Survival After Repair for Degenerative Mitral Regurgitation - Therapeutic Targets to Mitigate Socioeconomic Disparities

Objective: The impact of socioeconomic disparities on survival after mitral repair is poorly defined. We examined the association between socioeconomic disadvantage and mid-term outcomes of repair in Medicare beneficiaries with degenerative mitral regurgitation.

Methods: United States Centers for Medicare and Medicaid data was used to identify 10,390 patients undergoing isolated repair for degenerative mitral regurgitation between 2012 and 2019. Patients with prior heart transplant (n=49) or previous mitral surgery (n=19) were excluded. Zip code-level socioeconomic disadvantage was dichotomized with the Distressed Community Index (DCI) which incorporates education level, poverty, unemployment, housing security, median income, and business growth; those with DCI score > 80 were classified as distressed. The primary outcome was survival. Secondary outcomes included cumulative incidences of heart failure readmissions and mitral reinterventions, with death as a competing risk. The independent effect of socioeconomic distress on mortality was analyzed using a multivariable Cox model. Median follow-up time was 4.4 years; patients were censored at 3 years for survival and time-to-event analyses.

Results: Of the 10,322 degenerative patients undergoing mitral repair, 9.7% (n=1003) came from distressed communities. These patients were more often female (55.3% vs. 50.5%), black (11.6% vs 2.7%), and had a higher comorbidity burden (all p<0.01). Patients from distressed communities underwent surgery at lower volume centers (annual volume 8.8 vs. 14.5 cases) and traveled further for surgical care (40.1 vs. 17.1 miles) (all p<0.001). At 3 years, unadjusted survival (85.4%, 95% CI: 82.9-87.5% vs. 89.7%, 95% CI: 89.0-90.4%) and cumulative incidence of heart failure readmission (11.5%, 95% CI: 9.6-13.7% vs. 7.4%, 95% CI: 6.9-8.0%) were worse in patients from distressed communities (all p<0.001), while mitral reintervention rates were similar (2.7%, 95% CI: 1.8-4.0% vs. 2.8%, 95% CI: 2.5-3.2%, p=0.75). After adjustment, community distress was independently associated with 3-year mortality (HR: 1.21, 95% CI: 1.03-1.47) and heart failure readmissions (HR:1.25, 95% CI: 1.01-1.55).

Conclusions: Socioeconomic distress is an independent predictor of worse outcomes in degenerative mitral repair among Medicare beneficiaries. Future efforts at alleviating these disparities could focus on guideline-concordant management of heart failure.

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Survival Stratified by Community-Level Socioeconomic Distress
With Number of Subjects at Risk and 95% Confidence Limits

Logrank p < .0001

Survival Percentage (%)

Time After Surgical Mitral Repair (Years)

<table>
<thead>
<tr>
<th>Distressed Community Index Level</th>
<th>Distressed</th>
<th>Not Distressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distressed</td>
<td>1003</td>
<td>9319</td>
</tr>
<tr>
<td>Not Distressed</td>
<td>911</td>
<td>8583</td>
</tr>
</tbody>
</table>

Distressed Index Levels: 855, 804, 746, 692, 647
Not Distressed Index Levels: 8052, 7634, 7153, 6654, 6165