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Nevzorov, Ilja

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Ilja Nevzorov, PhD, Riikka Tulamo, MD, PhD, Anders Albäck, MD, PhD, Riitta Lassila, MD, PhD

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1 **COVID-19 and SIC (!)**

2 Ilja Nevzorov, PhD¹, Riikka Tulamo, MD, PhD², Anders Aläck, MD, PhD² and Riitta Lassila,
3 MD, PhD^{3,*}.

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5 ¹ Faculty of Medicine, University of Helsinki, Helsinki, Finland.

6 ² Department of Vascular Surgery, Helsinki University Hospital, University of Helsinki, Helsinki,
7 Finland.

8 ³ Coagulation Disorders Unit, University of Helsinki, Departments of Haematology and Clinical
9 Chemistry (HUSLAB Laboratory Services), Comprehensive Cancer Center, Helsinki University
10 Hospital and Research Program in Systems Oncology, Faculty of Medicine, University of Helsinki,
11 Helsinki, Finland; Helsinki University, Faculty of Medicine, Research Program in Oncology,
12 Helsinki, Finland; Aplagon Oy, Helsinki, Finland.

13 * Corresponding Author: riitta.lassila@hus.fi

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15 To the Editor,

16 Accurate risk stratification tools are paramount for optimal disease management. Patients with
17 cardiovascular conditions, diabetes and cancer are most susceptible to COVID-19 complications
18 leading to poor outcome¹. These systemic diseases relate to enhanced fibrin formation and
19 thromboinflammation. Indeed, severity of peripheral occlusive arterial disease correlates with the
20 levels of both fibrinogen and its turnover measure D-dimer². In severe COVID-19-infection,
21 elevation of D-dimer and sepsis-induced coagulopathy (SIC), predicts poor prognosis. The
22 incidence of venous thromboembolism (VTE) in patients with severe COVID-19 pneumonia is
23 25% (!)³. Furthermore, endothelial injury inherent to vascular procedures may predispose to
24 coagulopathy in COVID-19. The benefit of low-molecular-weight heparin therapy is protection of
25 critically ill patients against VTE, as well as its putative anti-inflammatory properties. Pulmonary

1 embolism (PE), triggered by severe infection, may be masked by the symptoms and signs of
2 hypoxia in COVID-19. We advocate these considerations for vascular specialists.

3 A large retrospective Chinese cohort study¹ demonstrated that the fibrin turnover-measure D-dimer
4 exceeding 1 µg/mL on admission was associated with an increased risk of in-hospital death (OR 20,
5 95% CI 6.5-61.56, $P < .0001$) in COVID-19 patients. Another retrospective study⁴ assessed the
6 benefits of anticoagulation on 28-day mortality, which does not appear to differ between heparin
7 users (22%) and nonusers (mortality rates 30.3% vs 29.7%, respectively). However, patients with 6-
8 fold D-dimer levels (3 µg/mL) to normal clearly benefited from anticoagulation, translating to
9 lower mortality (32.8% vs 52.4%, $P = .017$). Therefore, D-dimer levels on admission are
10 particularly useful for risk stratification in COVID-19 patients (Fig. 1).

11 Another important predictor of mortality is the International Society of Thrombosis and
12 Haemostasis (ISTH) SIC-score⁵, which includes prothrombin time (ratio >1.5), platelet count (<100
13 $\times 10^9/l$) and sequential organ function assessment (SOFA-score). In the above-mentioned study³,
14 patients with ISTH SIC-score of ≥ 4 treated with anticoagulation showed again lower 28-day
15 mortality rates than the untreated ones (40% vs 64%; $P=.029$).

16

17 To guarantee the best outcomes for patients we suggest that all medical professionals, including
18 vascular specialists, adhere to ISTH guidelines on recognition and management of coagulopathy in
19 COVID-19 based on D-dimer and SIC-scores as major prognostic factors⁶ (Fig. 1).

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Figure 1. Outline of the algorithm for the management of coagulopathy in COVID-19 based on D-dimer and SIC-score. DVT – deep vein thrombosis, PE – pulmonary embolism, LMWH – low molecular weight heparin, SIC – sepsis-induced coagulopathy.

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