



STS Press Release

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Lung Transplant Patients May Fare Better with Larger Organs

Using a predicted total lung capacity ratio may help improve matching process

Chicago – A higher predicted total lung capacity ratio, suggestive of oversized donor lungs, is associated with improved survival following lung transplantation, primarily among patients who undergo double-lung (bilateral) transplants, according to a new study in the August 2013 issue of *The Annals of Thoracic Surgery*.

“An unresolved question in the field of lung transplantation is how the size of the donor lungs relative to the recipient affects transplant success,” said lead author Michael Eberlein, MD, PhD, from the University of Iowa Hospitals and Clinics in Iowa City. “It is commonly believed that transplanting oversized lungs is problematic, but no data were available to substantiate that idea.”

Currently in the United States, lung transplant candidates are listed by designated donor height ranges, as height is used to estimate lung size.

Another way to determine organ size matching is by using a “predicted total lung capacity” (pTLC) ratio. The pTLC is estimated by height and sex. Taller people have larger lungs, and a man’s lungs are larger than lungs in a woman of the same height. The pTLC-ratio is determined by dividing the donor’s pTLC by the recipient’s pTLC. A ratio of 1.0 is a perfect size match, whereas, for example, a ratio of 1.3 indicates that the donor lung is significantly larger than the recipient’s lung.

Dr. Eberlein and colleagues used data from the United Network for Organ Sharing (UNOS) lung transplant registry for all adult patients (aged 18 years and older) who underwent first-time lung transplantation between May 2005 and April 2010. Of the 6,997 patients included in the study, 4,520 underwent bilateral lung transplant (BLT) and 2,477 underwent single lung transplant (SLT).

Key Points

- A higher predicted total lung capacity ratio—usually from larger donor organs—is associated with improved survival following lung transplantation, particularly among patients receiving bilateral lung transplants.
- Currently in the United States, lung transplant candidates are listed according to donor height ranges.
- The pTLC ratio allows for a more standardized way of matching donor lungs, compared to the height method, and may help increase utilization of lungs.

Among patients in the BLT group, each 0.1 increase in the pTLC-ratio was associated with a 7% decrease in the risk of death at 1 year post-transplant. This decrease was independently associated with improved survival following additional adjustment to account for any bias from oversizing.

Among SLT patients, each 0.1 increase in pTLC-ratio was associated with a 6% decrease in the risk of death at 1 year post-transplant; however, this association was not present following the same additional adjustment to account for any bias from oversizing.

“Our study suggests that transplantation of oversized lungs does not compromise patient survival; on the contrary, we found that oversized allografts, up to a point, were associated with improved survival after lung transplantation,” said Dr. Eberlein. “We would hope that recipients, within surgically feasible limits, could be listed for higher donor height ranges and ultimately have a better chance of receiving an acceptable donor lung.”

Need for Standardized Method of Matching Lung Donors

In an editorial in the same issue of *The Annals*, Seth D. Force, MD, from Emory University School of Medicine in Atlanta, commented on the need for a standardized method of matching lung donors. “The real strength of this study may be in showing that utilizing pTLC allows for a more standardized way of matching donor lungs compared to the height method,” said Dr. Force.

“Utilizing a methodology that has some data behind it, as opposed to matching by height, may actually increase utilization of lungs by allowing centers to feel more comfortable with significant size discrepancies between donor and recipient lungs,” said Dr. Force. “The data in this manuscript make a compelling argument for the lung transplant community, as well as UNOS, to consider changing to a pTLC method for lung sizing for listed patients.”

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For a copy of the study or editorial, contact Cassie Brasseur at 312-202-5865 or cbrasseur@sts.org.

Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 6,600 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society’s mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy.

The Annals of Thoracic Surgery is the official journal of STS and the Southern Thoracic Surgical Association.