population. The subsequent 2-year incidence of overt coronary artery disease was 2.3% in men under the age of 65 years without aortic calcification and 4.1% for men under the age of 65 with aortic calcification. After adjustment for other risk factors, this difference was not statistically significant despite the large number of patients studied. Thus, the statement by Agatston and Janowitz that the presence of substantial calcification "puts that person in a higher risk category and justifies more aggressive risk factor intervention" is an attractive hypothesis that is as yet unproven. This hypothesis should be the subject of "carefully designed clinical and epidemiologic investigation," as recommended in the AHA statement.

Agatston and Janowitz appear to imply that a full range of viewpoints was not heard before the AHA issued its statement on ultrafast computed tomography. The opinion of investigators involved in the application of this modality was sought during the development of this statement. The statement was subsequently reviewed by the Executive Committee of both the Council on Clinical Cardiology and the Council on Cardiovascular Radiology as well as by the Scientific Advisory Committee of the American Heart Association. There was overwhelming support for this statement at all levels of the review process. The arguments presented by Agatston and Janowitz do not meaningfully dispute the validity of the AHA statement.

Raymond J. Gibbons, MD
Past Chairman, Committee on Advanced Cardiac Imaging and Technology
Council on Clinical Cardiology

Jamshid Maddahi, MD
Chairman, Committee on Advanced Cardiac Imaging and Technology
Council on Clinical Cardiology

Lewis Wexler, MD
Past Chairman, Committee on New Imaging Modalities
Council on Cardiovascular Radiology

Richard White, MD
Chairman, Committee on New Imaging Modalities
Council on Cardiovascular Radiology

Assessment of Peripheral Vascular Disease in Diabetics

The recommendations of the International Workshop on the Assessment of Peripheral Vascular Disease in Diabetics are welcome. While agreeing that the ankle-arm index should be incorporated into routine assessment of diabetic patients, the measurement protocol in our opinion is based on unnecessary academic finesse, resulting in an inappropriately long and complicated routine for a busy physician's practice.

First, the authors state that arm pressures must be taken with the Doppler device, but use of pressures measured routinely by auscultation would result in a level only 2 mm Hg lower than the Doppler measurement and would cause little difference in the ankle-arm index. Second, the arm pressures are to be repeated so that one measurement is taken close in time to every ankle pressure. We found (unpublished observations) that repeated measurements of systolic pressure tend to drift downward by only 2 mm Hg over a 5-minute period. This discrepancy will have little effect on the ankle-arm index, particularly as variability due to other causes, such as observer bias, is, greater. If the protocol were simpler, there would be even less need for repeat measurements. Finally, the authors recommend that duplicate measures be taken. We found, however, that duplicate measurements were very similar and that the 95% confidence interval of ±15.7% for one measurement of ankle pressure fell to only ±14.0% when the mean of duplicate measurements was taken.

Thus, we recommend that to calculate ankle-arm index in the routine clinical setting, measurements should be made of brachial pressure in both arms (by auscultation as part of routine blood pressure measurement) and right and left ankle pressures by a Doppler device over the posterior tibial and dorsalis pedis arteries. The workshop protocol includes 18 pressure measurements on a patient (assuming arm blood pressure was also measured twice by auscultation). Our recommendations comprise only six measurements. This simpler routine is more likely to become adopted into practice with minimal loss of accuracy compared with the workshop protocol.

The report from the workshop mentions the poor sensitivity of the WHO/Rose questionnaire in detecting intermittent claudication and the need for revision. After use of the WHO/Rose questionnaire on 1600 subjects in the general population and on 600 claudients, we produced and validated a modified version—the Edinburgh Claudication Questionnaire. Sensitivity increased from approximately 60% to 90%, and specificity remained almost 100%. The Edinburgh Claudication Questionnaire is shorter and simpler than the WHO/Rose questionnaire; we recommend its use in future epidemiologic studies of intermittent claudication.

Further research was also recommended on possible sex differences in the ankle-arm index because in the San Luis Valley Diabetes Study women had a lower index than men. In fact, these findings have been confirmed in two other population-based studies, the Edinburgh Artery Study and the Israeli Lipid Research Clinic Study. In the Edinburgh study, part of the sex difference disappeared on adjusting for height, possibly because pulse pressure widens down an artery so that men who are taller have a higher ankle pressure. Much of the sex difference in the "normal" ankle-arm index remains unexplained and requires further investigation.

F.G.R. Fowkes, FRCP
E. Housley, FRCP
G.C. Leng, MB, ChB
Wolfson Unit for Prevention of Peripheral Vascular Diseases
Medical School
University of Edinburgh
Edinburgh, Scotland

References


Reply

We thank Dr Fowkes and colleagues for their letter and comments and appreciate their desire for simplicity in performing