

Platelet prothrombotic activity as a predictor of clinical outcomes in COVID-19 patients

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Background

COVID-19 is associated with high risk of thromboembolic events. Platelet prothrombotic activity in patients with COVID-19 is poorly characterized. We aimed at evaluating the platelet prothrombotic activity in COVID-19 patients at the initial stage of the disease and correlating patient-specific platelet prothrombotic profile with clinical outcomes.

Methods

Sixteen patients admitted to the emergency department of the IRCCS San Raffaele Scientific Institute (Milano, Italy) between February and April 2021 were enrolled. All patients presented with respiratory symptoms and tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Platelet prothrombotic activity was measured using the modified-prothrombinase Platelet Activity State (PAS) assay. The test was performed within 24 hours from patients' hospital admission. Data were compared with those measured in n=24 healthy volunteers (controls).

Results

Platelet prothrombotic activity was significantly higher in COVID-19 patients with respect to controls (PAS = 0.63 [0.58-0.98]% vs. 0.46 [0.40-0.65]%, respectively; p=0.03). Moreover, highest PAS values were measured in the two patients who had the worst clinical outcome (i.e., death because of respiratory failure in one patient, and longest in-hospital stay because of severe worsening of respiratory symptoms in the other patient; PAS = 2.09% and 1.20%, respectively).

Conclusions

Our study suggests that platelet prothrombotic activity might predict poor clinical outcomes of COVID-19. Accordingly, targeting platelet prothrombotic activity at an early stage of the disease might contribute to improve clinical outcomes of hospitalized patients. Future studies evaluating the efficacy and safety of antiplatelet therapy in selected COVID-19 patients with early severe prothrombotic activity are warranted.

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