

August 2020

COVID-19 and coagulopathy

Recent research has indicated that thrombotic complications are one of the many diverse complications attributed to COVID-19. Months into the pandemic, there is now a growing body of evidence to support the theory that the novel coronavirus can infect blood vessels, which could explain the high prevalence of blood clots, strokes, heart attacks, and organ failures.¹

What are the COVID-19 related thrombotic indicators?

The most common pattern of coagulopathy observed in patients hospitalized with COVID-19 is characterized by elevations in fibrinogen and D-dimer levels (>1000 ng/mL at admission and rapidly rising). This correlates with a parallel rise in markers of inflammation (eg, C-reactive protein). Most patients will not demonstrate a prolongation of prothrombin time (PT) and/or activated partial thromboplastin time (aPTT) and thrombocytopenia is mild (platelet count ~120 x10⁹/L).^{2,3}

Patients with severe infection may meet the criteria for overt disseminated intravascular coagulation (DIC) criteria of the International Society on Thrombosis and Haemostasis. The coagulation parameters in COVID-19 DIC are reflected in the table below.⁴

Parameter	COVID-19 DIC
Platelet count	Normal or reduced
PT	Normal or prolonged
aPTT	Normal or prolonged
Thrombin time	Normal or prolonged
Fibrinogen	Elevated
Factor VIII	Elevated
Fibrin degradation products	Elevated
D-dimer	Elevated

Lupus-like inhibitors have been reported in some patients with COVID-19 as the reason for aPTT prolongation.⁵ Generally lupus anticoagulants are not associated with bleeding unless they are masking an underlying bleeding tendency or have associated hypoprothrombinemia in which case the PT will be prolonged. The artifactual aPTT prolongation may necessitate monitoring of unfractionated heparin with anti-Xa activity.⁵

Prognosis

Patients with serious infection are more likely to have COVID-19–associated coagulopathy than patients with mild infection, and those who die from COVID-19 are more likely to have met the criteria for DIC compared to survivors. Elevated D-dimer at admission and markedly increasing D-dimer levels (3- to 4-fold) over time are associated with high mortality, likely reflecting coagulation activation from infection/sepsis, cytokine storm, and impending organ failure.⁴

In patients with COVID-19-associated coagulopathy, what lab parameters should be followed?

Monitoring platelet count, PT/aPTT, D-dimer, and fibrinogen is recommended, and continued monitoring of patients post discharge is recommended for patients on extended prophylaxis.⁶

For more information on COVID-19, please visit [QuestDiagnostics.com/COVID19](https://www.questdiagnostics.com/COVID19)

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