AMERICAN COLLEGE of CARDIOLOGY

COVID-19 and Thrombotic or Thromboembolic Disease

Jun 08, 2020 | **Debabrata Mukherjee, MD, FACC**

Authors:	Bikdeli B, Madhavan MV, Jimenez D, et al., on behalf of the Global COVID-19 Thrombosis Collaborative Group.
Citation:	**COVID-19 and Thrombotic or Thromboembolic Disease: Implications for Prevention, Antithrombotic Therapy, and Follow-Up: *JACC* State-of-the-Art Review. *J Am Coll Cardiol* 2020;75:2950-2973.**

The following are key points to remember from this state-of-the-art review on COVID-19 and thrombotic or thromboembolic disease:

1. Coronavirus disease 2019 (COVID-19) may predispose patients to thrombotic disease, both in the venous and arterial circulations, due to excessive inflammation, platelet activation, endothelial dysfunction, and stasis.
2. Furthermore, many patients receiving antithrombotic therapy for thrombotic disease may develop COVID-19, which can have implications for choice, dosing, and laboratory monitoring of antithrombotic therapy. Drug-drug interactions between antiplatelet agents and anticoagulants with investigational COVID-19 therapies should be considered. It is paramount to consider how to optimize the available technology to care for patients without COVID-19 who have thrombotic disease.
3. There is no known risk of developing severe COVID-19 due to taking antithrombotic agents (i.e., antiplatelet agents or anticoagulants). If patients

have been taking antithrombotic agents for prior known thrombotic disease, they should continue their antithrombotic agents as recommended.

4. For outpatients on vitamin K antagonists who do not have recent stable international normalized ratios (INRs), and are unable to undergo home or drive-through INR testing, it is reasonable to transition the treatment to direct oral anticoagulants (DOACs) if there are no contraindications and no problems with drug availability and affordability. If DOACs are not approved or available, low molecular weight heparin can be considered as an alternative.
5. For hospitalized patients with COVID-19 and not in disseminated intravascular coagulation (DIC), prophylactic doses of anticoagulation can be administered to prevent venous thromboembolism. If pharmacological prophylaxis is contraindicated, it is reasonable to consider intermittent pneumatic compression.
6. For patients with moderate or severe COVID-19 on chronic therapeutic anticoagulation, who develop suspected or confirmed DIC without overt bleeding, it is reasonable to consider the indication for anticoagulation and weigh it with the risk of bleeding when making clinical decisions regarding dose adjustments or discontinuation. The majority of authors of this manuscript recommended reducing the intensity of anticoagulation in this clinical circumstance, unless the risk of thrombosis is exceedingly high.
7. For patients with moderate or severe COVID-19 and an indication for dual antiplatelet therapy (e.g., percutaneous coronary intervention [PCI] within the past 3 months or recent myocardial infarction [MI]) and with suspected or confirmed DIC without overt bleeding, in the absence of evidence, decisions for antiplatelet therapy need to be individualized. In general, it is reasonable to continue dual antiplatelet therapy if platelet count is ≥50,000, reduce to single antiplatelet therapy if platelet count is ≥25,000 and <50,000, and discontinue if platelets are <25,000. However, these guidelines may be revised upward or downward depending on the individualized relative risk of thrombotic complications versus bleeding.
8. For presentations concerning for STEMI and COVID-19, clinicians should weigh the risks and severity of ST-segment elevation MI (STEMI) presentation with that of potential COVID-19 severity in the patient, as well as risk of COVID-19 to the individual clinicians and to the health care system at large. Decisions for primary PCI or fibrinolytic therapy should be informed by this assessment.

9. To minimize risks associated with health care worker and patient in-person interactions, follow-up with e-visits and telemedicine is preferable in most cases.
10. There is a need for funding agencies, professional societies, patients, clinicians, and investigators to work together and address numerous critical areas of knowledge gaps regarding COVID-19 and thrombotic disease.

Clinical Topics: **Acute Coronary Syndromes, Anticoagulation Management, Invasive Cardiovascular Angiography and Intervention, Prevention, Pulmonary Hypertension and Venous Thromboembolism, Vascular Medicine, Anticoagulation Management and ACS, Anticoagulation Management and Venothromboembolism, Interventions and ACS, Interventions and Vascular Medicine**

Keywords: *Acute Coronary Syndrome, Anticoagulants, Blood Platelets, Coronavirus, COVID-19, Disseminated Intravascular Coagulation, Fibrinolytic Agents, Heparin, Low-Molecular-Weight, International Normalized Ratio, Myocardial Infarction, Outpatients, Percutaneous Coronary Intervention, Platelet Aggregation Inhibitors, Primary Prevention, Thrombosis, Vascular Diseases, Venous Thromboembolism, Venous Thrombosis*