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## LETTERS TO THE EDITOR

### Prognostic Utility of Coronary Computed Tomography Angiography

#### Are We Looking at the Correct Outcomes and Making Appropriate Comparisons?

In a recent issue of *JACC*, Hadamitzky et al. (1) address the prognostic value of 64-slice coronary computed tomography angiography (CCTA) for the prediction of cardiac events in 1,150 consecutive patients with suspected coronary artery disease (CAD). Clinical end points, defined as severe cardiac events (cardiac death, myocardial infarction, or unstable angina requiring hospitalization) and all cardiac events (also including revascularization >90 days after CCTA), were documented during a median follow-up of 18 months. Patients were subdivided into those with obstructive CAD ( $\geq 50\%$  diameter stenosis in any coronary artery;  $n = 348$ ) and those without obstructive CAD ( $n = 802$ ). The frequency of severe cardiac events (1.4% vs. 0.1%: odds ratio [OR]: 17.3; 95% confidence interval [CI]: 3.6 to 82.5;  $p = 0.004$ ) and of all cardiac events (4.9% vs. 0.5%: OR: 16.1; 95% CI: 7.2 to 36.0;  $p < 0.001$ ) was significantly higher in patients with obstructive CAD.

The authors conclude that “these findings add substantial evidence to establishing CCTA as a routine modality for assessing the risk for cardiac events of patients with suspected CAD.” This conclusion, however, is neither convincing nor supported by the data presented. If we simply look at hard end points, there were no cardiac deaths in any group; there was only 1 myocardial infarction in the obstructive CAD group and 0 in the nonobstructive group. The differences in cardiac events between the 2 groups were driven exclusively by a high number of revascularization procedures (mostly percutaneous coronary intervention) performed on patients with obstructive CAD (15 of 348) versus no obstructive CAD (3 of 802), and by hospitalization for unstable angina (4 of 348 vs. 1 of 802).

However, unstable angina is a “soft” end point that has a subjective interpretation. In addition, unless unstable angina leads to an increased incidence of death and myocardial infarction, it should not be a matter of concern, especially in the current era, when patients with their first episode of acute chest pain are being hospitalized (2). Coronary revascularization (even when performed “later”) is best described as a management decision (and not an “outcome”) that is severely influenced by the performance of coronary angiography (treatment bias due to the oculostenotic reflex) (3–5). The relative unimportance of revascularization as an end point is further

corroborated by the fact that, to date, no prospective randomized clinical trials have demonstrated that either surgery or angioplasty decrease the risk of myocardial infarction or death over aggressive optimal medical therapy and lifestyle interventions in patients with chronic CAD (6,7).

Another key finding of the study by Hadamitzky et al. (1) was that the rate of all cardiac events in patients without obstructive CAD was significantly lower than predicted by the Framingham risk score, whereas for patients with obstructive CAD, the observed event rate was significantly higher than predicted (Fig. 4 of Hadamitzky et al. [1]). However, again, this conclusion is based on an improper comparison. The Framingham score is a primary events model developed to estimate the risk of an initial CAD event in individuals free of CAD, not in those with suspected CAD. Moreover, the Framingham risk score was designed to specifically predict CAD events, not all cardiac events (including revascularizations) (8).

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