Although we cited reference 30 (cited here as reference 2) under Subjects in the Materials and Methods section, it might have been better to also cite it under Estimation of Sleep Duration in the Materials and Methods section. Altogether, we believed that the use of the actigraph along with the diary for the purpose of the two studies would be superior to the use of only a sleep diary.

As Dr Kawada mentioned, sleep duration was a key factor in this study, and the participants wore the actigraph for 7 days so we could measure the mean daily sleep duration. An actigraph (Actiwatch AW-Light; Mini Mitter or Koninklijke Philips Electronics NV) has been used in many reports. We believed that the use of the actigraph as described here was suitable for this study.

We appreciate the comments of Dr Kawada. They enabled us to provide details of our method for calculating sleep duration that were only briefly provided in our article.1

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DOI: 10.1378/chest.13-1932

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Prolonged Extracorporeal Membrane Oxygenation Use as a Bridge to Lung Transplantation

It Is Time for a National Registry

To the Editor:

We read with great interest the article by Crotti et al1 in a recent issue of CHEST (April 2013). The authors present their experience with 17 patients who underwent extracorporeal membrane oxygenation (ECMO) prior to lung transplantation in two centers in Italy. In this series, patients who underwent transplantation “early” had better outcomes compared with those undergoing transplant “late,” defined as a waiting time on ECMO ≥ 14 days. Overall 1-year survival was 76% (100% in the early group vs 50% on the late group). The authors concluded that duration of ECMO is an important cofactor for mortality before and after lung transplantation.

The use of ECMO pretransplant has been controversial and considered by some as a contraindication to lung transplantation. ECMO was used in the past in cases of acute clinical deterioration as a life-saving therapy. By contrast, ECMO now can be used in patients to allow ambulation and rehabilitation and to prevent or reduce mechanical ventilation use.2,3 Recent series of patients undergoing transplant using ECMO in the United States have reported good midterm and long-term outcomes, with survival rates exceeding those undergoing transplant while on mechanical ventilation.4,5 In our recent report describing 31 patients bridged with ECMO, we observed a 1-year survival rate of 83% among those with prolonged ECMO use.6 Similarly, Toyoda et al4 reported 24 patients bridged with ECMO with a 1-year survival rate of 74%, although the authors report a higher incidence of primary graft dysfunction and posttransplant ECMO use compared with nonsupported patients.

Although we agree with the authors that prolonged ECMO use may increase the risk of mechanical complications pretransplant (ie, hemolysis, thrombosis, hemorrhage, and so forth), we believe that the current level of evidence is insufficient to conclude that prolonged ECMO (vs short ECMO use) results in worse outcomes after lung transplantation. Although we recognize the possible risks associated with ECMO, we hypothesize that many other factors may impact survival in this small and selected subgroup of patients. For example, center-specific lack of experience with prolonged ECMO use and selection bias (prolonged ECMO use may reflect “sicker” patients and, therefore, higher frequency of marginal organ quality use) may negatively impact outcomes.

Can we translate the findings of this study to other practice settings? In the United States, the Lung Allocation System is based on survival probability and currently does not factor ECMO use, although these patients often have a high score.4 The uncertainty regarding ECMO benefits raises ethical concerns about organ waste and preferential use of marginal allografts or cadaveric lobar transplants. For example, Toyoda et al4 reported more frequent use of cadaveric lobar lung transplantation compared with “nonsupported” patients. We believe that this article should help stimulate a national dialogue to determine optimal use of ECMO as a bridge to lung transplant, consider its impact on organ allocation systems, and promote the creation of a national registry of ECMO use in respiratory failure (including those awaiting lung transplantation). Only then will we be able to answer some of the clinical and ethical questions surrounding ECMO use among these seriously ill patients.

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DOI: 10.1378/chest.13-2107

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Response

To the Editor:

We thank Dr Venado and colleagues for their interest in our article. In a series of 25 patients already listed for lung transplantation, we started extracorporeal membrane oxygenation (ECMO) bridging after acute severe deterioration, with a 76% 1-year survival in 17 patients who underwent transplant. We observed a striking effect of ECMO duration on overall mortality as well as on posttransplant mortality and morbidity.

Dr Venado and colleagues, underlining that patients undergoing transplant after ECMO bridging have a good outcome, express some skepticism about the relationship between ECMO duration and unfavorable results. When considering all patients admitted to an ECMO bridge program and pooling together bridges of different duration, a good 1-year survival rate does not imply that ECMO duration is irrelevant. Indeed, the effects of bridge duration cannot be inferred from the data reported in the Toyoda et al. case series. In the report of Hoopes et al., we observe a trend toward lower 1-year survival in long-term ECMO, with eight of 10 survivors in the >14-days group, compared with 21 of 21 in the ≤14-days group. More specifically, in our study, mortality increased with each additional day on ECMO, not only during the ECMO bridge but also after transplantation, when ECMO bridge had been >2 weeks.

Correctly, Dr Venado and colleagues point out that outcome depends also on the experience in prolonged ECMO as well as on the use of marginal-quality organs. Our center in Milano has used ECMO in ARDS for >30 years and has successfully treated many patients with ARDS with prolonged ECMO. As for the role of marginal donors, this is discussed and excluded in our article (see e-Appendix 2 in our article).

We speculate whether the effects of ECMO bridge duration depend on the side effects of ECMO or on the severe pathologic condition of the patients. In our series of critically ill patients, ECMO was just a makeup for blood gases and hemodynamics, and only transplantation could resolve a patient’s critically ill status. In this context, the shorter the waiting time, the lower the risk associated with being critically ill. ECMO bridge time may be different for patients amenable to a substantial improvement of their critically ill status (to the extreme of bridge to recovery). Considering the difficulties in predicting subsequent patient evolution at the beginning of the bridge, we maintain that prioritizing organ allocation to ECMO-bridged patients will benefit the overall outcome of this population.

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DOI: 10.1378/chest.13-2107

ACKNOWLEDGMENTS

Other contributions: The work was performed at the Ospedale Ca’ Granda of Milan and Policlinico San Matteo of Pavia, Italy.

REFERENCES


The Natural History of Flock Worker’s Lung

To the Editor:

In a recent article in CHEST (June 2013), Turecotte et al. presented incomplete, poorly defined, and uninterpretable data that contribute little to our understanding of flock worker’s lung. In 1995, when the authors first reported on five of these same patients, they erroneously characterized the pulmonary pathology as being that of desquamative interstitial pneumonitis and incrimi-