Mortality Is Not an Adequate Surrogate for Percutaneous Coronary Intervention Quality

Spencer B. King III, MD, MACC, Editor-in-Chief, JACC: Cardiovascular Interventions

There is great interest in how quality of medical procedures is assessed and reported. Terms such as “risk adjusted mortality,” “public reporting,” and “risk averse behavior” are showing up in conversations among interventional cardiologists, especially across the United States. The Interventional Council of the American College of Cardiology has been discussing these issues, and several publications are to appear in this journal debating them. Everyone agrees that improving quality is a worthy goal that should be pursued. Defining quality has been a more difficult charge. Like pornography, many do not seem able to define it but think they know it when they see it. One of the most critical things about measuring outcomes, however, is to have a measurable outcome. Death is pretty clear cut, so it rises to the top of easily measured outcomes. Much of the upcoming discussion in JACC: Cardiovascular Interventions will focus on risk adjustment of mortality rates, consideration of exclusion from reporting, or separate reporting of very high-risk patients in order to mitigate risk-averse behavior and the value or lack of value of public reporting of mortality rates, as well as other outcomes. There will be more than 1 perspective on all these issues, and I will make no attempt to extensively discuss them in this brief note.

However, this morning during the scheduled Mortality and Morbidity conference at Emory, all the deaths following percutaneous coronary intervention (PCI) were presented. I think we are aware that mortality after PCI is concentrated in the high-risk groups, but the cases presented this morning were very illuminating. According to the NCDR (National Cardiovascular Data Registry), the mortality risk for the patients who died ranged from 50% to 75%. Patients with cardiogenic shock, ejection fractions below 20%, end-stage renal disease, acute surgical graft thrombosis, and subacute stent thrombosis were among those presented in detail. All had PCI performed along with balloon pumping or Impella use in an effort to salvage the situations. All but 1 PCI was technically successful, that is the arteries were opened and flow was improved. Despite these efforts, the patients died. A review of each case failed to identify PCI maneuvers that contributed to the deaths. It appeared that withholding interventional therapy would also have not contributed to survival, but that is of course undeterminable. The other striking thing about these cases is that all of them were referred from other hospitals with PCI and surgery capabilities to Emory to address their desperate situations. How does the knowledge of these deaths contribute to quality improvement? Does risk adjustment level the field between the tertiary center and the hospitals that do not treat these patients? Should these high-risk patients, almost all of whom were in shock, be reported as part of the institutional and operator outcomes? It is being suggested by some that patients at very high risk should be excluded from reporting. We, in the New York State registry, did exclude refractory shock and out-of-hospital cardiac arrest with anoxic encephalopathy several years ago because of the concern that care might be withheld by some operators (risk-averse behavior). Others point out that if the high-risk patients are excluded from reporting, that there will be so few events in the low-risk group that the outcome of mortality will be so low as to be meaningless as an outcome measure. I wondered this morning what the distribution of mortality risk scores was for all the PCI patients. Because the patients who died had scores of 50% to 75%, what will the scores be for all the patients who did not die? Perhaps there is an
opportunity to examine such data and learn something helpful. More helpful would be learning which patients are not undergoing PCI. What is the outcome of high-risk patients not selected for PCI compared with the outcome for those having it? The same question can be asked for low-risk patients. An effort to look at all ST-segment elevation myocardial infarction–identified patients, whether having PCI or not, is being investigated by the New York Department of Health. With this information, we may be able to better understand the access to care. Who is not receiving PCI and what are their outcomes?

We need to understand what quality is, and gross mortality rates will not do it. If I am to have a PCI because I am in cardiogenic shock and have extensive coronary artery disease and severely impaired left ventricular function, as well as other comorbidities, I want to know the track record for treating such patients in the hospital to which I am admitted. If the hospital has an adjusted mortality rate that is excellent but treats no patients like me, then I am in trouble. On the other hand, if I have stable angina or a ST-segment elevation myocardial infarction without high-risk features, then I am more concerned with quality measures other than mortality, such as angina relief, reintervention, and optimal medical therapy long term.

As several papers in upcoming issues of JACC: Cardiovascular Interventions weigh in on risk adjustment and public reporting, we should consider focusing on what quality is, how to measure it, and how to improve it. I believe quality cannot be assessed by mortality post-PCI when it is not due to the PCI, but is despite the PCI.

ADDRESS CORRESPONDENCE TO: Dr. Spencer B. King III, Saint Joseph’s Heart and Vascular Institute, 5665 Peachtree Dunwoody Road NE, Atlanta, Georgia 30342. E-mail: spencer.king@emoryhealthcare.org.