Understanding Why Black Patients Have Worse Coronary Heart Disease Outcomes: Does the Answer Lie in Knowing Where Patients Seek Care?

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Although race is a social construct,[1] cardiologists must recognize that many cardiovascular health conditions are closely associated with self-reported race.[2] Specifically, the rates of intervention, treatment optimization, and clinical outcomes of coronary heart disease (CHD) are worse among black patients compared with white patients. Since the earliest descriptions of CHD statistics by race, black patients have had significantly lower rates of intervention than white patients.[3] This is despite the fact that black patients have substantially higher rates of risk-adjusted fatal CHD.[2,4] When presenting for acute myocardial infarction (AMI), black patients are disproportionately transferred to lower-quality hospitals and endure longer wait times before triage.[5] In addition, it has been shown that the hospitals that care for racial minorities may be limited in capability to perform needed interventions, like coronary artery bypass graft (CABG) surgery.[6] Race-based differences in hospital quality for CHD care have been well documented.[7–9] Some of the observed racial differences may be secondary to racial segregation.[7,10,11] Together, these findings suggest that geographic proximity to high-quality hospitals should be taken into account when evaluating CHD outcomes.[12]

In this issue of the *Journal of the American Heart Association* (*JAHA*), Popescu and colleagues use a regression and decomposition model to evaluate race-based differences in CHD care.[13] The results are meant to determine the relative contribution of either "geographic" or "nongeographic" factors in patients' use of high- versus low-quality hospitals. Hospital quality was defined using publicly available Centers for Medicare and Medicaid Services data for 30-day AMI mortality. Hospitals whose AMI mortality rate fell into the lowest quintile were deemed high quality. CABG mortality was not included in their definition of hospital quality. The 3 conditions on which the model is based include race (black or white), hospital quality (low or high), and disease entity (AMI or CABG). They also attempt to evaluate whether disease acuity ("emergent" AMI versus "elective" CABG) or region of the United States affects their findings. The authors use 2.5 years worth of national Medicare beneficiary data (July 2009–December 2011). The AMI cohort was composed of 35 561 black patients and 307 813 white patients treated at 2681 hospitals in 253 metropolitan areas. The CABG cohort was composed of 3055 black patients and 40 933 white patients treated at 1168 hospitals in 110 metropolitan areas. Rural residents were excluded. They define geographic access by the straight-line distance between the patient's listed ZIP code in Centers for Medicare and Medicaid Services and the hospital's street addresses. The authors adjusted for distance to hospital by including it as a continuous variable in the model. Other model variables included age, sex, and comorbidity.

Findings were that, irrespective of race, patients were more likely to use hospitals that were (1) closer to where they live and (2) of high or medium quality. In comparing white and black patients, some interesting patterns emerged. Specifically, 34.8% of white beneficiaries used high-quality hospitals for AMI compared with 32.4% of black beneficiaries. For CABG, 39.0% of white beneficiaries used high-quality hospitals compared with 29.9% of black beneficiaries. Both findings were statistically significant, but after adjusting for proximity, the AMI difference was no longer significant and the CABG difference decreased to 9.1% ($P<0.001$). They determined that the nongeographic component contributed to 3.4% of the difference between whites and blacks with AMI and 7.7% for CABG. Despite proximity, white patients were more likely to use high-quality hospitals for their CABG procedures. These data suggest that if a white person was having an AMI and he

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or she presented to a low-quality hospital, it would have been caused by nongeographic reasons. Meanwhile, notable regional findings imply that black patients are more likely to live near a hospital in the Midwest and are, therefore, more likely to use both high- and low-quality facilities for geographic reasons when compared with white patients. In the South, white patients were more likely to use high-quality hospitals for AMI and CABG for nongeographic reasons. In the Northeast, white patients were more likely to use high-quality hospitals for AMI. The authors state, "Taken together, the findings from regional analyses seem to suggest that a more geographically targeted, condition specific approach is needed for interventions to reduce CHD disparities." On the contrary, of the 16 regional analyses presented, strikingly few showed statistical significance. In aggregate, their data do not show meaningful regional trends to warrant specific interventions. It is reasonable to conclude, however, that nongeographic factors matter when deciding on elective CABG surgery.

The importance of this article lies in the statistical methods, which took an innovative approach to analyze the problem. In the creation of their model, the authors are attempting to answer whether white and black patients have access to different quality hospitals and given access to each hospital in their choice set, how likely is the patient to use each. This work adds to that of others who used observational data in attempt to determine if black and white patients have different outcomes despite using similar hospitals. Contrary to the work of Barnato et al, this study did not find differences in white and black patient's use of high-quality hospitals overall (the overall differences were null).[10] However, it was in decomposing the gap into geographic and nongeographic categories that statistically significant differences emerged. The present findings are similar to prior literature showing that black patients were less likely to use high-quality hospitals even if they were closer in proximity than their preferred hospital.[7] For the black-white gap in hospital quality, Barnato et al found that black patients used low-quality hospitals for medical treatment for AMI and high-quality hospitals for CABG (similar to trends found in the article by Popescu et al[13]), but had lower surgery rates when compared with white patients.[10]

The article by Popescu et al[13] has some limitations. The authors used Centers for Medicare and Medicaid Services data, which provide limited information for hospitals and Medicare beneficiaries aged 65 years and older. Although the data set was from 2009 to 2011, the authors assert relevance to today's CHD practice patterns. Their statistical model was contrived with many simplifications built into it. For example, the authors intentionally limited the cohort to only those living in metropolitan areas so that the longer distances to rural hospitals would not confound their conclusions about proximity. Because they did not have data for CABG outcomes in their data set, the authors used AMI mortality rate to define hospital quality for both AMI and CABG outcomes, a simplification that has not been previously validated. Although Popescu et al[13] attribute their findings to nongeographic sources, they recognize that these factors are "complex." By using a large epidemiological data set, the authors have added modestly to the existing data about possible contributors to the differences in CHD care for black patients in comparison with white patients.

The authors claim that their work will help guide future interventions for nongeographic factors, but before focusing on interventions, we need a better understanding of the mechanisms involved. Nongeographic factors may include peer social networks and physician referral networks,[14–16] racism/discrimination,[17] or several other currently unmeasured factors. If proximity does not matter, then some amount of patient preference is undoubtedly at play for black patients. The article by Popescu et al[13] suggests that this preference sensitivity has more of an affect for the relatively elective CABG procedure than it does for AMI treatment. These factors are certainly integral to the differences in hospital quality and, moreover, the differences in outcomes for white and black patients with CHD. To elucidate the complex nongeographic mechanisms, patient surveys, qualitative interviews, and social network analysis would provide additional insight into this challenging area.

The premise of the current work by Popescu et al[13] is predicated on the notion that high-quality hospitals would provide the best care to black patients. The definition and measurement of "quality" is important.[18] In this analysis, top quality was having had the least deaths from AMI. Whether blacks were disproportionally affected by AMI mortality in those hospitals is unknown. Others have shown that black patients are less likely to receive guideline-indicated CHD medications[19] or be referred for elective CABG[3,14] than are white patients. This unequal treatment occurs irrespective of the quality of the hospital.[10] The authors conclude that targeted interventions are needed to narrow the black-white gap in hospital quality. However, the more important task should be to ensure that the care provided to patients of all races is care that will lead to improved survival and equitable outcomes, irrespective of the hospital. This vision would serve to erase any race-based disparities in care for low- and high-quality hospitals alike. We know that the physicians who are devoted to the care of black patients have limited resources.[20] Hospital administrators should ensure that the physicians and providers caring for patients are well trained, culturally competent, and adequately equipped. The current lack of diversity among staff should be considered as a marker of hospital quality that must be recognized, measured, and tracked until improvements are made.

In the quest for racial equality, researchers and clinicians have fallen into the elitist mindset of "if we build it, they will come." In other words, we think that so long as black patients have access to our ivory towers and hallowed halls, their outcomes will improve compared with the care they are currently receiving elsewhere. An honest review of the literature reveals that access is not to blame because even when black patients are cared for at "high-quality" facilities, their outcomes are worse than white patients. Thus, understanding black patients' worse CHD outcomes is not only about where they seek care, but also how and why.

Disclosures

None.

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