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EC CARDIOLOGY
Perspective

ECMO? It is Useful as a Tool for CO2 Expulsion and Mechanical Ventilation with Low Tidal Volume Vs Conventional Mechanical Ventilation to Avoid Lung Injury of Tracheostomy?

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Introduction

The extracorporeal circulation system was written in 1953 by Gibson, in 1965, the oxygenation membrane appeared in 1972, Hill and collaborators managed to apply an artificial system of oxygenation of the blood extra body for a prolonged period of time. In 1975 Bartlett managed to survive the first neonatal. Patient thanks to the use of ECMO.

It is a life support machine in patients with heart and lung failure, it replaces the function of the heart and lung. These patients are in critical care, and it is used for a few hours or for several days depending on the progression of their condition. Pediatric use is well documented in post-operative congenital heart disease and in heart transplantation as a previous bridge, in patients with severe cardiac damage secondary to massive myocardial infarction, refractory shock and patients with covid 19 with severe CO_2 entrapment lung damage and in mechanical ventilation protocol combined with decreased tidal volume to decrease lung injury. ECMO is used through plastic cannulas in veins, arteries, legs, neck, and thorax. The ECMO machine pumps blood from the patient's body to a lung. artificial or oxygenator that adds oxygen and removes CO_2. The ECM machine sends blood from the patient's body with the strength of a heart replacing its function. This machine is operated by a technician called perfusionist with advanced training. ECM monitoring is through pressure, heart rate, gas, oxygen and CO_2 monitors. The patient must be anticoagulated and sedated. L as is an extracorporeal assistance with membrane oxygenation, it is a cardiac and pulmonary support system used in patients unable to maintain adequate tissue oxygenation and perfusion. There are three types of ECMO venous arterial cannulation used for cardiac assistance and may be appropriate for respiratory assistance. Venous does not provide hemodynamic support is preferred for respiratory support. Arteriovenous specifically to remove CO_2. A scheme should be considered when the risk of mortality is 50% or greater in respiratory failure and is indicated when the risk is greater than 80%. A PaO_2/FiO_2 less than 150 with FiO_2 greater than 90 percent and or mortality 50%. Mortality of 80% with a patient with PaO_2/FiO_2 less than 80 and a FiO_2 greater than 90 percent Murray scale 3 - 4. Respiratory failure is done According to the Murray Score scale 2 - 3 mortality of 50% Murray greater than three 80% mortality. It is common to observe a patient with respiratory difficulty due to covid, bilateral pulmonary infiltrate, a frosted glass suggestive chest tomography image, and PaO_2/FiO_2 of less than 100 in patients requiring ECMO. In the H1N influenza pandemic, one became the need for this type of technology was evident in patients who developed adult respiratory distress syndrome. In the covid pandemic, there are precise indications for its use in combination with mechanical ventilation. There is the

technique of vascular access with percutaneous cannulation of the femoral veins, right internal jugular vein, femoral arteries, and the use of ultrasound and the fluoroscope allows the proper position of the cannulas to be verified. Made of poly methyl pentene. The console is in charge of the hemodynamic control of the system, supplies the driving force to the blood pump and regulates the operation and translates the information from the hemodynamic sensors implanted in the circuit. The centrifugal pump is a device provided with magnetic blades or cones that when it rotates, a centrifugal force is generated, causing a negative suction pressure at the pump inlet and a positive pressure at the outlet, generating the flow. The respiratory objectives to be achieved with this device are arterial oxygen saturation greater than 95 in the arterial venous ECMO, in the venous ECMO 85 - 92 percent. Blood pressure of oxygen greater than 60 mmHg, a PaO_2/FiO_2 greater than 200, $PaCO_2$ 35 - 45 mmhg, pH: 7.35 - 7.4. Recently with the advent of new technologies for ECMO 15 F, 18 F novaton cannulas appear, novaport twin, avalon bicaval and new centrifugal pumps called magnetic levitation centrifugal pump. There are different blood pumps for ECMO roller, axial, diagonal, rotaflow, medos dp3, sorin revolution, biopump from medtronic. In the supernova trial study 95 patients were described in which ultraprotective ventilation and ECMO were used. an international prospective multicenter phase two study. Results are that the ECMO facilitates protective ventilation, and the extraction of mild and high CO_2. ElEstudio x travent with 300 patients with a PaO_2/FiO_2 less than 200 and a reduction in plateau pressures that are trans pressures was evidenced. with decreased CO_2 and pH control. In conclusion we believe that ultra-protective mechanical ventilation combined with ECMO is a useful technique as an adjunct in patients with severe respiratory distress syndrome due to Covid. We know that mechanical ventilation can produce lung injury and inactivity of the diaphragm as well as requires sedation. There is a term that removing CO_2 from the lung with this device is called respiratory dialysis. Gatinoni was the first to point out the low frequency of the positive ventilatory pressure combined with the extracorporeal circulation with how in respiratory failure. He described that the carbon dioxide removed with that of how it is from 500 to 1000 cc with hemodialysis from 200 to 360 and with oxygenation is corporeal from 2000 to 4000 cc. Protective mechanical ventilation combined with ECMO is superior to conventional mechanical ventilation in covid 19. Respiratory failure according to the Berlin criteria and definition is mild, moderate and severe. In moderate and severe ultra-protective ventilation is required and below a PaO_2/FiO_2 less than 100, a combination of strategies is required with the ECMO of tracheostomy, we need to keep in mind that CO_2 is the lactate of the lungs [1-6].

Ethical Responsibilities

The authors declare that they have no conflicts of interest when writing the manuscript.

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