Cardiovascular Care in an Increasingly Diverse Community
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Cardiovascular care in an increasingly diverse community represents a distinct challenge for cardiovascular medicine, the following cases illustrate these challenges.

Case Presentation: A 66-year-old black woman arrives at her local emergency department in the southern United States. She works as a full-time secretary and has a history of poorly controlled hypertension despite several attempts at combination drug treatment therapies. She presents with chest pain and shortness of breath. Her anti-hypertensive regimen is adjusted, and she is given a follow-up appointment to see her usual physician. She returns in 2 weeks with new-onset heart failure (HF) status post old acute myocardial infarction.

Case Presentation: A 72-year-old Hispanic woman visits her primary care physician. She has previously been diagnosed with diabetes mellitus, hypertension, and kidney disease. She speaks only Spanish, but the translator is not available owing to illness. The patient tells her physician that she has been experiencing shortness of breath. The patient is given a diuretic and a return appointment. She is admitted 3 days later with decompensated HF.

Case Presentation: A 52-year-old stoic Southeast Asian man, a practicing physician, reports to a colleague the sudden onset of chest pain. He has had no previous diagnoses and exhibited no risk factors before the event. He is reassured and a routine exercise treadmill test is ordered. Within 24 hours, he experiences sudden cardiac death.

A Changing Community
A growing body of literature is forming a vision of a rapidly approaching different future for cardiology. The US Census Bureau predicts that by 2050, non-Hispanic whites will no longer be the majority as the numbers of Hispanics, Asians, and people of multiple races increase (Figure 1).1,2 With these predicted shifts in population demographics, well-known racial and ethnic health disparities will become increasingly prevalent. Because cardiovascular disease (CVD) remains the predominant cause of morbidity and mortality, understanding how to improve cardiovascular care for the changing population is critical. Central to this emerging awareness will be the elimination of racial and ethnic health disparities. As each of the foregoing hypothetical clinical vignettes highlights, appropriate care in a diverse community must be free of bias and stereotypes, language appropriate, and culturally competent. Until now, all of these have not been commonly represented in cardiovascular care. A new approach is necessary.

Although most cardiologists acknowledge the strong evidence demonstrating the existence of racial/ethnic disparities, we are unlikely to recognize them in our own hospital settings or within our own practices.3 Physicians are more likely to attribute the root cause of disparate care to patient-level or system-level deficiencies than to problems at the provider level.

It is important to distinguish between healthcare differences and disparities. The definition adopted by the Institute of Medicine identifies healthcare disparities as “racial or ethnic differences in healthcare that are not due to access-related factors, clinical needs, patient preferences, or the appropriateness of the intervention.”3a Thus, a greater prevalence of hypertension in blacks or of diabetes mellitus in Hispanics represents a difference, whereas a lower rate of treatment to goal may represent disparate care (Figure 2).2
CVD in Minorities

Minorities have a greater burden than others of myocardial infarction, HF, stroke, and other cardiovascular events; these disparities translate to disproportionate cardiovascular morbidity, mortality, and quality of life. Black men have the highest overall CVD death rate, and the CVD death rate in black women is considerably higher than that in white women. Importantly, CVD deaths occur much earlier in blacks compared with whites. CVD mortality also increased significantly in middle-aged Native Americans from 1995 to 2005, a problem that was exacerbated by racial misclassification.

Risk Factor Assessment and Presentation

The burden of diabetes mellitus is borne disproportionately by blacks, Mexican Americans, Hispanics, and other ethnic minorities. The majority of CVD cases in American Indians occur in individuals with diabetes mellitus. Notably, Hispanics present with higher risk profiles for CVD but have lower rates of coronary heart disease (CHD) and CVD mortality than whites regardless of their diabetic status. A difference in risk factors and prevalence of either CVD or subclinical disease has also been seen in Mexican Americans, although their risk profiles were distinct compared with individuals of other Hispanic backgrounds, demonstrating the importance of delineating Hispanic subgroups. Further study is required to better understand this paradox of risk and disease and to appreciate the intragroup differences seen among Hispanics.

Traditional CVD risk factors in Asian Americans have some similarities to those of whites, but data on Asian subgroups are scarce, and many health differences remain unknown. The prevalence of CVD risk factors appears to vary greatly across Asian subgroups, which could affect risk assessment. Interestingly, South Asians can exhibit more nontraditional CVD risk factors, including insulin resistance and differences in inflammatory markers. CVD risk factors remain poorly defined in other racial/ethnic minority populations, particularly American Indians and Alaska Natives. No differences among racial/ethnic minority populations were consistently found for obesity or hypercholesterolemia. Some biomarkers that may vary among racial and ethnic

Figure 1. Analyses of US Census data predict that non-Hispanic, single-race white will become a minority population by 2050.

Figure 2. Health differences among diverse populations reflect multiple factors, whereas healthcare disparities refer to differences that are not due to access-related factors.
groups are currently being investigated, but further study is required.

Systematically assessing and quantifying modifiable CVD risk factors in minority populations is critical. As noted by Kurian and Cardarelli, “Better understanding and awareness of the disparities of CVD risk factors by race and ethnicity may help clinicians and public health professionals develop culturally sensitive interventions, prevention programs, and services specifically targeted toward risk burdens in each of these populations.”

**Hypertension**

One significant risk factor for CVD is hypertension, which affects an estimated 76.4 million US adults.6 Black adults’ hypertension rate is among the highest in the world; in 2006, blacks’ death rates from hypertension were 3 times higher than those of other racial and ethnic groups.2,4,5 Patients’ awareness of their condition and of whether medications control it continues to challenge care providers. Blacks and Mexican Americans tend to have poorer blood pressure control than whites, even after consideration of modifiable health behaviors, suggesting that other racial/ethnic differences underlie these disparities.12 Identification of specific risk factors for minority populations may help improve hypertension outcomes.

Studies to discern unique characteristics of hypertension in blacks have found, for instance, that aldosterone correlates significantly with several CVD risk factors associated with obesity-related hypertension in this population.13 Beyond being a known marker for CVD morbidity and mortality in the absence of other risk factors, N-terminal prohormone brain-type natriuretic peptide appears to be an independent biomarker for predicting CVD events, including HF and death, in blacks with kidney disease and hypertension.14

**CHD and Coronary Artery Disease in Minorities**

Ethnic minority patients with CHD are generally younger, have more comorbidities (eg, diabetes mellitus, hypertension, high body mass index), and are more likely to be female.15 Minorities with acute coronary syndromes are at greater risk of death, myocardial infarction, or rehospitalization for acute coronary syndromes and are less likely to undergo angiography or percutaneous coronary intervention than white patients.15,16

Risk-factor clustering is apparent in minority populations with CHD.17 The pathological process associated with risk-factor clustering contributes to higher CHD burden among black men and women.9 Unfortunately, despite having a higher CHD risk, black men and women are less likely to receive adequate treatment or control of risk factors, including dyslipidemia and hypertension.17

In a study of elderly black women with CHD, nearly all participants reported unusual fatigue and sleep disturbance as prodromal symptoms; fewer than half reported prodromal chest pain or discomfort.18 The most acute symptom was shortness of breath, with minority women reporting significantly more acute symptoms than white women. Hispanic and Alaska Native women exhibited the least CVD risk, whereas blacks exhibited the most.19 Some racial/ethnic disparities were explained by differences in individual and community characteristics, but other disparities persisted even after controlling for these factors.19 Other racial/ethnic differences have been noted in the presentation of CHD. For example, Hispanics undergoing coronary artery bypass graft surgery generally present with more comorbidities and are younger, are more likely to be female, and have lower body mass index than others undergoing the surgery.20

South Asians have an elevated risk of morbidity and mortality resulting from ischemic heart disease and have not benefited to the same extent from the general decline in deaths caused by ischemic heart disease over the last few decades.21 Chinese, South Asian, and Southeast Asian patients are likely to exhibit classic symptoms of acute myocardial infarction.22 More than 30% of patients in this group wait >12 hours to seek treatment, whereas whites are more likely to seek medical attention and to undergo angiography within 3 hours of onset of symptoms.22

Black and Hispanic patients have longer delays to reperfusion than whites (Figure 3).2 Disparities in coronary artery disease treatment were shown to be at least partially mediated by the ways in which patient race or ethnicity influenced physicians’ perceptions of patients’ social and behavioral characteristics.21 Awareness of these perceptions and of differences in incidence, risk factor burdens, prognosis, and treatment is necessary to mitigate racial and ethnic disparities.

**Heart Failure**

Mechanisms of HF vary by ethnicity. Blacks are at a significantly higher risk for incident HF than other ethnic groups.24 In HF patients, increased risk correlates with the presence of hypertension or diabetes mellitus, which, in combination with environmental factors, largely explains HF differences. Differential use of coronary revascularization may contribute to the poorer functional outcomes observed among black patients with documented coronary disease.24

The African-American Heart Failure Trial is of landmark significance in this area because it suggested that differences in pharmacobiology may require tailored drug treatment strategies for people of different racial/ethnic backgrounds. Isosorbide dinitrate/hydralazine, when added to a conventional neurohormonal blocking agent, reduced mortality and morbidity considerably for blacks with HF and became the first cardiovascular drug approved specifically for use in a racial cohort.25 Although this discovery was considered a breakthrough, the adoption of this approach has been limited in part by the challenges of specifically addressing a patient’s race in clinical practice. More easily delineated phenotypic, genotypic, or culturally spe-
specific markers are needed to replace the biologically ambiguous idea of race in clinical decision making.

**Stroke**
Blacks have a higher incidence of stroke than any other racial group in the United States, and their strokes tend to be more severe and to cause higher mortality. Similar to CHD, blacks tend to be younger at the time of the first stroke event. When stroke incidence appeared to go down in 2010, the change was the result of a decrease in ischemic stroke in whites only; the incidence in blacks remained unchanged.

CVD risk factor burden has been implicated in stroke incidence, particularly the presence of hypertension or diabetes mellitus and particularly for blacks. African Americans had a higher prevalence than other groups of 5 risk factors independently associated with stroke: hypertension, treated diabetes mellitus, claudication, high C-reactive protein, and inactivity.

**The Path Forward**

**Prevention**
Although racial and ethnic disparities clearly exist within the CVD population, we are more alike than we are different, and some consistencies are incontroversial. Obesity and overweight have a negative impact on all ages, all race/ethnic groups, and both sexes. Caloric management through proper nutrition and physical activity is universally important. Body mass index and waist circumference are inversely associated with fitness; low fitness is most significant in non-Hispanic blacks and Mexican Americans. High rates of obesity are reported among Mexican American men and women and among white women with lower levels of education.

An increase in CVD risk factors may be due in part to the adoption of diet and lifestyle changes that negatively affect cardiovascular health in minorities. For example, an increase in CVD risk factors, specifically hypertension, between first- and second-generation Mexican Americans suggests that diet and lifestyle changes are negatively affecting CVD health in this population and likely others. The generational changes shown here illustrate the potentially negative impact of the adoption of unhealthy lifestyles in some immigrant populations.

Lifestyle interventions should be universally applied, but it must be noted that risk assessment is a unique challenge in certain populations. For example, current guidelines used to identify the metabolic syndrome underestimate the risk in South Asian individuals. Culturally sensitive prevention programs that incorporate such nuances such as a novel hypertension screening program in barbershops frequented by blacks will help mitigate disparities.

**Quality**
The benefit of a quality-focused approach cannot be overlooked as a path-way toward reducing and possibly eliminating healthcare disparities. Recent data have already demonstrated that such an approach not only narrows and ultimately eliminates evident gaps in care at baseline for hospitalized patients with coronary artery disease but also improves care for all cohorts. These findings are worth promulgating because a similar approach for HF and stroke care is likely to be similarly beneficial. The Robert Wood Johnson Expecting Success program has demonstrated improvement in quality measures for HF by focusing quality improvement initiatives in at-risk community hospitals. The challenges of a quality-focused approach in the outpatient setting are considerable.

**Research**
A more inclusive and innovative approach to clinical research will be required as we move forward. The burgeoning populations of Hispanics and Asians should be incorporated into future trials to help us better understand their unique CVD presentation and optimal interventions. Community-based efforts, proven to be beneficial, must be implemented because the economic and human toll of unrecognized disease is no longer acceptable. Behavioral research that informs best practices in the practitioner-patient interface must be pursued. We need new data to fully address our increasingly diverse future. Patient-centered outcomes research offers new opportunities to understand the impact of clinical interventions on minority communities in real-world settings.

**Cultural Competency**
We must acknowledge that race especially is a nonphysiological assignment and reflects more on cultural experience and the aggregation of the social determinants of health than on a specific biology. Although it is reasonable to continue to seek out genetic differences that are overrepresented in certain groups, culture will always trump genetics. We practitioners of cardiology have the opportunity to lead the charge in reducing racial,
ethnic, and sex-based disparities and must do so by embracing a greater cultural awareness of the patients we serve. This includes understanding nuances in presentation, risk factors, and decision making in different racial and ethnic groups. Cultural competency, which has been defined as the ability “to provide care to patients with diverse values, beliefs, and behaviors, including tailoring delivery of care to meet patients’ social, cultural, and linguistic needs,” is a new skill that will require the same awareness as clinical practice guidelines if we are to achieve the best care for all who are at risk for or who have CVD. In addition, the importance of respecting language and literacy differences cannot be overstated.

Case Resolution
Consider the 3 case participants. The first patient is at high risk of CHD given her age, symptoms, and uncontrolled hypertension. Higher rates of CHD are apparent in elderly black women, and women with CHD often present with shortness of breath. Controlling her hypertension is critical to avoid stroke and should be a priority for this patient. In the case of patient 2, recall that risk-factor clustering is apparent in minority populations with CHD and that women often present with shortness of breath in CHD. The multiple risk factors make a thorough analysis for CVD imperative, and the ethnic subgroup of this patient may prove important. It should be noted that despite the number of risk factors present, the outcome for this patient may be better than for some because of her ethnicity. Still, follow-up remains important, and effective communication is paramount. Case 3 illustrates that we should be certain to consider nontraditional risk factors in addition to more traditional risk factors. South- east Asians are less likely to exhibit the classic presentation of acute myocardial infarction and have elevated risks of morbid and mortal events resulting from ischemic heart disease; thorough examination is required.

Conclusions
Delivering the best cardiovascular care in an increasingly diverse community will require a universal focus on prevention; an unyielding embrace of an evidence-based, quality-focused approach; novel research initiatives; and specific treatment sensitivities tailored to the cultural context of our patients. We cannot allow gross health inequities to continue on our watch. It is time to start integrating treatments tailored to race and ethnicity into standards of practice. Decreasing racial and ethnic disparities must become a priority at the patient, provider, and systems levels. Although additional research is needed, increased awareness on the part of practicing physicians is an essential and immediate next step. Better understanding and awareness of the disparities in CVD risk factors may help clinicians and public health professionals develop culturally sensitive interventions, prevention programs, and services specifically targeted toward risk burden and disease reduction in each racial and ethnic population. The time has come to no longer simply recognize our increasing diversity and evident healthcare disparities, but to embrace our diversity and achieve true health equity.

Disclosures
None.

References


