Session PO2-AN-CC - POSTER SESSION 2: Anesthesiology and Critical Care (Non-CME)

0717 / Board #144 - Ex Vivo Lung Perfusion (EVLP): An Algorithm Proposal to Identify Acceptable Organs for Transplantation

April 11, 2024, 4:30 PM - 5:30 PM | Poster Hall

Topic:
LUNG -> LUNG-Clinical Ex-Vivo Perfusion and Preservation

Presenter
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Disclosures
C.Magri: None. **F.Madotto:** n/a. **A.Palleschi:** None. **L.Rosso:** None. **F.Valenza:** n/a. **G.Grasselli:** n/a. **A.Zanella:** n/a.

Abstract or Presentation Description
Purpose Due to organ shortage, EVLP has been *increasingly* used to assess extended-criteria donor lung and expand donor pool. Different protocols are used worldwide to perform the procedure; however, organ acceptance criteria, although mainly evaluating the ratio between arterial oxygen partial pressure and inspiratory fraction of oxygen (PaO_2/FiO_2), are still not clearly defined. We propose a decision-making algorithm to help grafts assessment
Methods This is a monocentric, retrospective observational study on data from donors and EVLP performed at Fondazione I.R.C.C.S. Ca' Granda Ospedale Maggiore Policlinico, Milan (March 2011 September 2023). EVLP was performed using an open atrium technique with cellular perfusate. Lung mechanics and gas exchange were longitudinally collected during EVLP and compared between accepted and declined organ. To predict acceptance of organ, for each parameter we detected the optimal cut-off value according to ROC curve analysis. Multiple series tests were used to identify the algorithm with the highest sensitivity and specificity. A Negative Binomial Regression Modeling was used to investigate association between physiological variables and organ recipient's duration of mechanical ventilation (MV).
Results Sixty-five EVLPs were included. Transplantation rate was 69.2%. At 60 minutes after EVLP's beginning only static compliance based on ideal body weight (IBW), was different between accepted and declined organs ($p<0.05$). At final evaluation also PaO_2/FiO_2 ($p<0.05$) and pulmonary vascular resistance (PVR) ($p<0.05$) differed. PVR was strongly correlated with recipient's duration of MV ($p<0.05$). A decision-making algorithm was created using three parameters: PaO_2/FiO_2, compliance and the presence/absence of secretions or plasmorrhea. The algorithm achieved a sensitivity of 91% and specificity of 95% (AUC: 0.81, [95% CI:0.72-1.00]) and its application showed a lower recipient's duration of MV in patients who received lungs identified as acceptable (4 [2.75-21.50] vs 1[2-6.25] days, p= 0.25).
Conclusion The proposed algorithm, based on PaO_2/FiO_2, presence/absence of major secretions or plasmorrhea and compliance could help to standardize lung grafts assessment.