The incidence of cannula-related venous thrombosis after venovenous extracorporeal membrane oxygenation is high” Fisser et al (2019).

Abstract:

Objectives: Venovenous extracorporeal membrane oxygenation is indicated in patients with severe refractory acute respiratory failure. Venous thrombosis due to indwelling catheters is a frequent complication. The aim of this study was to analyze the incidence of cannula-related thrombosis and its risk factors after venovenous extracorporeal membrane oxygenation.

Design: Retrospective observational study.

Setting: A medical ICU at the University Hospital Regensburg.

Patients: We analyzed consecutive patients with severe respiratory failure (PaO2/FIO2 < 85 mm Hg and/or respiratory acidosis with pH < 7.25) who were successfully treated with venovenous extracorporeal membrane oxygenation in a medical ICU between 2010 and 2017. Intervention: None. Measurements and Main Results: After extracorporeal membrane oxygenation weaning, duplex sonography or CT was conducted to detect cannula-related thrombosis. Thrombosis was classified as a large thrombosis by vein occlusion of greater than 50%. The incidence of thrombosis was correlated with risk factors such as coagulation variables (mean activated partial thromboplastin time ≤ 50 s, international normalized ratio antithrombin III, fibrinogen, plasma-free hemoglobin, platelets, and decline in D-dimer ≤ 50% the day after decannulation), cannula size, time on venovenous extracorporeal membrane oxygenation, renal failure, and underlying malignant disease. Data cut-off points were identified by receiver operating characteristic analysis. One-hundred seventy-two of 197 patients (87%) were screened. One-hundred six patients (62%) showed thrombosis that was considered large in 48 of 172 (28%). The incidence of thrombosis was higher in patients with a mean aPTT of less than or equal to 50 seconds (odds ratio, 1.02; p = 0.013) and in patients with a decline in D-dimer less than or equal to 50% (odds ratio, 2.76; p = 0.041) the day after decannulation following adjustment for risk factors. Conclusions: The incidence of cannula-related venous thrombosis after venovenous extracorporeal membrane oxygenation is high. Reduced systemic anticoagulation may enhance the risk of thrombosis. Sustained elevation of D-dimer after decannulation may indicate thrombosis. Patients should undergo routine duplex sonography after extracorporeal membrane oxygenation to detect
thrombosis formation in the cannulated vessel.

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