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Suggestions for thromboprophylaxis and laboratory monitoring for in-hospital patients with COVID-19

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Growing evidence from multiple retrospective cohorts indicates that hospitalised COVID-19 patients often could suffer from an excessive coagulation activation leading to an increased risk of venous and arterial thrombosis (including small calibre vessels) and a poor clinical course [1]. Notably, D-dimer level at the time of hospital admission is a predictor of the risk of development of acute respiratory distress syndrome (ARDS) [2], the risk of intensive care admission and the risk of death [3]. An observational study among COVID-19 patients with elevated D-dimer levels at baseline showed that the 28-day mortality was lower in those receiving heparin than in those who did not [4].

Based on the available literature and published recommendations from the International Society of Thrombosis and Hemostasis (https://www.isth.org), from the American Society of Hematology (https://www.hematology.org/covid-19) and from the Society for Thrombosis and Haemostasis Research (http://gth-online.org), the Working Party on Hemostasis (Swiss Society of Hematology) proposes the following recommendations for pharmacological thromboprophylaxis in COVID-19 patients in the acute setting. Suggestions will be regularly updated:

- All in-hospital COVID-19 patients should receive pharmacological thromboprophylaxis according to a risk stratification score, unless contraindicated.
- In patients with creatinine clearance >30 ml/min, low molecular weight heparin (LMWH) should be administered according to the prescribing information. An increased dose should be considered in overweight patients (>100 kg).
- In patients with creatinine clearance <30 ml/min, unfractionated heparin (UHF) subcutaneously twice or three times daily or intravenously should be administered according to the prescribing information. An increased dose should be considered in overweight patients (>100 kg).
- Anti-Xa activity should be monitored when indicated (e.g., evidence of renal dysfunction).
- Antithrombin need not be monitored but this could be considered on an individual basis in cases of disseminated intravascular coagulation or sepsis-induced coagulopathy or heparin resistance.
- We suggest regularly monitoring prothrombin time, D-dimers, fibrinogen, the platelet count, lactate dehydrogenase (LDH), creatinine and alanine aminotransferase (ALT) (daily or at least 2−3 times per week).
- In patients in intensive care with a large increase in D-dimers, severe inflammation, or signs of hepatic or renal dysfunction or imminent respiratory failure, intermediate or therapeutic dosing of LMWH or UHF should be considered, according to the bleeding risk.
- Heparin-induced thrombocytopenia (HIT) should be considered in patients with fluctuations in platelet counts or signs of heparin resistance.
- In patients undergoing extracorporeal membrane oxygenation (ECMO) treatment we suggest maintaining UFH at doses bringing anti-Xa activity into the therapeutic range.
- There are no data on the use of direct oral anticoagulants.

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