Ischemia Imaging and Plaque Imaging in Diabetes: Complementary Tools to Improve Cardiovascular Risk Management

Response to Rutter and Nesto

We read with interest the letter by Rutter and Nesto (1) in reply to our review article; however, we believe we had already addressed several, if not all, of the concerns they express. In fact, we made the following statements in our study. *1*) "Our goal was to verify whether existing data support the use of these techniques (ischemia and atherosclerosis imaging) in isolation or as complementary tools for improved risk prediction" (not necessarily management!). *2*) "Continued research will be needed to confirm that the integration of several imaging modalities improves clinical outcome in a cost effective manner." *3*) "Figure 1 is an algorithm with. . . an attempt to integrate ischemia and atherosclerosis imaging. . . based on personal opinion." *4*) "Whether all asymptomatic diabetic patients should be tested remains debatable and unlikely to be financially affordable for society. To make asymptomatic screening more affordable at least one of the following conditions should be present. . ."

The tone of our writing was more one of hope for improvement in risk assessment than a call for unnecessary expenditure. Unfortunately, the prevailing argument used by Drs. Rutter and Nesto, that atherosclerosis imaging leads to unnecessary invasive diagnostic and interventional procedures, is a bit trite and not supported by substantial literature. On the contrary, some of us have shown that the performance of calcium screening in symptomatic patients at low-intermediate pretest probability of disease reduces the rate of normal cardiac catheterizations (hence unnecessary) and increases the number of "necessary" procedures, with a net 30–35% saving compared with a traditional diagnostic pathway (2). It was far from our intention to instruct physicians on doing unnecessary procedures; it was our desire to educate the readers as to what is currently known regarding coronary artery disease imaging in diabetes. The summary is that ischemia imaging is useful in some subgroups of diabetic patients, but it fails to completely define risk in a sizable portion of individuals and for any prolonged period of time. The enormous burden of disease inherent in diabetes deserves, therefore, better risk assessment. Evidence is accumulating that atherosclerosis imaging may help this task progress. Large amounts of calcium or an increased intima-media thickness actually adds useful prognostic information in diabetes (3,4), and absence of calcium is a good marker of low risk in diabetic and nondiabetic patients alike (3). Our appeal is for a conscientious application of imaging techniques while we learn more about their risk and benefit, as we use them daily.

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Cut Points of Waist Circumference

Response to Sone and Colleagues

Sone and colleagues (1,2) adopted Japanese criteria of abdominal obesity (waist circumference ≥85 cm in men and ≥90 cm in women) for the diagnosis of metabolic syndrome. These Japanese criteria of abdominal obesity were proposed by the Examination Committee of Criteria for Obesity Disease in Japan set up by the Japan Society for the Study of Obesity (3). They proposed waist circumferences of 85 cm in men and 90 cm in women as equivalent values for visceral fat area (VFA) of 100 cm^2. However, these cut points of waist circumference resulted from the inappropriate presupposition that VFA is linearly proportional to waist circumference. They determined the values by linear regression lines without revealing the sensitivities and specificities of these cut points. In fact, the dots in their VFA–waist circumference graphs were not scattered along linear lines, though VFA and waist circumference correlated well (3). If they had determined the cut points of waist circumference by receiver operating characteristic curves as they did to determine the cut points of BMI and VFA and determined the cut points of VFA separately by sex, the cut points of waist circumference might have been equivalent to Asian criteria (≥90 cm in men and ≥80 cm in women). For example, Shiwaku et al. (4) reported that optimal cut points of waist circumference were 82 cm for men and 73 cm for women in Japan. If the Examination Committee calculated areas under receiver operating characteristic curves, waist circumference might reveal to be a poor discriminator of VFA especially in women. After all, waist circumference is a marker of abdominal (central) obesity not of visceral obesity, which is assessed by VFA using computer tomography scanning, exposing subjects to X-ray irradiation. Therefore, Sone et al. should reanalyze their data using Asian criteria of waist circumference (≥90 cm in men and ≥80 cm in women) before reaching conclusions on the prognostic significance of metabolic syndrome defined with both National Cholesterol Education Panel (1) and International Diabetes Federation (2) criteria in Asian diabetic patients.

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