The Challenge of Global Hypertension -- Evolving British Guidelines, African Approaches, and Epidemiologic Risk Categories

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Introduction

Although the precise medical definition of "hypertension" continues to be the subject of discussion, there is no question that the problem of elevated blood pressure poses a real challenge to world health. Thus, this month, 6 British professional societies have cooperated to issue the Joint British Societies (JBS 2) updated guidelines, broadening the definition of risk, but with treatment recommendations still under review. Concurrently, a special issue of Circulation focused on heart disease in Africa, with reports from the First Pan-African meeting on hypertension held in Cameroon last December. Epidemiologically, this month saw reports about the difference in ACS outcomes following intervention in women vs men, about risk in young men born prematurely, and about cognitive deficits associated with aging and hypertension. For treatment, there were reports of results of plant-based vs red-meat-based diets, and an intriguing finding about hot weather, nighttime, and SBP levels -- and why a common prescribing practice should be changed. Finally, the AHA has nominated the link between prehypertension and heart disease, reported here last September, as a major research advance of 2005.

New British Guidelines for Cardiovascular Disease Prevention Set Blood Pressure Goals, But Treatment Still Under Review

New joint guidelines published by 6 UK professional societies in the December 2005 issue of the journal Heart(1) have expanded the criteria for the prevention of cardiovascular disease and stroke in primary care by setting new targets for lifestyle, blood pressure, lipids, and glucose. The aim of the new Joint British Societies' guidelines (JBS 2) -- developed by the British Cardiac Society, British Hypertension Society, Diabetes UK, HEART UK, Primary Care Cardiovascular Society, and The Stroke Association -- is "to promote a consistent multidisciplinary approach to the management of people with established atherosclerotic cardiovascular disease and those at high risk of developing symptomatic atherosclerotic disease."

The guidelines say that cardiovascular disease prevention in clinical practice should focus "with equal priority" on people with established atherosclerotic disease, people with type 1 or 2 diabetes, and apparently healthy individuals at high risk (cardiovascular disease risk > 20% over 10 years) of developing symptomatic atherosclerotic disease. All these people should have "professional lifestyle and multifactorial risk factor management to defined lifestyle and risk factor targets" (emphasis as in the guidelines). All other people with "particularly elevated" single risk factors should also be treated. These include people with:

- Elevated blood pressure: systolic blood pressure (SBP) ≥ 160 mm Hg, diastolic blood pressure (DBP) ≥ 100 mm Hg, or lesser elevations with target organ damage

- Elevated total cholesterol to high-density lipoprotein-cholesterol ratio ≥ 6.0
The guidelines also recommend that all adults aged ≥ 40 years with no history of cardiovascular disease or diabetes not already on antihypertensive or lipid-lowering drugs and all adults younger than 40 years with a family history of premature atherosclerotic disease should be screened for cardiovascular disease.

All high-risk individuals should be urged to stop smoking, make healthier food choices, increase aerobic activity, and achieve optimal weight and weight distribution. The guidelines include therapeutic targets and treatment recommendations for blood pressure, blood cholesterol, and blood glucose. The blood pressure recommendations reflect those of the British Hypertension Society’s (BHS) most recent guidelines (BHS-IV). The optimal blood pressure target is defined as < 140 mm Hg SBP and < 85 mm Hg DBP, although in people with established atherosclerotic disease, diabetes, and chronic renal failure, lower targets of SBP < 130 mm Hg and DBP < 80 mm Hg, respectively, are deemed more appropriate. An "audit standard" of < 150/90 mm Hg (< 140/80 mm Hg for higher-risk individuals) is recommended as a minimum standard of care, before optimal treatment targets are achieved. The optimal total cholesterol target is defined as < 4.0 mmol/L plus LDL-cholesterol < 2.0 mmol/L or a 25% reduction in total cholesterol plus a 30% reduction in LDL-cholesterol. Optimal fasting glucose is defined as ≤ 6.1 mmol/L.

Treatment for elevated blood pressure in high-risk patients is likely to involve combinations of antihypertensive drugs, the guidelines acknowledge. They recommend following the BHS's AB/CD treatment algorithm introduced in BHS-IV. This algorithm is based on the theory that hypertension can be classified as "high renin" or "low renin" and is best treated initially with either drugs that inhibit the renin-angiotensin system (ie, angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers [A] or beta-blockers [B]) or those that do not (ie, calcium channel blockers [C] or diuretics [D]). Patients who require more than 1 drug may receive any combination of A or B with C or D.

As noted by the guidelines authors and by the BHS,[3] however, hypertension treatment recommendations are currently under review by the BHS in collaboration with the National Institute for Clinical Excellence (NICE), the independent organization responsible for providing national guidance on treatments in England and Wales that published a separate hypertension guideline in 2004.[4] The joint review is focusing on the role of beta-blockers in treatment following publication of trials such as the blood pressure arm of the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT-BPLA) and the Losartan Intervention for Endpoint Reduction in Hypertension (LIFE) study, both of which showed an increased risk of new-onset diabetes in patients on beta-blockers, especially when combined with thiazide-type diuretics (B plus D).

As well as recommending statins for all individuals at high risk and for most individuals with diabetes, the guidelines include recommendations for antithrombotic therapy including aspirin or clopidogrel. The guidelines are to be distributed to all general practitioners. Cooperation with hospital specialists and long-term management of high-risk patients are emphasized.

Local Experts Focus on Problems of Detecting and Treating Hypertension in Africa

Last month, the diagnosis and treatment of hypertension in African countries received special attention, highlighted in a special section devoted to "heart disease in Africa" in the American Heart Association's journal Circulation and on the occasion of the First Pan-African meeting on Hypertension, which took place December 2-5, 2005 in Yaoundé, Cameroon.

Africa is in "epidemiological transition," due to a move by many people from a rural to an urban lifestyle, bringing with it "advances of civilization" such as an increased cardiovascular disease burden, several authors noted. Hypertension in Africa is a widespread problem of immense economic importance because of its high prevalence in urban areas, its frequent underdiagnosis, and the severity of its complications. For example, the INTERHEART Africa study has shown that hypertension is the strongest risk factor for myocardial infarction (MI) in black Africans, with an odds ratio of 6.99 compared with 2.3-3.9 in other ethnic groups.[7] The latest estimate of the World Health Organization (WHO) is that more than 30 million people in Africa have hypertension. WHO predicts that if nothing is done about it, by 2020 three quarters of all deaths in Africa will be attributable to hypertension. The African Union has called hypertension "one of the continent's greatest health challenges after AIDS."

In Circulation, 2 South African researchers, Lionel H. Opie, MD, DPhil (University of Cape Town) and Yackoob K.
Seedat, MD, PhD (University of KwaZulu Natal, Durban), focused on hypertension in Sub-Saharan Africa. With Sub-Saharan Africa's population of 650 million and increasing longevity and westernization, "hypertension has now changed from a relative rarity to a major problem," they noted. It has been estimated that in Sub-Saharan Africa, 10-20 million people have hypertension, although Profs. Opie and Seedat believe that this may be an overestimation, pointing to the difficulties of estimating the prevalence of hypertension in Africa. They also noted that the shortened life span due to HIV/AIDS has eliminated the normal age-related blood pressure increase seen in many African countries. They have reservations about applying proposals about hypertension in black Americans to Africans living in Africa, and even about applying proposals for one African group to another elsewhere in Africa. They believe that environmental rather than genetic factors may account for observed differences in hypertension between black and white hypertensives.

There have been no truly large-scale randomized outcome studies in black Africans, they note. Overall, other clinical studies have shown only absolute relative differences between black and white patients in the effects of various classes of antihypertensive drugs, and choice of agent should be made on the basis of risk factor evaluation in the individual patient. The most important barriers to hypertension diagnosis and treatment are "inadequate funds, inexperience, and lack of infrastructure," Profs. Opie and Seedat said. This is such a vast problem that it is, at least in part, a political problem, they emphasized. Preventive measures depend on government participation in campaigns to transmit messages about lifestyle changes such as reducing dietary salt, achieving weight loss, and smoking cessation, and support from international cardiology organizations for "an active approach to hypertension."

The financial burden of treating hypertension in African countries has been addressed by Thomas A. Graziano, MD (Harvard Medical School) and other researchers in Boston, Massachusetts, and Cape Town. Using a simulation model based on the current multiethnic South African population, Dr. Graziano and colleagues conducted a cost-effectiveness analysis comparing 2 approaches to treating hypertension in the prevention of cardiovascular disease. They calculated that using an approach based on treating everyone with an absolute risk of > 15% could save South African society up to US $500 million over 10 years compared with treatment according to current guidelines based on blood pressure levels. The absolute risk-based approach has been adopted in the United Kingdom and New Zealand, whereas current South African hypertension treatment guidelines are based on the sixth and seventh reports of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI and JNC 7).[9,10]

The First Pan-African Congress on Hypertension was set up by the International Forum for Hypertension control and prevention in Africa (IFHA), which also published the first guidelines for the management of hypertension and cardiovascular risk in Sub-Saharan Africa in 2003. The theme of the congress was "averting a hypertension pandemic in Africa." Participants said that to face the challenge, Sub-Saharan African countries must train health teams capable of assessing epidemiologic situations and promoting clinical management of hypertension and other conditions related to cardiovascular disease. Healthcare providers must be made more aware of the burden of hypertension in Africa, as well as the need to review current patterns of prevention, diagnosis, and treatment. Healthcare professionals' knowledge of cardiovascular disease and stroke prevention and control needs to be improved, and a campaign for understanding and combatting hypertension is needed.

So that such campaigns can be initiated locally, all physicians attending the congress were issued a basic kit to take home. The kit consisted of a blood pressure meter, a measuring tape (for waist circumference), personal scales, and a glucometer. Delegates were taught how to use the kit. Unlike in developed countries, hypertension in Africa is usually treated by specialist cardiologists, but the congress hoped to extend this responsibility to general physicians and registered nurses by producing different types of publications and courses adapted for each group.

The difficulty of paying for antihypertensive drugs was addressed by Marc Twagirumukiza, MD (University Hospital, Butare, Rwanda). "In most Sub-Saharan African Countries, medicines are paid out of pocket by individual patients, rather than being subsidized through social insurance. The price of drugs is therefore a major obstacle to adherence to long-term treatment with agents such as antihypertensives, but too little is known about the prices paid for medicines in low income countries," Prof. Twagirumukiza said.

The congress also examined ways to bridge the gap between scientific evidence and policy in poor resource settings, creating "enabling environments" for cooperation between hypertension experts in Africa and overseas.

Women With ACS More Likely to Be Hypertensive Than Men, Treated More Aggressively, But
With No Better Result

Researchers have found that among acute coronary syndrome (ACS) patients enrolled in 2 large international clinical trials, the prevalence of hypertension was higher in women than in men, but although the hypertension in the women was treated more aggressively, blood pressure control was no better than in the men.[17] The impact of hypertension on mortality or recurrent cardiac events was similar in men and women, which led the researchers to conclude that "opportunities exist to improve medical therapy and outcomes in women with hypertension."

Kristin Newby, MD, MHS (Duke University Medical Center, Durham, North Carolina), and colleagues analyzed the prevalence of hypertension and medical treatment from case reports of the 15,904 patients randomized in the Sibrafiban versus Aspirin to Yield Maximum Protection from Ischemic Heart Events Postacute Coronary Syndromes (SYMPHONY) and SYMPHONY II trials at 931 centers in 37 countries. The SYMPHONY trials compared the efficacy of the oral glycoprotein IIb/IIIa receptor antagonist sibrafiban to that of aspirin in preventing secondary ischemic events or death in patients stabilized after ACS (ST-segment elevation or non ST-segment elevation MI or unstable angina) over 90 days. Patients with SBP > 180 mm Hg or DBP > 100 mm Hg were excluded from both SYMPHONY trials. Dr. Newby and colleagues determined the prevalence of hypertension before the acute coronary event that led to enrollment in the SYMPHONY studies and subsequent treatment and adverse clinical outcomes in these hypertensive patients. A separate analysis was carried out involving the 2091 women and 5084 men enrolled in the SYMPHONY trials in the United States.

Although the overall prevalence of hypertension among these ACS patients varied from 50.4% in Western Europe to 68.4% in Eastern Europe and Asia, the prevalence in all regions was higher in women than in men. This difference was seen at all ages. In the US cohort, 63% of women had hypertension compared with 50% of the men. Women with hypertension tended to be older, had reduced kidney function, and more often had diabetes and a history of heart failure compared with men. However, they were less likely to have had an MI and to undergo coronary angiography.

In the United States, women were more likely to be on multidrug antihypertensive regimens than men, with 16% of women receiving ≥ 3 drugs compared with 13% of men, and 25% of women on 2 drugs vs 30% of men. Both at presentation and at discharge, women were more likely to be taking diuretics and calcium channel blockers and men were more likely to be on beta-blockers. Use of ACE inhibitors was similar in men and women, although women were more likely to receive an ACE inhibitor as a single agent. After adjustment for comorbid conditions that may have affected prescribing, diuretics were the only treatment associated with gender. Dr. Newby and colleagues say they cannot account for this.

Although women in the US cohort were treated with a greater number of antihypertensive agents than men, they did not achieve better blood pressure control. SBP at presentation was 150 mm Hg in women vs 147 mm Hg in men, and even after treatment for ACS, SBP remained higher in women (126 mm Hg vs 124 mm Hg in men). In addition, women were 2.4 times more likely to die within 40 days than hypertensive men, although after multivariable adjustment, the independent association of hypertension with mortality was found to be similar in women and men. Women were more likely to experience the composite endpoints of death or MI; death, MI, or severe recurrent ischemia; and death, MI, or stroke significantly more often. After adjustment for age and comorbidities, these differences were no longer significant, but there was a trend toward increased cardiovascular risk in women compared with men. Despite their higher risk of adverse clinical outcomes, hypertensive women were less likely than hypertensive men to receive evidence-based medications for treatment of their ACS (eg, heparins, aspirin, beta-blockers, and statins).

At the time of the first presentation of these results, at the 2003 Annual Scientific Sessions of the American Heart Association in Orlando, Florida. Dr. Newby said that "it is not clear if women are not getting the right medicines, are getting them in the wrong doses, or if other factors are responsible for the need for more medications in women to attain similar control." She added that physicians need to be aggressive in treating hypertension, whether their patients are male or female.

Young Men Born Prematurely May Be at Greater Risk for Hypertension

Young men who were born prematurely may have an increased risk of high blood pressure, according to a Swedish study reported in Circulation.[18] In a population-based cohort study, the risk of high blood pressure was particularly high among young men who were born at least 8 weeks early. "The association between preterm birth and high blood pressure is unlikely to be explained by family history or genetic factors," said lead author Stefan Johansson,
MD (Karolinska University Hospital, Stockholm). "Instead, early environmental challenges faced by the premature baby may affect development permanently, contributing to higher blood pressure in adulthood."

The researchers examined 4 population-based Swedish registries to collect data on 329,495 Swedish men born between 1973 and 1981 and conscripted for military service between 1993 and 2001. During assessment for conscription, they underwent a physical examination, including measurement of blood pressure. A large proportion (20%) of the men had high SBP (≥ 140 mm Hg), varying from 32% in men born extremely preterm (≤ 28 weeks) to 19% among men born post-term (≥ 42 weeks).

Analyses adjusted for perinatal, maternal, and socioeconomic factors showed that compared with men born full-term (gestational age 37-41 weeks), the risk of high SBP:

- Was almost 2-fold in men born extremely preterm (24-28 weeks)
- Was increased by 48% in men born very preterm (29-32 weeks)
- Was increased by 25% in men born moderately preterm (33-36 weeks).

Being born small for gestational age (SGA) also was associated with a 10% increased risk for high SBP compared with being born appropriate for gestational age. Adjusted analyses showed that being SGA was associated with an increase in high SBP only among men born ≥ 33 weeks. The researchers stress that SGA and preterm birth represent different clinical entities, and their relative contributions to high SBP are not easily compared.

Risk of high DBP (≥ 90 mm Hg) increased with decreasing gestational age, but the increase was significant only among men born moderately preterm. Overall, the results for DBP in this study were less consistent than those for SBP, which the researchers suggest may have been due to the low incidence of high DBP in the study cohort or to the fact that SGA has less effect on the risk of high DBP compared with high SBP.

Dr. Johansson and colleagues noted that their study, which is the largest study of its kind to date, was based on people who were born when modern neonatal care was developing rapidly and survival rates for preterm infants were increasing. They also stress that their conclusions should be restricted to men. They do not suggest any causes for the association between preterm birth and high blood pressure. However, they recommend that children born very preterm should have their blood pressure checked during their clinical follow-up programs. "It may also be even more important for people born preterm to have a healthy life-style and to manage known risk factors of cardiovascular disease, such as smoking," Dr. Johansson suggested. In Sweden, about 6% of pregnancies end preterm. The corresponding figure in the United States is reported to be as high as 12%.

Uncontrolled Hypertension Associated With Cognitive Defects Beyond Those Attributable to Age

New research suggests that older men with uncontrolled hypertension may be at higher risk for sharper decreases in cognitive function than people with normal blood pressure. Researchers at the Veterans Affairs Boston Healthcare System, Harvard Medical School, and the Boston University School of Public Health found that a sample of hypertensive older men did significantly worse on specific cognitive tests than normotensive subjects and that these cognitive deficits could not be attributed to the "normal" effects of aging alone. This study appears in the November issue of Neuropsychology,[19] a journal published by the American Psychological Association.

The men in the study came from the Veterans Normative Aging Study, a longitudinal study that started in 1963 and added neuropsychological tests in 1993. The study sample comprised 357 men, average age 67 years, who lived in the community and had no medical comorbidities such as cardiovascular disease, diabetes mellitus, stroke, or dementia; their blood pressure levels were stable over a period of ≥ 3 years. They had undergone at least 1 of a neuropsychological battery of tests during the period from 1993 to 1995. The battery was analogous to the Consortium to Establish a Registry for Alzheimer's Disease (CERAD) battery, with additional measures. Two hundred and fifty of the men had normal blood pressure, 34 had controlled hypertension, 75 had untreated hypertension, and 45 had uncontrolled hypertension. Hypertension was defined as SBP ≥ 140 mm Hg, DBP ≥ 90 mm Hg, or taking antihypertensive medication. Men who would have been classified as prehypertensive according
to JNC 7[12] were categorized as normal, since JNC 7 does not recommend treatment for men with SBP in this range and no other risk factors such as those excluded in the study.

The researchers found that overall neuropsychological performance declined with age. However, older men in the sample with uncontrolled hypertension did significantly worse on specific tests of verbal fluency (generating words in a given category) and immediate recall of a word list (short-term memory). The uncontrolled hypertensives' decrements on fluency were 2.4 times greater than for those with normal blood pressure, and their decrement with immediate recall was 1.3 times greater. By the age of 80 years, men with uncontrolled hypertension could generate 7 fewer words in a given category and recall about 1.5 fewer words on average than the other 80-year-old men in the study.

There was no evidence to suggest that antihypertensive drugs adversely affected cognition, since the men whose hypertension was controlled on drug therapy in this study did as well on neuropsychological testing as did the men with physiologically normal blood pressure.

Lead author Christopher B. Brady, PhD (VA Boston Healthcare System and Harvard Medical School), and colleagues speculate that high blood pressure may exacerbate age-related effects on retrieval processes mediated by the frontal lobes.

The authors also suggest that the actual proportion of cognitive problems among older adults with uncontrolled hypertension in the general population may be greater than seen in their study, because the hypertensive men in their study had no other health problems.

**More Plant Food and Less Meat Could Prevent Hypertension in Young Black and White Adults**

Young adults could prevent the development of hypertension by increasing their intake of plant food, such as whole grains, fruit, and nuts, and by reducing their consumption of red and processed meat, according to the results of a new US study published in the December 1 issue of *The American Journal of Clinical Nutrition*.[20]

Lyn M. Steffen, PhD, MPH (University of Minnesota, Minneapolis), and colleagues analyzed data from 4304 participants in the Coronary Artery Risk Development in Young Adults (CARDIA) study to determine the associations of plant food, dairy products, and meat with the 15-year incidence of hypertension.[21] The CARDIA study participants are black or white men and women aged 18-39 years in 1985/1986 who have been followed for 15 years to study cardiovascular disease risk evolution.[22] The participants had clinical examinations at Years 0, 2, 5, 7, 10, and 15, and dietary assessment at Years 0 and 7. Clinical centers are located in Birmingham, Alabama; Chicago, Illinois; Minneapolis, Minnesota; and Oakland, California.

Over 15 years, 23.2% experienced "elevated blood pressure" (SBP ≥ 130 mm Hg, DBP ≥ 85 mm Hg, or the use of antihypertensive medication), of whom 13.7% developed hypertension (SBP ≥ 140 mm Hg, DBP ≥ 90 mm Hg, or use of antihypertensive medication) and 9.4% developed high-normal blood pressure (SBP 130-139 mm Hg, DBP 85-89 mm Hg). Almost two thirds of the participants who developed elevated blood pressure were black.

Intake of plant foods (whole grains, refined grains, fruit, vegetables, nuts, or legumes) was inversely related to elevated blood pressure after statistical adjustment for race, gender, baseline age, education, center, total energy intake, cardiovascular risk factors, and other potentially confounding factors. Women and whites were found to consume more plant foods than men and blacks, as did older participants and those with higher levels of education compared with those who were younger and had less education. Those who ate the most plant foods had a 36% reduction in their risk of developing elevated blood pressure. Consumption of dairy products was not related to elevated blood pressure, there was no association between poultry or fish and elevated blood pressure, and eggs showed an inverse relation.

Further analysis showed that eating red and processed meat ≥ 1-2 times/day was associated with a 20% to 40% higher risk of developing elevated blood pressure than consumption of red meat < 0.6 times/day. Consumption of eggs ≥ 1-3 times/week was associated with an 11% to 21% lower risk of developing elevated blood pressure.

Dr. Steffen and colleagues suggest that plant foods and milk may exert their benefits on blood pressure through the...
nutrients they contain, such as fiber, magnesium, potassium, and calcium, whereas meat may contain higher amounts of saturated fat, sodium, nitrates, or other compounds that are detrimental to blood pressure. They also suggest that meat tends to replace other foods such as whole grains, fruit, and vegetables in many people’s diets.

**Blood Pressure Reduced in Hot Weather, But SBP Increases at Night**

For the first time, hot weather has been linked not only to reduction in daytime blood pressure but also to increased SBP at night, especially in elderly people with high blood pressure, Italian researchers reported in the February issue of *Hypertension*. The report suggests that blood pressure should be more closely monitored during hot weather, but also that antihypertensive medication should not be reduced during hot-weather months. It seems this is a common practice in countries with hotter climates, although it is not recommended in any guidelines.

Daytime blood pressure readings have been shown to fall in hot weather, and these lower blood pressure levels are thought to be the reason why fewer people overall have stroke during this time, although strokes do not decline among the elderly. Because few data were available about the effects of changes in air temperature on ambulatory blood pressure (ABP), the researchers investigated climate-related changes in clinic and ambulatory blood pressure during a 4-month period. Pietro Modesti, MD, PhD, and colleagues examined records of 6404 people (average age, 59 years) who underwent 24-hour ABP monitoring between October 1999 and December 2003 at hospitals in Florence and Milan, Italy. Data on air temperatures during this period were obtained from records at local offices of the National Climatic Data Observatory. A day was rated as hot if the 24-hour average temperature was in the highest 10% recorded during the study period (25.5°C to 32.5°C/77.9° to 90.5°F), cold if the average was in the lowest 10% (-0.7° to 6.2°C/30.7°F to 43.2°F), and intermediate if it fell in between. No information was available on air temperatures inside people’s homes, but air conditioning is not widely used in Italy, according to Prof. Modesti.

Clinic and average 24-hour ABP measurements of SBP were significantly lower (averaging 136 mm Hg and 130 mm Hg) in hot weather and significantly higher (averaging 141 mm Hg and 133 mm Hg) in cold weather than on days with intermediate temperatures (averaging 138 mm Hg and 132 mm Hg). The morning blood pressure surge was also significantly lower in hot weather and higher in cold weather. However, nighttime 24-hour ABP and SBP showed an opposite relationship to temperature, with hot days associated with higher nighttime pressure.

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In patients aged > 65 years treated for hypertension (blood pressure > 140/90 mm Hg), nighttime blood pressure was significantly higher on hot days than on cold days (134 mm Hg vs 129 mm Hg). Air temperature was an independent predictor of higher nighttime pressure. In younger subjects and elderly subjects not under treatment for hypertension, the difference in nighttime blood pressure between hot and cold weather was not significant.

Prof. Modesti and colleagues suggest that the practice of down-titration applied to antihypertensive drug regimens during hot-weather seasons in some countries might reduce the duration of treatment effects, resulting in insufficient 24-hour SBP coverage.

Researchers found that the number of different antihypertensive drugs taken by subjects aged > 65 years was significantly lower (average, 1.71) on hot days than on cold days (2.30). There was no relationship between temperature and the number of medications used by hypertensive patients aged < 50 years. "Physicians should reconsider reducing blood pressure medication in the summer, particularly without first using ambulatory monitoring to assess nighttime blood pressure," Prof. Modesti said.

The blood pressure increase seen in the elderly could increase the risk for both target organ damage and acute cardiovascular events, the researchers believe. This would counterbalance the favorable effect of an air temperature-related reduction in daytime blood pressure.

The researchers also noted that air temperature should be considered in hypertension clinical trials. "If you enroll patients into a drug trial without considering the season, you could introduce bias," Prof. Modesti pointed out.

**American Heart Association Nominates Report of Link Between Prehypertension and Heart Disease as Major Research Advance of 2005**

The American Heart Association (AHA) has selected as one of its top 10 research advances in heart disease and stroke for 2005 the report that people who are prehypertensive are at increased risk of MI and coronary artery disease (CAD). Created in 1996, the AHA’s annual top 10 list highlights the year’s "major gains" in heart disease and
stroke research.

As reported in the September issue of Stroke,[25] Adnan I. Qureshi, MD, and colleagues at the University of Medicine and Dentistry of New Jersey (Newark) and Ohio State University (Columbus) analyzed data from the Framingham Study and calculated that a prehypertensive person, ie, one with SBP 120-139 mm Hg and/or DBP 80-89 mm Hg, is 3.5 times more likely to have an MI and 1.7 times more likely to have CAD than a person with normal blood pressure. Separate analyses showed that the risk of CAD associated with prehypertension was higher in people aged > 45 years, in men, and in people with diabetes mellitus or hypercholesterolemia. Dr. Qureshi's group proposed, on the basis of their study, that the effects of antihypertensive treatment in prehypertensive patients should be investigated in clinical trials. Their study was funded by the National Heart, Lung and Blood Institute (NHLBI).

The term "prehypertension" was introduced in JNC 7, which included the category in its blood pressure classification.[12] However, it has not been taken up outside the United States or added to international hypertension guidelines, and even the American Hypertension Society has proposed doing away with the term.[26] According to the JNC 7 classification, about 59 million people in the United States have blood pressure in the prehypertension category. Lifestyle modifications such as weight control, regular physical activity, and changes in diet are currently recommended for people with prehypertension.

References

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