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The Impact of Center Volume on Survival in Lung Transplantation: An Analysis of More Than 10,000 Cases

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Background

Whether center volume influences outcomes in lung transplantation is unknown. We reviewed United Network for Organ Sharing data to examine the effect of center volume on short-term mortality.

Methods

We reviewed United Network for Organ Sharing data (1998 through 2007) to identify 10,496 first-time adult lung transplantation recipients at 79 centers. Centers were stratified by quartiles of mean annual volume. Risk of 30-day mortality and 1- and 5-year

ranked by quartiles of mean annual volume. Risk of 30-day mortality, and 1- and 5-year mortality (censored for 30-day death) were assessed by multivariable Cox proportional hazards regression.

Results

Mean center volume ranged from less than 1 to 58.2 (median, 9.4 cases/year; volume quartiles: 0 to 2.1, 2.2 to 9.4, 9.5 to 19.9, and 20 to 58.2 cases). Each 1 case/year decrease led to a 2% increase in 30-day mortality (hazard ratio, 1.02; 95% confidence interval, 1.01 to 1.02; $p < 0.001$). Centers of lowest quartile (performing ≤ 2.1 lung transplantations/year) had a 30-day cumulative mortality of 9.6% or 89% increase in the risk of death (hazard ratio, 1.89; 95% confidence interval, 1.01 to 3.44; $p = 0.05$) compared with the highest quartile centers despite fewer idiopathic pulmonary fibrosis patients (15.6% versus 25.8%; $p < 0.001$) and younger age (40.9 versus 51.5 years; $p < 0.001$). Low-volume centers had double the risk of 30-day censored 1-year mortality (hazard ratio, 1.95; 95% confidence interval, 1.30 to 2.92; $p = 0.001$). High-volume centers (≥ 20 lung transplantations/year) had the lowest 30-day mortality (4.1%).

Conclusions

We provide an initial examination of the relationship of volume and lung allocation score to outcomes for lung transplantation. Low center volume is associated with increased short-term and cumulative mortality despite fewer idiopathic pulmonary fibrosis patients and younger patients.



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