Non-invasive imaging in suspected coronary artery disease: Choosing the right test from the first time

Habib A. Dakik, MD, FACC, FRCP[a]

[a] Division of Cardiology, American University of Beirut Medical Center, Beirut, Lebanon

Received Sep 6, 2016; accepted Sep 6, 2016
doi:10.1007/s12350-016-0683-0

See related article, doi: 10.1007/s12350-016-0664-3.

Over the past two decades, the number of non-invasive tests available for the assessment of patients with suspected coronary artery disease has significantly increased. Although sometimes these tests are considered competitive, in real practice and when one considers the whole spectrum of patients with coronary artery disease, these tests provide complimentary data in many instances. The choice of one test vs another entails a long list of many variables some of which are availability and waiting time, diagnostic accuracy, prognostic power, local expertise, radiation exposure, ability to provide data on exercise capacity, ability of the patient to exercise, the need for the data on ischemic burden, history of myocardial infarction, prior revascularization, the need of data on ventricular/valvular function, etc. Another very important variable is the cost of each test which varies tremendously between countries and is very difficult to standardize. It is interesting to note that the cost of invasive coronary angiography in some countries is lower than that of a myocardial perfusion scan and thus a coronary angiogram might be the first test to be performed in a certain patient population that might otherwise be assessed by a non-invasive imaging test in another country. Given these factors, it is not surprising that the clinical characteristics of patients referred for these different tests are quite different.[1-3]

Reprint requests: Habib A. Dakik, MD, FACC, FRCP, Division of Cardiology, American University of Beirut Medical Center, Beirut, Lebanon; *hd01@aub.edu.lb*

J Nucl Cardiol
1071-3581/$34.00

In this issue of the journal,[4] Karthikeyan et al. try to shed some light on this important topic by studying one specific issue regarding the choice of a non-invasive test (the need for further downstream testing) in a specific group of patients (mildly symptomatic/asymptomatic patients with intermediate likelihood of having CAD/risk of cardiac events). The authors conclude that ''a strategy of initial stress MPI is substantially less likely to require further downstream testing than initial testing with CCTA.'' The study is well designed with clear objectives. However, there are several limitations that impact the interpretation of the results and their application in the routine clinical practice of physicians. Some of these are logistic and related to the fact that the study was stopped early due to problems in recruitment with only 60% of the target sample size being enrolled. Furthermore, most of the study population came from two out of the six study sites which raise issues regarding representation of the final study population analyzed. Another important limitation is the absence of clinical outcome data, which is one of the most important variables that affect physicians' choices and practices.

How would the results of this study change practice? It is difficult to predict in view of the limitations discussed above and particularly in view of the PROMISE study finding that there is no difference in long-term outcomes in patients referred to CTA vs functional testing.[5] What is the next step from here? To answer, it is important to go back to what the practicing physicians who see patients in the clinics and hospitals want. Those physicians have all these tests available for their utilization. The important question for them is not whether one test leads to more downstream testing than another or whether one test is ''better'' than another one. They realize that each test has advantages and disadvantages. The important and clinically relevant question for them is how to match each patient with his/her special clinical characteristics with each test and the special data it

Published online: 28 September 2016

provide. Thus, the important challenge for clinical research would be to develop well-defined patient groups for which physicians can be advised about the best test choice for each group based on the group clinical characteristics, the diagnostic/prognostic power of the test, and the specific data required from the test.

References

1. El Sibai K, Itani S, Rabah A, Hourani M, Dakik HA. Evaluation of the appropriateness criteria for coronary computed tomography angiography in an academic medical center in a developing country: Comparison of the 2006 and 2010 criteria. J Nucl Cardiol 2011;18:1053-8.
2. Shreibati JB, Maker LC, Hlatky MA. Association of coronary CT angiography or stress testing with subsequent utilization and spending among Medicare beneficiaries. JAMA 2011;306:2128-36.
3. Hannoush H, Shaar K, Alam S, Nasrallah A, Sawaya J, Dakik HA. Analysis of referral patterns, predictive accuracy, and impact of myocardial perfusion imaging on patient management in a new nuclear cardiology laboratory. J Nucl Cardiol 2003;10:148-53.
4. Karthikeyan G, Guzic-Salobir B, Jug B, Devasenapathy N, Alexanderson E, Vitola J, et al. Functional compared to anatomical imaging in the initial evaluation of patients with suspected coronary artery disease: An international, multi-center, randomized controlled trial (IAEA-SPECT / CTA study). J Nucl Cardiol, in press.
5. Douglas PS, Hoffman U, Patel MR, Mark DB, Al-Khalidi HR, Cavanaugh B, et al. Outcomes of anatomical versus functional testing for coronary artery disease. N Engl J Med 2015;372:1291-300.