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Hypertension in black people: pathophysiology and therapeutic aspects

AA Lopes
Department of Medicine, Faculdade de Medicina da Universidade Federal da Bahia, Salvador, Brazil

Salt sensitivity is regarded as an important contributor to the higher risk of hypertension in black people as compared with whites. This finding is in agreement with a better response to diuretics than to monotherapy with angiotensin-converting enzyme (ACE) inhibitor in black subjects. It is important to remember that the hypotensive effect of ACE inhibitor is augmented in patients on a thiazide diuretic. Moreover, the antihypertensive response to a specific drug varies among black patients. Thus, ACE inhibitors should also be viewed as important options to treat hypertensive black subjects. Results from clinical trials support an emphasis on lifestyle modification and a more intensive blood pressure lowering by pharmacological interventions to reduce the large black–white gap in cardiovascular events and end-stage renal disease (ESRD) attributed to hypertension.
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Introduction

The prevalence/incidence of hypertension and the risk of target organ damage (TOD) are higher among black subjects than among whites.[1,2] Interactions between biological and behavioural factors and mechanisms initiated during the fetal life (but not necessarily genetic) have been suggested as related to the black/white differences in hypertension.[1,3] This article summarises differences between black and white subjects in the mechanisms of blood pressure (BP) control and in the pathogenesis of hypertension. It also reviewed studies that assessed the effects of lifestyle modification and pharmacological interventions in the control of high BP in black subjects.

Peculiarities in the pathogenesis of hypertension in black subjects

More black than white people present a rise in BP with salt loading and a decrease with salt restriction, ie, salt sensitivity.[4] Consistent with the salt sensitivity, the levels of renin and angiotensin are on average lower in black than in white subjects.[5] Salt sensitivity has also been associated with ventricular hypertrophy and hypertensive nephropathy, complications more often detected in blacks than in whites.[6,7] Evidence suggests that dietary salt modulates renal production of transforming growth factor (TGF)-beta, a growth factor that has been linked to hypertension-related cardiorenal complications.[8] TGF-beta was found to be hyperexpressed in black patients with hypertension.[9] Alterations in the renal haemodynamics may also contribute to the higher risk of hypertensive nephropathy in black subjects.[10,11]

Treatment of hypertension in black patients

Lifestyle modification is recommended for all hypertensive patients.[12] In the Dietary Approaches to Stop Hypertension (DASH) study[13] it was found that a diet rich in fruits, vegetables, and low-fat dairy foods, and reduced in saturated fat, total fat, and cholesterol was significantly associated with a reduction in systolic and diastolic BP, particularly among black subjects. Dietary supplementation of potassium,[14] weight loss[15] and aerobic exercise[16] are also associated with reduction in BP among black people. Compared with whites, blacks have a better response to diuretics (particularly older blacks) and calcium antagonists and a smaller response to ACE inhibitors.[17] It is important to note, however, that angiotensin-converting enzyme (ACE) inhibitors block the effects of TGF-beta and are effective in reducing hypertensive complications that occur more often in blacks than in whites with hypertension.[12,18] Moreover, the hypotensive response to ACE inhibitors in black subjects is augmented when they are on thiazide diuretics.[19] The vasopeptidase inhibitors are a new class of drugs that may also contribute to reduce the black–white gap in hypertensive complications. They inhibit both the neutral endopeptidase (NEP) and the synthesis of angiotensin II. The NEP inhibition contributes to natriuresis

Correspondence: AA Lopes, Rua Mar. Floriano 448 apt 1301, Canela, Salvador-BA,CEP: 40110-010, Brazil
E-mail: aaslopes@ufba.br

by blocking the inactivation of natriuretic peptides. This specific effect of the NEP inhibition may perhaps explain why black subjects were found to have a better response to sampatrilat (a vasopeptidase inhibitor) than to lisinopril (an ACE inhibitor).[20] Based on the existing evidence it is recommended a goal BP below 130/85 mm Hg for patients with diabetes and renal failure and below 125/75 mm Hg in patients with proteinuria >1g/dl.[12] Physicians taking care of hypertensive patients should remember that black patients are more often in these subgroups of higher risk patients who deserve a more intensive lowering of BP. An ongoing clinical trial, 'African American Study of Kidney Disease and Hypertension' was developed to assess whether a reduction in the mean arterial pressure to a level below 92 mm Hg decreases the risk of ESRD in black patients. This study also compares the effects of antihypertensive drugs (beta-blocker, ACE inhibitor and calcium antagonist) on the prevention of ESRD in black patients.[21] The results of the AASK trial should contribute to a better understanding of how to treat hypertension in black patients at high risk of developing ESRD. More research, however, is still needed to find better strategies to reduce the risk of hypertension and prevent TOD in black subjects.

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