, patients who have complicated hypertension or higher stages of hypertension will usually require two or more medications to achieve BP goals. Specifically, when BP is  $>20/10$  mm Hg above an individual's goal, clinicians should consider initiating therapy with two drugs. Thiazide-type diuretics should be first-line therapy in most patients with hypertension regardless of race or ethnicity, either alone or combined with drugs from other classes. Thus, starting combination therapy, especially in patients with complicated hypertension or higher grades of high BP may increase the likelihood of a successful achievement of BP goal.

JNC 7 recommends therapeutic lifestyle changes and drug therapy to lower BP in all populations. Multiple medications are usually required and more aggressive screening and comprehensive culturally sensitive management may increase BP control

and decrease mortality and morbidity, especially in African Americans, but also in Hispanics and other racial ethnic groups. Racial ethnic-based disparities in hypertension and cardiovascular disease are well documented, driven by social, economic, and health system factors, potentially beyond genetic considerations alone. In the final analysis, the importance of conventional risk factors, including hypertension across all racial and ethnic populations, determines the overall level of cardiovascular disease.

#### SUGGESTED READING

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