MICH (4) 2022

Ethics Discussion Paper: Ethical Considerations for Withdrawal of VA-ECMO Support for Patients in Cardiogenic Shock if Prognosis is Poor

R. Randhawa[1]

[1] Michener Institute of Education at UHN, Toronto, ON, Canada

E-mail: 21rr4@michener.ca

Received 01/11/2022
Published 25/04/2022

Abstract

Extracorporeal Membrane Oxygenation (ECMO) is an advanced form of life support for individuals with critical illnesses affecting their heart and/or lungs. Some conditions in which ECMO may be considered include myocarditis, sepsis, cardiogenic shock, and respiratory failure. It can be used as a bridge to recovery, bridge to heart/lung transplant, bridge to ventricular assist device (VAD) transplantation for lengthier circulatory support, or bridge to decision therapy where prognosis is unclear but there is still a chance of recovery. With venoarterial ECMO (VA-ECMO), blood is drained from a vein into the ECMO circuit before entering an oxygenator where gas exchange occurs across a semi-permeable membrane. This oxygenated blood is then returned to the patient via an artery. VA-ECMO provides both respiratory and cardiac support by delivering adequate tissue perfusion. Individuals are typically supported by VA-ECMO for hours to weeks depending on the progression of the medical condition

Extracorporeal Membrane Oxygenation (ECMO) is an advanced form of life support for individuals with critical illnesses affecting their heart and/or lungs. Some conditions in which ECMO may be considered include myocarditis, sepsis, cardiogenic shock, and respiratory failure (Makdisi et al., 2015). It can be used as a bridge to recovery, bridge to heart/lung transplant, bridge to ventricular assist device (VAD) transplantation for lengthier circulatory support, or bridge to decision therapy where prognosis is unclear but there is still a chance of recovery (Makdisi et al., 2015). With venoarterial ECMO (VA-ECMO), blood is drained from a vein into the ECMO circuit before entering an oxygenator where gas exchange occurs across a semi-permeable membrane. This oxygenated blood is then returned to the patient via an artery. VA-ECMO provides both respiratory and cardiac support by delivering adequate tissue perfusion. Individuals are typically supported by VA-ECMO for hours to weeks depending on the progression of the medical condition (Makdisi et al., 2015).

The outcomes and success rates of patients on VA-ECMO for cardiogenic shock vary based on the etiology of the disease, but overall, it has been reported that there is a 40% survival rate (Godfrey et al., 2021). In a recent retrospective study that examined the records of patients with cardiogenic shock that were on VA-ECMO between 2011-2017, the lowest success rates were reported for post cardiotomy shock (29% chance of survival) and sepsis (0% chance of survival) (Amin et al., 2021). The decision to withdraw from VA-ECMO when the prognosis is poor can be extremely difficult emotionally and ethically, so it is important that this therapy be initiated on patients with a high probability of weaning from it successfully.

When the treatment is no longer medically effective and the prognosis is poor, the physician may

propose to withdraw the patient from treatment. The Health Care Consent Act (HCCA) aims to maintain patient autonomy and states that a physician requires consent from the patient to administer a treatment (Chidwick et al., 2013). If the patient is incapable, the decision is made by a substitute decision maker (SDM). The Act does not directly state that consent is required for a physician to withdraw life support. However, in 2013, the Supreme Court of Canada ruled that under the HCCA, the physician does in fact require verbal or written consent before withdrawing treatment (Downar et al., 2014). If the physician believes that withdrawal is in the best interest of the patient but the SDM disagrees, the Consent and Capacity Board (CCB) is approached for guidance (Chidwick et al., 2013).

The ethical problems in these circumstances where there is a disagreement between SDM and physician in end-of-life matters include questions of autonomy vs beneficence and nonmaleficence, concerns around where the locus of decision-marking should reside (physician or SDM), prognostic accuracy based on differences in opinion regarding the uncertain concept of medical futility, and concerns about the possible waste of scarce medical resources. An important question to dwell on is who should make the ultimate decision of withdrawing a patient from ECMO when prognosis is poor? My belief is that physicians should be able to withdraw treatment without SDM consent when there is obvious poor prognosis and medical futility. Choosing to consent to withdrawal of treatment for a loved one can be burdensome and overwhelming. Some of that may be relieved if that decision is made for you by the physician who is more knowledgeable about the complexities of the case. Futile prolonging of a patient's suffering also causes internal conflict for the healthcare workers caring for the patient. Furthermore, there could be other patients with better prognosis that would greatly benefit from the equipment that is only prolonging suffering for the patient with poor prognosis.

In 2021, a 52-year-old male living in England with initials KM suffered from a cardiac arrest caused by a pulmonary embolism (Dyer et al., 2021). With hopes of recovery, KM was placed on VA-ECMO as a bridge to decision. The day after he was placed on ECMO, KM was diagnosed with COVID-19 which augmented the destruction of his lungs. Unfortunately, his condition deteriorated over the course of three months to the point where the physicians deemed his condition irreversible, and that further treatment was futile and difficult for the patient. He had lost a great amount of muscle, lost twenty kilograms, had painful necrosis in his fingers and toes, and pressure sores on his perineum and ear. The pressure sore on his ear penetrated his skull and was a source of terrible pain which was evident to the physicians and nurses from KM grimacing. Though he was sedated, he was still conscious and aware of pain. The physicians attempted to wean him off ECMO eight times over two months but all attempts were unsuccessful. The nurses that treated KM reported feeling distress watching KM suffer despite their best efforts to alleviate the pain.

Since KM was not in a condition to consent to treatment or withdrawal of treatment, his wife was responsible for making decisions on his behalf. The physician caring for KM proposed to withdraw him from ECMO due to the poor prognosis, but KM's wife, son, and brother-in-law strongly opposed. KM and his family were deeply religious and belonged to the Christian faith. His family believed in divine healing and that God could intervene and cure KM. They were not willing to accept the physician's recommendation to remove KM from ECMO. An application was filed by the healthcare workers to receive legal permission from the court to end his treatment. KM's family presented to the judge that KM was a very religious man and would have wished to continue being on life support, even if that meant he would continue to suffer. Several doctors presented evidence that KM's lungs had stopped working and his condition was irreversible. They also mentioned that KM's condition can be causing him a lot of pain and suffering. With overwhelming evidence supporting the discontinuation of ECMO, the judge responsible for overseeing this case ruled that it was appropriate to remove KM from life support.

One of the principles of bioethics that relates to this case study is the principle of beneficence. This principle states that a physician is obligated to act for

the benefit of the patient and must avoid doing harm or remove conditions that cause harm (Williams et al., 2016). In this case, further treatment is clearly deteriorating KM's condition and causing him further harm. It would be in his best interest to be withdrawn from ECMO to prevent suffering. A related principle is the principle of non-maleficence which states that a physician should not perform any actions that will harm the patient (Williams et al., 2016). Patient prognosis and quality of life need to be carefully considered by physicians before making the decision to withdraw life support. In the case of poor prognosis and poor quality of life, such as in KM's case, the physician would actually be causing further harm by keeping him on life support. By withdrawing KM from ECMO, the physician would be relieving his suffering and acting in KM's best interest.

Another principle of bioethics related to this case is the principle of justice which refers to fair and equal treatment of all patients (Williams et al., 2016). Distributive justice is a term that specifically refers to the fair distribution of healthcare resources (Williams et al., 2016). The ECMO machine that KM is using as life support could be beneficial to another patient who has a much better prognosis. It is pointless to keep KM on life support knowing that it is not doing anything to benefit his condition and is only prolonging his suffering and death.

The bioethical principle of autonomy is one that causes conflict with this particular case, and in my opinion, should be overriden. This principle shifts the point of authority from physician to the patient/SDM and asserts that you must respect the wishes of the patient/SDM to accept, refuse, or withdraw treatment (Williams et al., 2016). It becomes difficult to make these decisions when the patient is unable to participate in discussions, because we do not know for sure what the patient themselves would want. The SDM wishes for the treatment to continue, but the patient is increasingly suffering the longer he remains on life support. There is a clear conflict between the principle of autonomy and the principles of beneficence and non-maleficence in this case, creating tension between the healthcare team and the family. Palliative care and ethics consultations may be very valuable in these situations to provide support and clarify medical decisions to the family.

As demonstrated by this case, it is extremely challenging emotionally and ethically for everyone involved to make the decision to withdraw a patient from ECMO, and even harder when there are conflicting opinions. In a survey completed by 179 physicians, 56% of participants agreed that physicians should be able to withdraw a patient from ECMO despite SDM objection if they believe it is the right thing to do (Meltzer et al., 2016). One of the reasons I believe physicians should be the ultimate decisional authorities in cases where the patient's condition is futile is because it may relieve some of the moral distress that is associated with making the decision to withdraw a loved one from ECMO. Also, the families of patients most often do not have enough medical knowledge to understand the complexity of the condition and treatment to make a truly informed decision. It is important for physicians and other members of the healthcare team to educate these members and explain why the decision to withdraw the patient from ECMO was in the patient's best interest. However, considering the complex nature of the treatment and patient condition, this information may be incredibly difficult to grasp for the layperson.

As mentioned earlier, the nurses and healthcare workers that were providing care for KM were clearly distressed watching him suffer and deteriorate. Knowing that there is futile prolonging of a patient's suffering causes internal conflict and discomfort for the healthcare workers caring for the patient. In a survey completed by nurses in 2013, "following family's wishes to continue life support when not in patient's best interest" was rated as one of the most intense morally distressing circumstances (Browning et al., 2013). Caring for patients with poor prognosis who are on ECMO and clearly suffering from it can lead to staff burnout and dissatisfaction.

Despite believing that physicians should have the ultimate decisional authority, I do understand why families put such a great weight on hope and belief. There are several instances in the past where a physician's prognosis has been incorrect. For example,

in 2009, Kaylee Vitelli was born with Joubert Syndrome and was placed on life support at the Hospital for Sick Children in Toronto ("Baby Kaylee," 2009). The physician caring for Kaylee believed that she would not survive once removed from life support, so a decision was made to transplant her heart into another ill baby at the hospital. After life support was withdrawn, Kaylee continued to breath and survived. In addition to belief in divine intervention, SDM's might doubt the accuracy of physician's prognosis after hearing about cases like these, where the patient continued to survive despite a very poor prognosis from physicians. In a study conducted to understand SDM's beliefs about physicians' prognoses for critically ill patients, a surprising 88% of participants expressed doubt in the physician's prognosis (Zier et al., 2008). One of the reasons for this doubt was due to prior experience with incorrect prognostications.

As of right now in Ontario, physicians must approach the Consent and Capacity Board for guidance in cases where there is disagreement between clinicians and SDM's about withdrawal of treatment. I believe the final decision to withdraw treatment should be of the physician after all the approaches to recover the patient have been explored. They are the most knowledgeable about the case and the risks/benefits associated with continuing treatment. By making the ultimate decision, it would lessen the decisional burden on the SDM and the internal conflict for the medical staff that feels discomfort caring for a patient who is clearly suffering with an irreversible condition. Furthermore, the equipment being used for this futile case could be put to better use for a patient with a better prognosis. A way to reduce the moral burden on the SDM and have their decision align better with the physicians is to work on bettering the transfer of knowledge from physicians to the SDMs and family. Misunderstandings and incomplete information make informed consent difficult because they are not fully aware of the benefits and risks of the treatment. It should be made a priority to explain to the family that the potential for complications and suffering outweigh the benefits being provided by the therapy. It should also be made a common practice to have ethical consults as soon as it is appropriate so that treatment goals can be clarified. In closing, I believe it is in the best interest of the patient if the ultimate decision to withdraw them from VA-ECMO is made by a physician who has balanced all the ethical considerations.

References

Amin, F., Lombardi, J., Alhussein, M., Posada, J. D., Suszko, A., Koo, M., ... & Billia, F. (2021). Predicting survival after VA-ECMO for refractory cardiogenic shock: validating the SAVE score. CJC open, 3(1), 71-81.

Baby Kaylee to be discharged from Sick Kids. (2009, May 12). Toronto. https://toronto.ctvnews.ca/baby-kaylee-to-be-discharged-from-sick-kids-1.397994

Browning, A. M. (2013). CNE article: Moral distress and psychological empowerment in critical care nurses caring for adults at end of life. American Journal of Critical Care, 22(2), 143-151.

Chidwick, P., Sibbald, R., & Hawryluck, L. (2013). Best interests at end of life: an updated review of decisions made by the Consent and Capacity Board of Ontario. Journal of critical care, 28(1), 22–27. https://doi.org/10.1016/j.jcrc.2012.09.005

Downar, J., Sibbald, R. W., Bailey, T. M., & Kavanagh, B. P. (2014). Withholding and withdrawing treatment in Canada: implications of the Supreme Court of Canada's decision in the Rasouli case. CMAJ, 186(16), E622-E626.

Dyer, C. (2021). Covid-19: Judge gives permission for NHS trust to remove life support from patient.

Godfrey, S., Sahoo, A., Sanchez, J., Fried, J., Masoumi, A., Brodie, D., ... & Nakagawa, S. (2021). The role of palliative care in withdrawal of venoarterial extracorporeal membrane oxygenation for cardiogenic shock. Journal of Pain and Symptom Management, 61(6), 1139-1146.

Makdisi, G., & Wang, I. W. (2015). Extra Corporeal Membrane Oxygenation (ECMO) review of a lifesaving technology. Journal of thoracic disease, 7(7), E166.

Meltzer, E. C., Ivascu, N. S., Stark, M., Orfanos, A. V., Acres, C. A., Christos, P. J., Mangione, T., & Fins, J. J. (2016). A Survey of Physicians' Attitudes toward Decision-Making Authority for Initiating and Withdrawing VA-ECMO: Results and Ethical Implications for Shared Decision Making. The Journal of clinical ethics, 27(4), 281–289.

Williams, S. B., & Dahnke, M. D. (2016). Clarification and mitigation of ethical problems surrounding withdrawal of extracorporeal membrane oxygenation. Critical care nurse, 36(5), 56-65.

Zier, L. S., Burack, J. H., Micco, G., Chipman, A. K., Frank, J. A., Luce, J. M., & White, D. B. (2008). Doubt and belief in physicians' ability to prognosticate during critical illness: the perspective of surrogate decision makers. Critical care medicine, 36(8), 2341–2347.