P1687 THROMBOEMBOLISM IN COVID-19 PATIENTS ON ECMO

Topic: 34. Thrombosis and vascular biology - Biology & Translational Research

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Background: Venous thromboembolism (VTE) is a common complication of COVID-19 (coronavirus disease 2019), which often leads to sudden deterioration and death. There are multiple mechanisms contributing to this phenomenon. Endothelial injury from COVID-19 triggers platelet activation and adhesion, leukocyte aggregation, cytokine storm and complement activation. Cytokine storm triggers coagulation activation and thrombin generation. Complement activation is also thought to trigger the formation of systemic thrombus through recruiting inflammatory cytokines and possible complement-mediated thrombotic microangiopathy.

Patients on extracorporeal membrane oxygenation (ECMO) are at risk of developing thromboembolism. Thrombus formation within the extracorporeal circuit is the main reason for systemic thromboembolism. Possibly that by contacting blood and nonendothelial surfaces, ECMO triggers activation of coagulation pathway and inflammatory response.

Aims: Thromboembolic prophylaxis is critical in managing COVID-19 patients on ECMO. Anticoagulation is recommended to all hospitalized COVID-19 patients unless there are contraindications. However, patients are still found to develop VTE while on anticoagulation and the prevalence of VTE in COVID-19 patients on ECMO is still unclear. We aim to investigate the VTE incidence and contribute to anticoagulation strategy and management in this specific population.

Methods: We retrospectively reviewed the data of 23 patients who were diagnosed with COVID-19 and managed with ECMO. All patients received thromboembolic prophylaxis since admission. We report our findings of the incidences of thromboembolism.

Results: Twenty-three adult patients who were diagnosed with COVID-19 received ECMO support. Sixteen patients were minorities, and seven patients were Caucasians. The mean age of patients was 44.8-year-old. Seventeen patients were males, and eleven patients had at least one of the following pre-ECMO comorbidity: ten (43.5%) patients had hypertension, eleven (47.8%) patients had type 2 diabetes and four (17.3%) patients had hyperlipidemia. None of the patients were active smokers or had chronic lung disease.

During the hospital course, all patients received heparin for thromboembolic prophylaxis. The overall VTE rate was 34.7%. Six patients developed deep vein thrombosis (DVT) (26%) with lower extremities induration. Two patients were found to have pulmonary embolism (PE) (8.7%). Four patients had clotted circuit that requiring exchange. No stroke or myocardial infarction (MI) was diagnosed in these patients. Heparin-induced thrombocytopenia (HIT) was excluded in all cases.
Summary/Conclusion: Based on our study, the overall VTE rate of COVID-19 patients on ECMO was 34.7% with 26% incidence of DVT and 8.7% incidence of PE. According to Jenner’s recent systemic review of 28 studies, 34% of 2928 ICU-managed COVID-19 patients developed VTE. PE was found in 12.6% of patients and DVT was detected in 16.1% of patients. 529 patients (18.0%) received ECMO in the cohort. When compared to our study, there were no statistically significant differences of the incidences of VTE, DVT or PE between these two studies, although all our patients were on ECMO support. Further investigation into the prevalence, implications, and management of thromboembolism in COVID-19 patients on ECMO will lead to significantly improved outcomes for this specific patient population.