Within the next 20 years, nearly one quarter of the population will be aged ≥65 years. Cardiovascular morbidity and mortality rise rapidly after age 65, and this group accounts for 60% of myocardial infarction-related deaths. The high burden of comorbid conditions and concomitant lower physiological reserve render this group more complex and fundamentally different from its younger counterparts.

Geriatric Assessment to Improve Risk Stratification in Older Patients Undergoing Coronary Revascularization

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The concept of frailty has gained general acceptance in geriatric medicine as an important prognostic indicator for a range of adverse outcomes. According to current views, frailty can be defined as a physiological state of increased vulnerability to stressors that results from decreased physiological reserves. This reduction in reserve capacity results in difficulty maintaining homeostasis in the face of perturbations, including injury, acute illness, and invasive procedures. Although a consensus definition and corresponding assessment tool do not exist yet, a widely used operational phenotype for frailty includes 5 criteria: exhaustion, weight loss, low physical activity, weak hand grip, and slow gait speed. There is emerging interest in understanding the role of frailty as it pertains to acute coronary care in elderly persons. A previous systematic review found that the prevalence of frailty as it pertains to acute coronary care in elderly persons was 49% among patients with severe coronary artery disease or heart failure and that frailty was independently associated with all-cause mortality, with odds ratios ranging from 1.6 to 4.0.

Despite their strong associations with clinically meaningful outcomes, geriatric conditions, such as frailty, are not typically included in cardiovascular risk models. These models can be helpful for medical decision-making in patients facing percutaneous revascularization because patients judged to be at higher risk may receive additional or alternate treatments and more vigilant surveillance, whereas patients estimated to be at lower risk may be reassured and managed according to routine protocols. Underestimating the importance of robust risk models in older patients with coronary artery disease is the finding that physicians often underestimate risk when using implicit, subjective assessments.

In this issue of *Circulation: Cardiovascular Quality and Outcomes*, Singh et al report the prognostic utility of frailty (using the phenotypic definition), comorbidity (as operationalized by the Charlson Comorbidity Index), and quality of life (assessed with the Medical Outcomes Study 36-item short-form survey) in predicting adverse long-term outcomes after percutaneous coronary revascularization. Specifically, the authors describe the incremental prognostic value of frailty, comorbidity, and quality of life over a traditional risk model, the Mayo Clinic Risk Score. This study extends knowledge from previous studies that evaluated the independent association of frailty with adverse outcomes but not its incremental prognostic value over standard cardiovascular risk models. In the Singh et al, only frailty improved the predictive accuracy for the combined outcome of 3-year mortality or myocardial infarction, as evidenced by an improvement in the net reclassification index and substantial increase in the C statistic. In contrast, comorbidity and quality of life provided greater prognostic improvements for 3-year mortality compared with frailty. The effect of comorbidity on mortality is not surprising because the Charlson Comorbidity Index was developed to predict this outcome.

Because frailty, quality of life, and comorbidity were assessed after cardiac catheterization, it is not known whether these measures reflect preprocedural health status or the consequences or complications of having recently undergone an invasive procedure. This “chicken or egg” distinction is important because risk factors present before revascularization can be used to inform conversations with patients considering the procedure. Risk factors that develop after revascularization obviously cannot be used for patient selection but could signal the need for closer surveillance and supportive treatments. Additionally, development of postprocedure frailty is a relevant outcome in its own right for this population. Previous work has demonstrated that among older patients considering treatment options, risk of developing functional impairments (eg, frailty) strongly influence preferences to pursue treatment.

The important message from the Singh et al study for interventional cardiologists and other clinicians is that nontraditional risk factors, such as frailty, are highly prevalent and carry important prognostic information among older persons undergoing coronary revascularization. Future studies should assess whether preprocedure frailty assessments can be used to refine selection of appropriate candidates for revascularization and improve mortality and reinfarction outcomes. Given the importance of functional outcomes for
older patients, the risk of developing frailty after revascularization also should be clarified.

Incorporating assessment of frailty and particularly quality of life into routine clinical practice poses significant challenges to our healthcare system. Frailty and quality of life fall outside the traditional disease-oriented model of medicine and, thus, may be overlooked in clinical settings. Currently, there is no financial reimbursement or other incentives for performing such assessments. Decreasing lengths of stay, with growing pressure to complete evaluation and treatment plans expeditiously, present additional obstacles to routine assessment of such nondisease measures.

In the face of these disincentives, identifying the most efficient assessments that provide clinicians and patients with useful prognostic information is critical. Assessing all frailty components may not provide much more prognostic information than assessing gait speed alone. Slow gait speed is a strong and consistent predictor of mortality in older persons, and the single best predictor of functional decline. In light of its strong predictive abilities and objective assessment, there is growing consensus among geriatricians and gerontologists that gait speed should be considered a “geriatric vital sign.” The assessment of gait speed at usual pace over 4 m is an efficient, safe, and highly reliable measure with the ability to identify older adults at risk for a range of poor clinical outcomes.

To accurately inform medical decision-making, risk models must be useful for populations representative of those cared for in clinical practice, including patients with multiple chronic conditions, poor quality of life, and frailty. Traditional cardiovascular risk models were developed using data derived from younger populations and elderly patients who were rigorously screened to exclude common morbidities of old age. To meet the needs of the aging population, a new clinical paradigm is needed, one that starts with a comprehensive assessment of risk for adverse clinical and patient-centered outcomes and then tailors therapy and surveillance to each patient’s risk. Transitioning to this new paradigm is essential to ensuring that optimal care is provided to older patients with cardiovascular disease.

Disclosures
None.

References

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