Perspective

Ethical Dilemma ECMO and COVID

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Since the beginning of the coronavirus disease 2019 (COVID-19) pandemic >5.5 million deaths have been reported;[1] however, the magnitude of its impact is much greater and runs far deeper. The unmeasurable effect on the global economy, the social implications, and the stress placed on an already fractured healthcare system have changed humanity forever.

In the intensive care unit (ICU), where many COVID-19 patients are treated for respiratory failure caused by acute respiratory distress syndrome (ARDS), we have only a few targeted therapies with minimal efficacy. Supportive care often is the best of what we can provide. These supportive therapies aim to maintain homeostasis as the disease runs its course. One extreme example is extracorporeal membrane oxygenation (ECMO). It is an extremely invasive therapy that diverts most of a patient's circulating volume through an external membrane that oxygenates the blood and removes carbon dioxide. Although lifesaving, ECMO does not combat COVID-19 directly. It merely buys time while the body and the lungs recover.

From previous studies on ARDS, it is known that patients who survive require mechanical ventilation for a mean of 21 days.[2] Lung recovery beyond this time frame is not predictable or well understood. Some patients progress to fibrosis rather than recovery, and this is generally held to be an irreversible sequela of ARDS. As such, in the absence of curative targeted therapies for this disease, patients' lives can be sustained but remain dependent on ECMO. Barring complications, ECMO has the theoretical capacity to keep patients alive indefinitely, despite markedly impaired lung function. In this sense, ECMO can serve to prolong patients' suffering as their likelihood of recovery declines with each passing day. This "bridge to nowhere" scenario has previously been reported in the literature; however, the frequency of such cases has undoubtedly increased exponentially in the context of the pandemic.

Although ECMO is associated with several life-threatening complications, it has the capability of providing total support for the lungs in respiratory failure. Families may even see their loved ones awake, interactive, and in rare cases, even walking. In these cases, families are further burdened with a sense of false hope as they are forced to reconcile this benign appearance with the overall poor prognosis.

Not only does ECMO therapy imprison patients within the walls of the ICU but there are also visitor restrictions that have been imposed during the pandemic that mandate that patients endure their misery and fear in isolation. Families struggle with feelings of helplessness as they are forced to share in the suffering from a distance. The total psychological impact of being critically ill on ECMO during this pandemic is truly difficult to fathom.

Our healthcare workers have been particularly vulnerable to the plights of this pandemic. Their burden is not simply daily exposure to disease and increased risk of developing COVID-19—it extends further to fear of spreading the virus to their families and the psychological exhaustion of working in difficult conditions. For the treating team, caring for a patient on ECMO who does not experience lung recovery is particularly distressing. These patients and their families spend several weeks in the ICU forming close attachments to those involved in their care. It remains the duty of the treating team to be honest and informative about a patient's condition and prognosis, but walking the tightrope between controlled optimism and realism is extremely challenging.

Finally, the financial and logistical implications of prolonged treatment with ECMO need to be considered. ECMO is extremely resource intensive, and the inappropriate use of this limited resource may cost another patient a chance at recovery. The Conventional Ventilatory Support versus Extracorporeal Membrane Oxygenation for Severe Adult Respiratory Failure (CESAR) trial, a randomized controlled trial evaluating the economic impact of ECMO, demonstrated that cost per patient in the ECMO group was twice that of the conventional group, and patients stayed in the hospital for an average of 35 days.[3] Beyond this, hospitals have only a limited capacity to run ECMO simultaneously for multiple patients. In the context of the current pandemic, during which there has been an increase in the number of patients eligible for ECMO, the allocation of ECMO becomes particularly challenging.

Our hope is to bring to light this growing ethical dilemma created by the increasing utilization of ECMO and the rapid increase in ARDS during the COVID-19 crisis.

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