Racial Disparities in Proximal Aortic Surgery: Myth or Reality?

Objective: It is unclear whether racial disparities affect adverse outcomes in patients undergoing cardiac and aortic surgery. We evaluated the relationship of race to short- and long-term outcomes in patients who underwent proximal aortic surgery at our academic center.

Methods: Over a 20-year period, 2335 consecutive patients underwent surgery in the ascending aorta or aortic arch and identified their race as either Black or White. Using the public domain unitedstateszipcodes.org database, we associated these patients’ zip codes at the time of their index operation with socioeconomic (SE) characteristics. We then used propensity-score matching to balance patient characteristics, including SE factors, between Black and White patients. Adverse outcome comprised mortality, persistent stroke, and renal failure necessitating dialysis at discharge. All early outcomes for the propensity-matched groups were compared by using the paired t-test for dichotomous variables and the Wilcoxon signed rank test for continuous ones. Group differences were also analyzed with multivariable analysis and Kaplan-Meier (KM) survival curves.

Results: Median follow-up was 3.7 years. In the unmatched cohort, compared with White patients (n=2118, 90.7%), Black patients (n=217, 9.3%) lived in areas characterized by lower income (50,454 USD vs 69244 USD p<0.0001) and lower likelihood of having at least a Bachelor's degree (19.8% vs 31.0% p<0.0001), more often had an emergency presentation (55.8% vs 24.5% p<0.0001), had higher rates of respiratory failure (41.9% vs 28.6% p<0.0001), longer hospital stays (20.0 vs 15.7 d p< 0.0001), and poorer survival at 5 years (53.5% vs 70.4%) and 10 years (33.7% vs 49.6%) (p=0.0004). Among 204 propensity-matched pairs, Black and White patients had similar rates of adverse outcome (14.7% vs 12.3% p=0.44), operative mortality (8.8% vs 9.3% p=0.87), renal failure (7.4% vs 8.3% p=0.68), and respiratory failure (40.2% vs 40.7% p=0.92) and identical rates of persistent stroke (3.4%). Similarly, multivariable analysis did not show race to be a predictor of adverse outcomes. The propensity-matched patients' KM survival curves showed 5- and 10-year survival rates of 56.2% and 35.4% in Black patients versus 66.6% and 43.4% in White patients (p=0.28) (Figure).

Conclusions: Our study is one of the first to analyze racial variations in the outcomes of proximal aortic surgery. Although Black race was associated with worse outcomes on unadjusted analysis, this association vanished after adjustment for SE factors with propensity matching, suggesting that SE factors contribute to racial disparities in short-term outcomes. Long-term survival was non-significantly better in White patients. More and larger studies are needed to evaluate the potential association of race and specific SE factors with adverse outcomes and to analyze risk-mitigation strategies in aortic surgery.

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Product-Limit Survival Estimates
With Number of Subjects at Risk and 95% Equal Precision Bands

Logrank p=0.2814

Survival Probability

Years Since Surgery

Race
Black  White

Black  204  115  96  63  36  30  18  12  6
White  204  115  77  51  34  21  12  8