CORRESPONDENCE

Extracorporeal Pulmonary Support in Severe Pulmonary Failure in Adults: A Treatment Rediscovered

by PD Dr. med. Thomas Müller, Prof. Dr. med. Thomas Bein, Alois Philipp, Prof. Dr. med. Bernhard Graf, Prof. Dr. med. Christof Schmid, Prof. Dr. med. Günter Riegger in volume 10/13

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Conflict of interest statement
The department of Anaesthesia and Critical Care at the University Hospitals of Würzburg is a specialised ARDS/ECMO center under the direction of PD Dr Ralf Muellenbach.
The authors declare that no conflict of interest exists.

Quality Assurance Would Be Welcome

We congratulate our colleagues on their comprehensive review article on using extracorporeal lung support devices in patients with acute pulmonary distress syndrome (ARDS) (1). Technical improvements and the challenges in the context of the H1N1 influenza pandemic have undoubtedly led to a renaissance of extracorporeal membrane oxygenation (ECMO). The promising trend towards a reduced mortality associated with increasing experience in using the technique, as described by the authors, is indisputable and supports a recent publication from the United Kingdom's ECMO-centers (2). Nevertheless this confirms primarily the positive correlation between dedicated center-based experience in treating severe ARDS and outcome, also mentioned in different expert discussions.

For this reason, the encouraging data from Regensburg and other specialized ECMO-centers should not prompt the uncritical popularization and use of extracorporeal lung support. In spite of miniaturised techniques and a simpler handling, ECMO remains a technically and pathophysiologically highly complex treatment modality that has to be supported by multimodal therapeutic management and expertise of different medical specialties.

The challenges inherent to the procedure, as well as the possible life-threatening complications, can only be met in centers that ensure comprehensive logistical and structural conditions at any time of day or night, as the authors rightly comment. On this background and from the perspective of the authors – and in analogy to the treatment of other diseases – quality assurance measures for the treatment of severe ARDS by using extracorporeal lung support would be extremely welcome (3).

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High-Quality Logistical Concept for Interhospital Transport Is Crucial

In their interesting review article (1), Müller and coauthors described the use of pulmonary support procedures, such as extracorporeal membrane oxygenation (ECMO) in adult patients with acute respiratory distress syndrome (ARDS). The article is of enormous interest because it shows clearly the revival of the procedure in recent years and its importance today. We wish to focus on two issues that seemed to have received short shrift in the article.

Intensive transport of ECMO patients on the ground and in the air has gained in importance in recent years. The authors reported that from January 2006 to July 2012, a total of 266 patients were treated by using venovenous ECMO at Regensburg University Medical Center. It would have been interesting to know which proportion of these patients were cannulated in an external hospital and subsequently transported between hospitals (>100, as mentioned by the authors). It would also be interesting to know the type and frequency of transport-related complications since almost no valid data have been published in this context yet. A fundamental rule is that for ECMO implantation in a decentralized hospital and for the subsequent interhospital transport, a high-quality logistic concept using a small team with excellent technical expertise is crucial, as is regular training (2). This is the only way in which patients can transported successfully and at a high-quality level.

Furthermore, ECMO implantation has been an established therapeutic option for treating ARDS in neonates for almost 40 years. After an initial description in 1975 by R H Bartlett from California, ECMO was first used in a neonate in Germany in 1987 at Mannheim University Medical Center (3) and has since then become firmly established at least in pediatric intensive care. A short explanation of the particularities of ECMO treatment in pediatric patients would have been desirable.

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In Reply:

We thank PD Dr Muellenbach and coauthors for their additional comments, which once more emphasize one of the messages of our article.

It is beyond argument that the treatment of critically ill patients with severe pulmonary failure should be concentrated in centers because highly specialized management can further improve the chances of survival. Using extracorporeal pulmonary support is one of several therapeutic options in the context of the treatment and should, in our opinion, also be restricted to centers. In our article for *Deutsches Ärzteblatt* we tried to make that very point.

Potentially life-threatening complications need to be detected and managed as early as possible; this is possible only if staff are experienced and intensively trained, and if colleagues from other medical specialties are accessible, for example, vascular surgeons.

The main prerequisite for treating such patients in centers is a mobile ECMO team that can externally initiate extracorporeal support if required, in order to ensure safe transportation. PD Dr Hinkelbein and colleagues rightly emphasize that cannulating critically ill patients in external hospitals and their subsequent transportation on ECMO are not without risks. Smooth logistics, standardized procedures, and specialized teams are essential. The publication of our results and experiences with a total of 126 patients who were transported on venovenous ECMO is in preparation.

Extracorporeal procedures are used in neonates and children with respiratory or cardiac failure worldwide and in high volumes. The indication and the practical approach differ substantially from the treatment of adults. To explain this in greater detail would have exceeded the scope of our review article and was therefore explicitly not included.

Introducing quality assurance for the treatment of severe acute respiratory syndrome by using extracorporeal therapy, such as PD Dr Muellenbach mentioned, is well established in other countries and should be aimed for in Germany. A promising initiative is being prepared by the ARDS Network Germany, in order to establish therapeutic standards and thus further optimize the treatment of these seriously ill patients.

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