Introduction

Socioeconomic status (SES) is a known factor influencing morbidity and mortality.

CDC’s social vulnerability index (SVI) quantifies neighborhood-level vulnerability.

Although high SVI has been associated with adverse outcomes in trauma, CABG, and AAA repair, its impact on aortic arch surgery remains unknown.

It is predicted that in total aortic arch (TAR) and hemiarch aortic arch (HAR) replacement, higher SVI will correlate with increased comorbidities, surgical acuity, and post-operative morbidity and mortality.

Methods

The single center retrospective study examined adult patients undergoing HAR and TAR performed for aortic aneurysm and/or dissection between 2010 and 2022.

SVI was calculated by patients’ residential ZIP code.

The cohort was stratified into three groups:

1. SVI < 0.33
2. SVI 0.33 – 0.66
3. SVI ≥ 0.66

The primary endpoint was post-operative mortality, with control for confounding bias through multivariable logistic regression.

Results

Hernia

Partial arch

Total arch replacement

Figure 1. Visual depiction of hemiarch vs partial arch vs total arch replacements

Discussion

For 753 patients, higher SVI correlated with more baseline comorbidities and minority status.

SVI was associated with dissection pathology (p=0.04) and urgent/emergent procedures (p=0.02).

Higher SVI was associated with TAR (p=0.01) as reflected by lower nadir bladder temperatures (p=0.01), longer cardiopulmonary bypass (p=0.02), longer circulatory arrest times (p=0.01), and more coagulation product usage.

High SVI patients had longer length of stay, higher rates of infection (p=0.01), and a trend towards increased stroke risk.

SVI did not correlate with in-hospital or late mortality.

Conclusions

In socially vulnerable communities, patients who require aortic arch surgery have more comorbidities, present urgently or emergently with dissection pathology, and require more extensive arch repair.

Post-procedure, they have a higher risk of infection and a trend toward more stroke risk, but not higher rates of other adverse outcomes or increased mortality during or after hospital stay.