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EDITORIAL COMMENT

Racial Differences in Long-Term Cardiovascular Outcomes

The Need to Move From Description to Action*

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It has been more than 3 decades since reports of racial differences in cardiovascular disease (CVD) treatment and outcomes first emerged (1,2). These disturbing findings garnered much attention and prompted significant research interest. In the years that followed, several things have become clear. Relative to whites, blacks have a higher burden of CVD risk factors, including hypertension, diabetes, and obesity (3). These factors contribute to earlier onset CVD among blacks, lower rates of coronary revascularization, and most alarmingly, significantly higher CVD mortality rates than whites (4-6).

In this issue of *JACC: Cardiovascular Interventions*, Golomb et al. (7) use a different lens to examine whether CVD outcomes still differ by race. Studying 10 randomized controlled trials (RCTs) of coronary stents, the researchers investigated whether blacks undergoing percutaneous coronary intervention (PCI) had worse outcomes than whites. They found that, relative to whites, blacks receiving PCI had significantly higher risk for major averse cardiovascular events at 30 days, 1 year, and 5 years. Even after adjusting for multiple clinical factors, blacks persistently had approximately 30% higher major adverse cardiovascular events at all time points examined and reaching statistical significance at 1 and 5 years.

The unique study design utilized by the investigators addresses some limitations of prior cohort studies. Specifically, the RCT populations had high-quality clinical data, core lab angiographic readings, and formal adjudication of outcomes. The use of RCT data also increases the homogeneity of study population and treatment received across racial groups. All were selected and agreed to participate in a trial, all underwent PCI, and the type of coronary stent used was adjusted for. Additionally, the investigators looked at multiple short- and long-term CVD outcomes.

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Although the study was well conducted, the selected trial population also creates some challenges. Those enrolled in RCTs are typically healthier, receive better care, and as a result, have better outcomes than those in the community. The trials also enrolled a low proportion of black patients, which increases the risk of selection bias. Additionally, the trials classified those of Hispanic ethnicity as a separate race category, which is not consistent with current standards. Yet, despite these strengths and weaknesses, the bottom-line conclusions from the Golomb et al. (7) analyses are strikingly similar to those from multiple studies conducted over the past several decades. Relative to whites, blacks with CVD have significantly worse longitudinal outcomes.

If clinical factors and access to coronary revascularization cannot explain worse outcomes among blacks, what does? Some have investigated whether genetic differences between blacks and whites might provide a clue (8). However, significant genetic

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heterogeneity exists within all racial groups, making simple characterization of genetic backgrounds by racial class problematic (9). Additionally, the researchers in this study examined those who already had pre-existing CVD, and adjusted for the presence of CVD risk factors. Thus, even in the presence of underlying genotypic differences between blacks and whites, much of their effect should have been accounted for when the researchers adjusted for these clinical phenotypes.

Beyond genetics, it is clear that race is also a surrogate for other socioeconomic factors that influence both medical care and patient outcomes. Unfortunately, in this country, blacks still tend to have lower income, education, and employment than whites. Although not captured in the current study, these social and financial factors have all been previously linked to CVD outcomes (10). These factors also influence other characteristics, including insurance status, health literacy, and patient beliefs, which in turn, can affect health care access and patient outcomes. Nevertheless, racial disparities in cardiovascular health care and outcomes typically persist even after accounting for socioeconomic status (11,12).

The combined influence of these drivers is substantial. Blacks in this country are less likely to be treated by cardiovascular subspecialists and more likely to be treated at low-volume and low-performing centers (13). Blacks are also less likely than whites to receive evidence-based CVD prevention therapies, including blood pressure control (14) and use of lipid-lowering therapies (15). Lower prescription rates as well as lower persistence account for these differences (16). Again, the current study did not have access to downstream care patterns, yet differential access to specialty care and prevention therapies likely contributed to the observed racial differences in long-term CVD outcomes.

The study by Golomb et al. (7) should also not be viewed in isolation but rather as part of a broader and consistent message of widespread racial disparities in America. The most recent example can be found in the current news headlines, where blacks have dramatically higher risk for COVID-19 infection and death relative to whites (17). Although less well studied to date, the underlying causes for these differences in the COVID-19 pandemic are likely to mirror those in the CVD disparities published reports.

How can racial health disparities be addressed moving forward? Bridging racial gaps in care and outcomes requires widespread commitment at the community, institution, and broader legislative levels. First, work needs to be done to accurately capture patient race and ethnicity in both clinical research and clinical care. Without proper collection, racial differences in care and outcomes can remain hidden. Next, broadening insurance coverage and improving access to high-quality health care should be a necessity for all. There is no excuse for one of the wealthiest nations on the planet to deny any patient access to basic care in the 21st century.

Quality assessment and improvement programs will also play an important role in overcoming health disparities. Pay-for-performance initiatives can incentivize health care organizations to implement effective programs to insure evidence-based care for all. Such programs should ideally account for differences in patient race and other socioeconomic factors, adjusting for these social risk factors to reduce penalties and reward improvement in safety-net hospitals (18,19). For example, a pay-for-performance intervention in the Department of Veterans Affairs system incorporated financial incentives for clinicians to improve blood pressure control in black patients (20). Beyond measurement and incentives, there needs to be more focus on understanding how care delivery can be improved for all patients. Although much has been invested in basic and clinical research, little is being spent on implementation science that can support the durable adoption of evidence-based therapies by all patients.

Finally, there is a need to increase the diversity of our health care workforce. Greater racial diversity among health care providers can promote cultural competency as well as lead to better patient satisfaction, engagement, and trust (21). Improving patient-physician communication in minority communities may have important implications for reducing the black-white cardiovascular mortality gap (22). Diverse researchers can also inform innovative clinical and research initiatives needed to reduce care bias and improve outcomes in underserved communities (23,24).

Solving racial health disparities is a crucial and pressing priority for all in health care. The findings from Golomb et al. (7) remind us just how large the racial gaps in CVD care and outcomes continue to be. Yet, rather than merely observe these differences over and over again for the next 30 years, there is an urgent need for action to address these, both locally and nationally. The recent unfortunate death of George Floyd has helped awaken the nation's consciousness to urgently address longstanding racial

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injustice. The medical profession too should seize this moment and find ways of reversing racial disparities in health and healthcare. Talking is no longer enough; it is our responsibility to finally deliver effective solutions.

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