

Reliability of thermodilution cardiac output (CO) measurement in femoro-femoral veno-venous ECMO (VV-ECMO)

Dott.ssa ELENA SPINELLI (1), Dott.ssa STEFANIA CROTTI (1), Dott. NICOLA BOTTINO (1), Dott.ssa ELISA CIPRIANI (2), Dott.ssa ELEONORA SCOTTI (2), Prof. GIACOMO GRASSELLI (2), Prof. ANTONIO PESENTI (2)

(1) IRCCS Ca' Granda Ospedale Maggiore Policlinico di Milano, Via F. Sforza, Milano, Italia.

(2) Università degli Studi di Milano, Via Festa del perdono, Milano, Italia.

Argomento: Altro

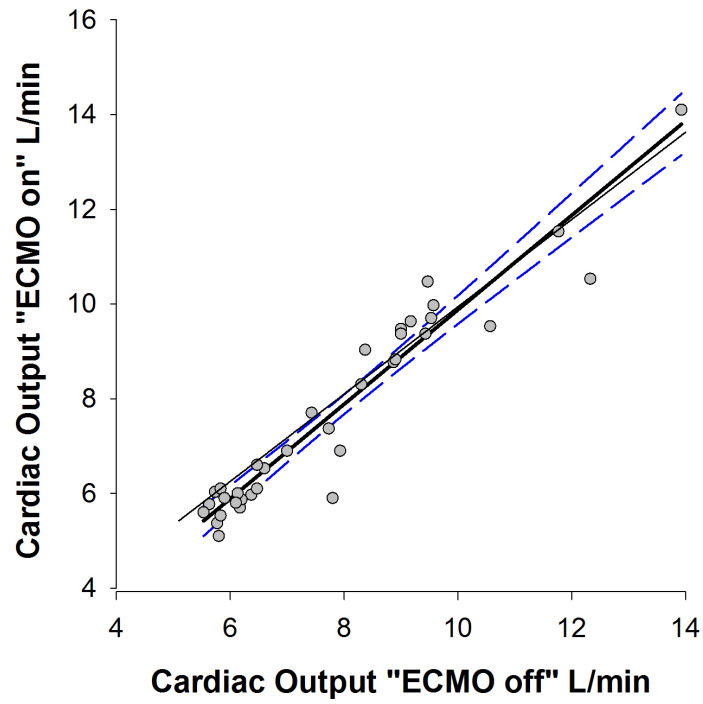
Introduction/Aim: Cardiac Output (CO) measurement is crucial in the management of patients undergoing VV-ECMO for respiratory failure: CO is a determinant of oxygen delivery and the ratio between ECMO blood flow (BF) and CO affects the level of support. Thermodilution CO during ECMO may give overestimated results caused by indicator loss into the extracorporeal circuit, but this effect likely depends on drainage cannula position. We hypothesized that thermodilution is reliable during VV-ECMO when drainage cannula is not close to the right atrium.

Methods: Thirteen patients on femoro-femoral VV-ECMO were studied during cardiorespiratory stability before planned ECMO removal. Cannula positions in the inferior vena cava were radiographically checked, with the tip of the drainage cannula (21-25 French) at the level of L1-L2 and the reinfusion cannula (19-23 French) at T10-T11. Standard thermodilution CO determinations were obtained in triplicates by injections of saline through the atrial port of pulmonary artery catheter, during clamped system ("ECMO-off") and after re-opening the circuit ("ECMO-on"), at three different level of BF (1.5-3-4.5 L/min). Association and agreement between "ECMO-off" and "ECMO-on" measurements were assessed by linear regression and Bland-Altman analysis.

Results: CO measurements (range 5.1-14.1 L/min) performed during "ECMO-off" and "ECMO-on" disclosed highly significant correlation ($R^2 = 0.92$, $p < 0.0001$) [Fig.1A]. Bland-Altman analysis revealed mean difference of -0.1 ± 0.6 L/min and limits of agreement between -1.3 and 1.1 L/min (-17-13%) [Fig.1B].

Conclusion: In this specific configuration of VV-ECMO thermodilution CO measurements are not affected by the extracorporeal circulation.

1A



1B

