Reappraisal of the Impact of Institutional Volume on Outcomes After Heart Transplantation

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BACKGROUND

- Institutional volume has been shown to impact outcomes in heart transplantation (HT). With lower volume centers demonstrating lower overall patient survival.[1,2]
- This relationship has not been studied in the most recent era following the heart allocation change in 2018.

PURPOSE

This study provides a reappraisal and analysis of the volume-outcomes relationship in HT in the modern era.

METHODS

- United Network for Organ Sharing registry was used to identify all adult patients 18 years or older undergoing isolated HT from October 18, 2018 to December 31, 2023.
- Patients were categorized into low, moderate, and high-volume tertiles based on center-level volume.
- The primary outcomes were 90-day and 1-year survival rates. Secondary outcomes included postoperative stroke, need for pacemaker, length of stay, acute renal failure, and acute rejection.
- HT volumes were analyzed as a continuous and categorical variable, univariable and multivariable Cox regression analyses were conducted for 90-day and 1-year survival. Kaplan Meir analyses were performed and compared.
- Loess smoothing plot and sequential receiver operating characteristics were used to demonstrate the optimal HT volume threshold for 90-day and 1-year survival.

RESULTS

Figure 1. Kaplan-Meier Curve for 1-Year Survival after Heart Transplantation stratified by center volumes.

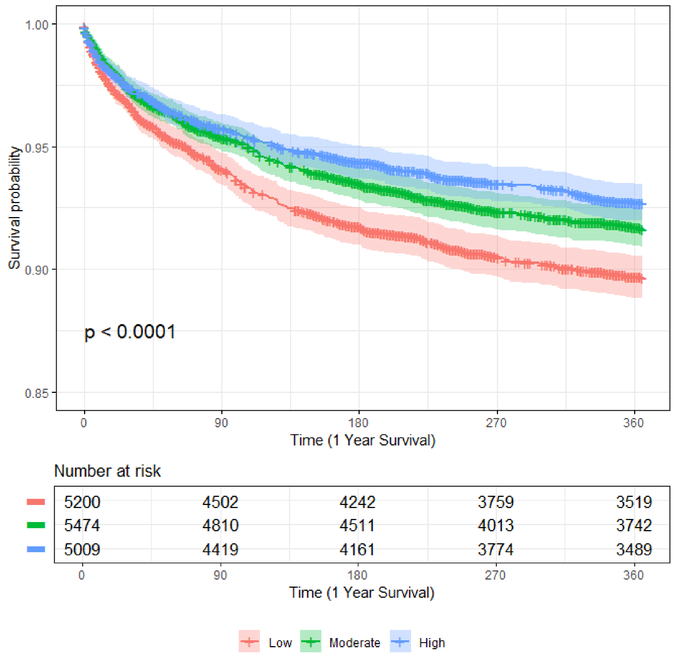
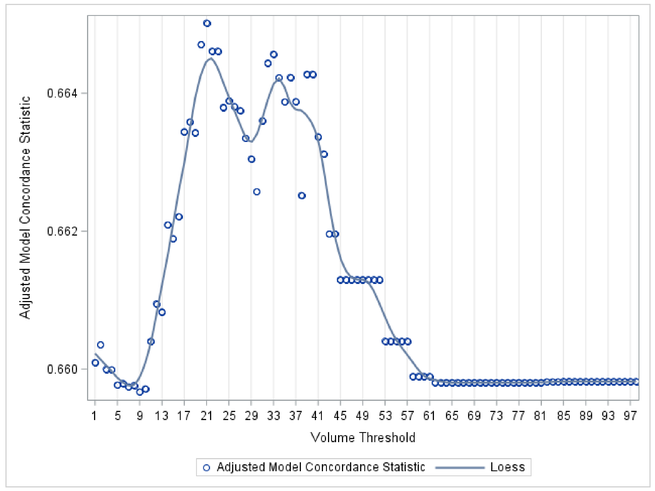


Figure 2. Loess smoothing plot for 1-year mortality.



- 90-day (94.3% vs 95.9%, p =.0005) and 1-year survival were higher in high-volume centers (90.5% vs 93.3%, p <.0001) when compared to low-volume centers.
- In low-volume centers the hospital stay was longer (18 vs 16 days, p <.0001), and the need for a pacemaker at discharge was higher (2.1% vs 1.3%, p =.003) when compared to high-volume centers.
- Acute rejection before discharge was lower in high-volume centers (10.4% vs 8.8%, p =.01) when compared to low-volume centers.
- After risk adjustment, undergoing HT at low-volume centers was predictive of 90-day (HR 1.48, p <.001) and 1-year mortality (HR 1.51, p <.001).
- When modeled as a continuous variable, higher center volume was less likely to have 1-year mortality with HR .995.

CONCLUSIONS

- The volume-outcomes relationship remains important in the current allocation era.
- The optimal threshold for improved survival has increased compared to historical thresholds.
- Further analysis is necessary to identify the most important center-level influencing factors.

REFERENCES

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