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EDITORIAL

Racial and Ethnic Disparities in Aortic Stenosis

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Recognition of the impact of valvular heart disease on public health across diverse racial and ethnic populations in the United States is vital. However, racial and ethnic differences in prevalence, management, and outcomes for aortic stenosis (AS) and, in particular, severe AS, have remained largely understudied. Although the overall prevalence of AS in elderly people has been reported to range from 2% to 22%, with 1% to 6% having severe AS,[1] studies examining the prevalence of AS in different racial groups have reported lower rates of AS prevalence in Black patients.[2–4] In hospitalized patients aged ≥50 years, the overall prevalence of AS was ≈2% and was higher among White patients and higher-income groups.[3] Large echocardiographic studies have reported the prevalence of severe AS to be 0.3% and 0.9% in Black and White patients, respectively, with 5% to 10% of patients with severe AS being Black.[4,5] Although many cohort studies have compared the prevalence of AS between Black and White patients, few studies have assessed such epidemiologic data in patients of Hispanic and non-Hispanic ethnicities. One administrative study from Maryland revealed that hospitalization with an inpatient diagnosis of AS was 50% and 75% less common in Black and Hispanic patients, respectively, than in White patients.[6] Further data on AS prevalence, not to mention management and outcomes, across populations are greatly lacking.

See Article by Crousillat et al.

In this issue of the *Journal of the American Heart Association* (*JAHA*), Crousillat et al[7] evaluate racial and ethnic disparities in establishing diagnosis of AS in patients with echocardiographic demonstration of AS. Using echocardiographic data from Massachusetts General Hospital and Brigham and Women's Hospital, the authors identified 14 800 patients with AS (defined as aortic valve mean gradient ≥20 mm Hg), of which 4% were non-Hispanic Black, 2% were Hispanic, 2% were non-Hispanic Asian, and the remainder were 92% non-Hispanic White.[7] Of these 14 800 patients, ≈37% were given a diagnosis of AS, as defined by presence of an *International Classification of Diseases* (*ICD*) diagnosis for AS within 1 year of index echocardiography. Compared with non-Hispanic White patients (38%), non-Hispanic Black and non-Hispanic Asian patients had significantly lower rates of AS diagnosis (22.3% and 24.7%, respectively), whereas Hispanic individuals had similar rates of AS diagnosis (37.1%). In multivariate analysis, non-Hispanic Black (hazard ratio [HR], 0.65 [95% CI, 0.54–0.77]) and non-Hispanic Asian patients (HR, 0.72 [95% CI, 0.57–0.90]) were less likely to receive an AS diagnosis compared with non-Hispanic White patients. No significant difference in AS diagnosis was noted between Hispanic and non-Hispanic White patients (HR, 1.11 [95% CI, 0.91–1.3]). These disparities persisted even after limiting the population to those with at least moderate AS.

The American Heart Association has issued a recent Presidential Advisory[8] emphasizing the deleterious role that structural racism contributes to

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persistent health inequities and adverse health outcomes in the United States. The current study highlights significant disparities in coding of AS across the 4 racial/ethnic groups studied, with lower rates of AS diagnosis in Black and non-Hispanic Asian patients. Given this study only captures patients who have already been referred to undergo echocardiography, racial and ethnic disparities in referral for echocardiography are not known. If such differences exist, they would further augment the differences found and reported in this study.

Several additional considerations in this study warrant further discussion. First, this study diagnosed and classified severity of AS on echocardiography solely using mean aortic valve gradient. Hence, patients with low-flow, low-gradient AS in the setting of either reduced or preserved left ventricular ejection fraction (ie, paradoxical) were either not included or classified as AS of lower severity. In addition, by only using mean gradients, it is likely that patients with high output states and those with left ventricular outflow tract obstruction were mislabeled as having AS. The differences in prevalence of low-flow, low-gradient AS, high output states, or outflow tract obstruction between the different ethnic groups are unknown but could potentially exist and therefore contribute to some of the differences observed in coding patients as having AS.

Second, the study's definition of AS diagnosis relies on presence of an *ICD* diagnosis of AS in the patient's medical record 1 year following the index echocardiogram. The disparities in *ICD* coding may be the consequence of structural racism that has led to differences in multiple aspects of medical care, including patient history taking, examination, and education.[8] It is also possible that providers recognized the finding of AS on an echocardiogram and/or examination and included it in their progress note but failed to include it in their *ICD* coding. Other diagnoses may have taken higher precedence at the outpatient or inpatient encounter in Black and non-Hispanic Asian patients in this study. For instance, compared with White patients, Black patients with severe AS or those undergoing transcatheter aortic valve implantation (TAVI) do often have more comorbidities, including higher rates of hypertension, diabetes, and renal insufficiency.[5,9–11] It is unknown if providers only coded a primary and secondary diagnosis and failed to include additional diagnoses beyond these in their coding.

Finally, we do not know whether the disparities in diagnosis among the racial and ethnic groups reported in this study resulted in suboptimal management and worse outcomes, including increased mortality, increased hospitalization rate, and impaired quality of life. Several studies have demonstrated that Black, Hispanic, and Asian patients undergoing aortic valve replacement (AVR), including both surgical AVR and TAVI, in the United States have been underrepresented compared with what is predicted by population prevalence.[12,13] Earlier studies using administrative databases demonstrated that only 3% to 6% of patients undergoing AVR in the United States were Black and 1% to 7% were Hispanic.[11,12,14] Black patients with severe AS have significantly lower rates of AVR than White patients,[5,6,9,15,16] and nearly a 50% reduced risk-adjusted rate in those with an indication for AVR.[9] In hospitalized patients with AS, surgical AVR and TAVI were performed more often in White patients than Black patients, whereas similar rates were noted between Hispanic and White patients.[6] Studies of patients undergoing TAVI have identified <2% of patients as Black and <1% as Hispanic.[10] Rates of TAVI have also been reported as being lower in zip codes with higher proportions of patients of Black race and Hispanic ethnicity, despite adjusting for socioeconomic markers, age, and clinical comorbidities.[17] Despite disparities in rates of AVR, similar rates of risk-adjusted mortality in White and Black patients have been demonstrated following both surgical AVR[5,11,12] and TAVI.[10–13,18,19]

The inequities with diagnosis of AS (as seen in this study) and AVR referral rates are likely multifactorial and may include both differences in the part of the provider (eg, differences in diagnosis of AS and referral for appropriate treatment)[8,20] as well as of the patient (eg, possible differences in consenting for treatment).[5] Black patients with AS tend to have higher indexed aortic valve area, lower aortic valve gradients and peak velocities, less calcified valves, and more aortic regurgitation.[20] They have also been reported to have lower prevalence of stage D or symptomatic AS.[20] All of these factors may potentially affect referral for intervention at the provider level. Multifaceted public health interventions designed to improve provider and patient education, reduce barriers to communication, and enhance the provider-patient relationship are vital to further diminish health inequities across populations over time.

Ultimately, Crousillat et al provide a further awakening into the presence of disparities in provider diagnosis of AS after it is found on echocardiogram, across different races and ethnicities. It is evident from this study and previous literature that racial and ethnic disparities are present in both diagnosis as well as management of AS. Large-scale prospective registries of patients with AS (with availability of comprehensive data, including race and ethnicity, referral for further management, and any concerns on the patient level) are crucial for both understanding the effect of such discrepancies on outcome, as well as addressing methods to reduce these health care disparities over time.

ARTICLE INFORMATION

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