Body mass index in lung transplantation: Every unit counts

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Lung transplantation continues to have the lowest long-term survival of any solid-organ transplant, with a median survival of approximately 6 years.¹ Greater appreciation for the granularity of risk factors may lead to more informed decisions made at the time of listing with greater prognostic value.

In this issue of the *Journal*, Fernandez and colleagues² report a retrospective analysis of mortality per body mass index (BMI) unit, using the Scientific Registry of Transplant Recipients database.² Logistic regression modeling of 17,233 patients in the study revealed that BMI was an independent predictor of mortality at both 90 days and 1 year. Although the concept of BMI having an association with survival is not of itself novel, because of the large sample size, the authors found that *each individual BMI unit* had a quantifiable effect on mortality. The value of using BMI as a continuous variable reveals a nadir of 90-day risk at a BMI of 25 and 1-year risk at a BMI of 26, suggesting that traditional clustering of BMI into groups may be an oversimplification as to the prognostic value of BMI in lung transplantation.

The results of the study provide an opportunity to better understand risk associated with BMI at the time of recipient listing. As the investigators highlight, a person with a “normal BMI” of 20 has a higher risk of 1-year mortality than a recipient with an “obese BMI” of 32 (1.31 ± 0.15 vs 1.25 ± 0.17 , respectively). Furthermore, the population with the lowest mortality risk would be classified as overweight, because even a BMI less than 24 is associated with decreased 1-year survival. The protective nature of being overweight at the time of transplantation may be reflected by the significant perioperative stress and weight loss that occurs after lung transplantation.³ This suggests that despite the primary focus being on weight loss, which is appropriate for patients with a BMI greater than 30,⁴ there needs to be a greater emphasis placed on nutritional weight-gaining strategies for patients with seemingly normal BMIs, specifically a BMI less than 24. There is often no controversy when accepting potential patients for listing

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Central Message

Recipient BMI represented as individual units has significant prognostic value, and nutritional strategies to optimize this continuous variable may improve outcomes in lung transplantation.

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with a BMI of 20 to 24; however, the current study suggests that aggressive nutritional strategies should remain in place to avoid further weight loss and perhaps encourage weight gain, especially of further muscle mass. Although there has been a long understanding of the detriments of recipient cachexia, there may now be further consideration to maintain recipient weight slightly higher than a normal class.

The current study demonstrates that accurate representation of grouped data requires that the inflection point between outcomes must occur at the transition points between groups; otherwise, the heterogeneity within a group may confound the results. Increasing the granularity of data by using continuous variables over grouped variables is gaining notoriety. Borders and colleagues⁵ recently described massive transfusion after lung transplantation. They also concluded that there is a lack of value in grouping continuous variables, because arbitrarily grouping transfusion units did not allow for the characterization of risk associated with each unit of blood transfused.⁵

Taken together, the opportunity to analyze larger datasets with higher definition provides further opportunity to improve outcomes in lung transplantation, and the added value of recipient BMI represented as individual units has significant prognostic value.

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