

# Extra Test Boosts Cardio Assessment

BY MITCHEL L. ZOLER  
Philadelphia Bureau

CHICAGO — The Framingham Risk Score failed to identify a substantial number of people who were at risk for cardiovascular disease events on the basis of their ankle-brachial index, in a review of more than 1,700 asymptomatic people.

An ankle-brachial index (ABI) of less than 0.9, a marker of peripheral artery disease, was found in 8.9% of randomly selected, asymptomatic people who had low or moderate Framingham Risk Scores (FRSs) and were either 50-69 years old and smoked or were 70 years or older.

"We showed that the ankle-brachial index can identify people at risk of cardiovascular disease events beyond those identified by their Framingham Risk Score," Dr. Andrew D. Sumner said while presenting a poster at the annual meeting of the American College of Cardiology.

"If the ABIs had not been measured, we'd never know these people were at high risk," Dr. Sumner said in an interview.

Identifying people at high risk for cardiovascular events based on a low ABI determines their target serum cholesterol levels and other important elements of their preventive care.

He noted that although existing guidelines from the American Heart Association and American College of Cardiology recommend screening asymptomatic people by measuring their ankle-brachial index, guidelines from the U.S. Preventive Services Task Force have not endorsed ABI screening for determining a person's risk for cardiovascular events.

"The Framingham Risk Score underestimates cardiovascular risk. Adding the ABI is useful for identifying patients who would otherwise be classified as low risk," said Dr. Sumner, medical director of the heart station and cardiac pre-

vention at Lehigh Valley Hospital in Allentown, Pa.

His study used data collected on 1,720 randomly chosen asymptomatic Americans in the National Health and Nutrition Examination Survey (NHANES) in 1999-2004.

This subgroup of the NHANES survey population was restricted to people 50-69 years old who smoked and those 70 years or older regardless of their tobacco use.

Dr. Sumner and his associates calculated an FRS for each of these people, which categorized them into three risk strata: 30% were low risk, with an FRS that projected a less than 10% risk of a cardiovascular event over the next 10 years; 53% were moderate risk, with an FRS that projected a 10%-20% risk of an event over the next 10 years; and 17% were high risk, with an

FRS that projected a greater than 20% risk of having a cardiovascular event over the next 10 years.

Using blood pressure readings, the researchers also calculated an ankle-brachial index for each person.

A low ABI, less than 0.9, was found in 10% of the people in the low-FRS

group (3% of the total group evaluated in this study), 11% of those with a moderate FRS (5.9% of the total group), and in 15% of the high-FRS group (2.6% of the total group).

The prevalence of peripheral artery disease among people with low or moderate FRS was highest among women, 11.0% of whom had a low ABI.

The prevalence of a low ABI among men with a low or moderate FRS was 6.3%.

Although it is possible to obtain an ankle blood pressure using just a pressure cuff and stethoscope, the most common method today uses Doppler echo to monitor the ankle pulse when measuring ankle pressure, Dr. Sumner said.

Primary care physicians who don't have an echo device in their office can refer patients for an ABI assessment, he noted. ■

**'Adding the ABI [to the Framingham Risk Score] is useful for identifying patients who would otherwise be classified as low risk.'**

## Warfarin Gene Tests Described

The American Medical Association has issued the brochure "Personalized Health Care Report 2008: Warfarin and Genetic Testing," which outlines the gene variations that affect warfarin metabolism and response, and describes

the genetic tests available to determine whether a patient carries such gene variations.

Request copies by e-mailing [pharmacogenomics@ama-assn.org](mailto:pharmacogenomics@ama-assn.org) or go to [www.ama-assn.org/go/warfarindosing](http://www.ama-assn.org/go/warfarindosing). ■

## THE EFFECTIVE PHYSICIAN

### Resistant Hypertension

BY WILLIAM E. GOLDEN, M.D., AND ROBERT H. HOPKINS, M.D.

#### Background

Resistant hypertension is defined as blood pressure that remains above goal despite the simultaneous use of three antihypertensives from different medication classes. The American Heart Association recently released a guideline to aid physicians in the care of patients with resistant hypertension.

#### Conclusions

Uncontrolled hypertension and resistant hypertension are not synonymous terms, as lack of control can be caused by nonadherence, inadequate treatment regimens, or true resistance to medication treatment. Lack of adherence to medication is a major contributor to poor blood pressure control.

Blood pressure control is achieved at less than 130/80 mm Hg in patients with diabetes or chronic kidney disease and under 140/90 mm Hg in most other patients.

Although the exact prevalence of resistant hypertension is unknown, the National Health and Nutrition Examination Survey reported that only 53% of participants treated for hypertension had blood pressures under 140/90 mm Hg. At the conclusion of the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), in which more than 33,000 patients were followed for approximately 5 years, 49% of the participants had BP controlled on one or two medications and 27% were on three or more medications.

The strongest predictor of lack of blood pressure control in the Framingham study was age over 75 years, followed by the presence of left ventricular hypertrophy and obesity.

Common pharmacologic causes of treatment resistance include nonnarcotic analgesics, sympathomimetic agents, stimulants, alcohol, oral contraceptives, cyclosporine, erythropoietin, licorice, and herbals (*Ephedra* and *ma huang*).

More than 20% of patients undergoing cardiac catheterization have renal artery stenosis of 70% or more of the vessel diameter, but it is unknown what role these lesions play in causing hypertension. Randomized trials have not shown benefit in blood pressure control or kidney function with surgical or endovascular repair of stenotic lesions.

#### Implementation

Accurate blood pressure measurement requires letting the patient sit quietly for 5 minutes prior to measurement and using an appropriate-size cuff. Paired measurements (for average) and assessment in both upper extremities should be done at the initial evaluation.

Resistant hypertension is almost always multifactorial. The medical history for patients with resistant hypertension should include the duration, severity, and progression of hypertension; treatment adherence; experience with and response to prior antihypertensives; current medications and supplements; and symptoms of possible secondary causes of hypertension.

The physical examination should include funduscopic examination for retinopathy, cardiopulmonary examination including evaluation for bruits and diminished lower-extremity pulses, and skin examination for signs of Cushing's disease.

In patients in whom "white coat" hypertension is suspected, and in those with symptoms

of overtreatment out of proportion with measured blood pressure values, a 24-hour ambulatory blood pressure recording might be valuable. A mean ambulatory blood pressure above 135/85 mm Hg is considered elevated.

Laboratory evaluation should include levels of electrolytes, blood urea nitrogen, creatinine, morning plasma aldosterone, and plasma renin. In many patients, a 24-hour urine test to measure sodium excretion, creatinine clearance, and aldosterone can be useful.

Imaging to detect renal artery stenosis should be performed only in patients in whom there is clinical suspicion.

Lifestyle modification including weight loss, dietary sodium restriction, moderation of alcohol intake, aerobic exercise (30 minutes most days/week), and a low-fat, high-fiber diet are recommended for all patients with resistant hypertension. Continuous positive airway pressure should be recommended for hypertensive patients with obstructive sleep apnea.

Medications contributing to resistant hypertension should be withdrawn.

Most referred patients with resistant hypertension have inappropriate volume overload. A thiazide diuretic should be part of the initial regimen in most patients with resistant hypertension. Chlorthalidone was shown to be more effective than hydrochlorothiazide in a blinded comparison. Loop diuretics might be needed in patients with creatinine clearance under 30 mL/min for volume and blood pressure control.

Mineralocorticoid receptor antagonists (amiloride and spironolactone) have been shown to reduce blood pressure when added to mult drug regimens. Although hyperkalemia is uncommon, potassium should be monitored. The greatest risk of hyperkalemia is in patients who are older; who are on ACE inhibitors, angiotensin II receptor blockers, and NSAIDs; and who have diabetes or chronic kidney disease.

Beyond studies of two-drug combinations, there are few data to support specific combinations of antihypertensives in patients with resistant hypertension.

#### Reference

Calhoun DA, et al. Resistant hypertension: Diagnosis, evaluation, and treatment. A scientific statement from the American Heart Association Professional Education Committee of the Council for High Blood Pressure Research. 2008 April 7 (doi:10.1161/hypertensionaha.108.189141).



DR. GOLDEN (left) is professor of medicine and public health and DR. HOPKINS is program director for the internal medicine/pediatrics combined residency program at the University of Arkansas, Little Rock. Write to Dr. Golden and Dr. Hopkins at our editorial offices or [imnews@elsevier.com](mailto:imnews@elsevier.com).