Outcomes of lung transplantations since implementation of need-based allocation system

3 March 2015

Since implementation of a medical need-based allocation system of donor lungs in 2005, double-lung transplantation has been associated with better graft survival than single-lung transplantation in patients with idiopathic pulmonary fibrosis (IPF); at 5 years, there has been no survival difference between single- and double-lung transplant recipients in patients with chronic obstructive pulmonary disease (COPD), according to a study in the March 3 issue of *JAMA*.

Before 2005, lung transplant allocation in the United States was based on accumulated time on the lung transplant waiting list after matching for ABO blood type. In response to increasing wait times, the U.S. Department of Health and Human Services mandated the development of an allocation system based on medical need instead of waiting time. The resulting system—the Lung Allocation Score (LAS) organ allocation algorithm—was implemented in May 2005. A patient's LAS is based on risk factors associated with either wait list or post-transplantation mortality. The use of the LAS has brought with it a change in the demographics of single- and double-lung transplant recipients; what effect this may have on post-transplantation outcomes has not been assessed, according to background information in the article.

Hari R. Mallidi, M.D., of the Baylor College of Medicine, Houston, and colleagues reviewed data from the United Network for Organ Sharing thoracic registry to summarize the contemporary demographics and outcomes in adults with IPF or COPD who underwent single- or double lung transplantation in the United States between May 2005 and December 2012.

Since May 2005, the researchers identified 4,134 patients with IPF (of whom 2,010 underwent single-lung and 2,124 underwent double-lung transplantation) and 3,174 patients with COPD, of whom 1,299 underwent single-lung and 1,875 underwent double-lung transplantation. The median follow-up time was 23.5 months. Of the patients with IPF, 33.4 percent died and 2.8 percent underwent retransplantation; of the patients with COPD, 34.0 percent died and 1.9 percent underwent retransplantation. Further analysis indicated that double-lung transplants were associated with better graft survival in patients with IPF (adjusted median survival, 65.2 months vs 50.4 months) but not in patients with COPD (adjusted median survival, 67.7 months vs 64.0 months).

"The interaction between diagnosis (COPD or IPF) and treatment type (single- and double-lung transplantation) was significant, supporting the finding that the benefit of double-lung transplantation may differ by diagnosis. Likewise, prognostic models designed to account for the timevarying effect of double-lung transplantation (compared with single-lung transplantation) showed that double-lung transplantation was significantly associated with graft survival among patients with IPF but not among patients with COPD," the authors write.

Other variables associated with graft failure included age, excessively high or low body mass index, worse functional status, poor 6-minute walk test performance, pulmonary hypertension (in patients with COPD), and donor age. Variables associated with graft survival included undergoing transplantation at a high-performing center, undergoing transplantation at a moderate- or high volume transplant center, receiving a locally allocated organ, and donor-recipient race match (in patients with IPF).