

## EDITORIAL COMMENT

# Ethnic and Racial Disparities in Pediatric Cardiac ECMO Utilization



## Do They Exist, Does It Matter?\*

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Disparities in outcomes of pediatric patients with cardiac disease have long been noted in medical literature. Studies identify numerous factors including insurance payor, race/ethnicity, distance from a specialized care center, and the highest level of maternal education, as impacting a wide range of outcomes including prenatal diagnosis, postoperative morbidity and mortality, long-term health outcomes, family quality of life, and hospitalizations.<sup>1-4</sup> Multiple studies specifically note an association between minority race/ethnicity and higher mortality.<sup>5-7</sup> Other studies confirm the impact of the environment (Childhood Opportunity Index and zip code) and outcomes after congenital heart surgery.<sup>8,9</sup> Indeed, the American Heart Association recently published a scientific statement addressing the significant impact of social determinants of health for patients with congenital heart disease across the lifespan.<sup>10</sup> However, the etiology of these differences has not been fully elucidated. Authors posit that differences in referral patterns, access to care, surgical technique, and use of extracorporeal membrane oxygenation (ECMO) contribute to these differences.<sup>5,11</sup> At least one study notes that severity of illness (SOI) mediates worse outcome for Black

patients.<sup>12</sup> However, previous studies utilized data from administrative databases without granular clinical detail to fully delineate possible confounders and mediators that may impact these outcomes.

Brunetti et al<sup>13</sup> sought to determine if racial/ethnic variation in ECMO utilization exists and, if it does, whether mortality is mediated by those differences. Using over 50,000 hospitalizations from the Pediatric Cardiac Critical Care Consortium (PC<sup>4</sup>) registry, the authors reported that Black and other race patients who were hospitalized for surgery had higher odds of ECMO utilization compared to White patients. Patients admitted for medical hospitalizations did not differ in ECMO utilization by race/ethnicity. The authors found that patients of other races who were admitted for medical hospitalizations and Hispanic patients admitted for surgical hospitalizations had statistically higher odds of mortality compared to White patients. However, these differences in mortality were not explained by differences in ECMO utilization by race/ethnicity. To examine the impact of socioeconomic status (SES) on ECMO utilization, the authors used zip code data to index the SES of their patient population. They did not observe a statistically significant association between SES index on ECMO utilization or outcomes. Finally, the authors describe significant differences in pre-hospital status including unplanned cardiac intensive care unit (CICU) admissions and complications (heart failure, transplant rejection, and mechanical ventilation within 2 hours of admission) for non-White patients suggesting a higher SOI.

Brunetti et al are to be commended for using a large, detailed database to examine racial/ethnic and socioeconomic disparities in ECMO utilization in the pediatric CICU population. They highlight important disparities in outcomes for non-White patients that differ from previous research. With a large sample

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size, geographic diversity, more clinical granularity than is available in most datasets, and more recent data, the data collected by PC<sup>4</sup> and utilized by the authors is well suited to examine population questions of racial and ethnic disparity. However, the dataset and authors' methodology have some important limitations. First, the PC<sup>4</sup> data set does not include a standardized measure of SOI. The authors note that they used "proxies for SOI" but fail to detail the exact variables that they use for adjustment. SOI is a potentially powerful mediator of racial disparities and raises concerns about differences in outcomes that relate to disparities in access to care.<sup>12,14</sup> Clarity surrounding the proxies for SOI would strengthen the author's findings, especially given that the authors found numerous disparities in ECMO utilization (higher in Black patients) and mortality (higher in Hispanic patients). To us, these disparities hint at important but unexplored racial and ethnic differences that Brunetti et al fail to address. Other limitations pertain to the authors' use of zip code data as part of their SES index. As the authors note, only 60% of the cohort had zip code data, and zip code data is suboptimal in pinpointing the true environment of the child and family. Census tract data provides far more granular information.<sup>15</sup> Finally, Brunetti et al<sup>16</sup> fail to highlight potential differences in prenatal diagnosis of congenital heart disease, which may also explain racial or ethnic outcome differences.

Modern medicine must reckon with the long-noted racial differences in health outcomes of our patients. Improving equity involves understanding where and why disparities exist. The Brunetti et al<sup>16</sup> work adds

important insights to disparities in children with heart disease admitted to CICUs. They find that non-White patients had higher SOI and higher ECMO utilization, and Hispanic patients had higher odds of mortality. Their analysis does not answer, however, the important and central question of why these differences in outcomes, ECMO utilization, and mortality exist. While the authors do not assert that unmeasured genetic or biological factors may account for racial differences in health outcomes (and they should be congratulated for not doing so!), their discussion also does not critically examine the fundamental cause of disparity.<sup>17</sup> Until our research can explicate the potential role of societal factors, such as racism or implicit bias, and possible solutions, we must continue to search for answers. Until we gain more insight into the mechanism(s) of these discrepancies, one can only hope that awareness of these issues might mitigate what we all hope is not happening (but could well be true), that we as health care providers are somehow part of the problem.

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