

# High incidence of thrombotic complications in ICU patients with COVID-19

## pneumonia Incidence of thrombotic complications in critically ill ICU patients with

### COVID-19

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#### Introduction and methods

COVID-19 can be accompanied with excessive inflammation, hypoxia, immobilization, and diffuse intravascular coagulation (DIC), which may predispose venous and arterial thromboembolism [1-4]. Patients who are admitted to the intensive care unit (ICU) are at highest thrombotic risk. However, thrombotic complications have hardly been described in patients with COVID-19. Knowledge on the incidence of thrombotic complications in COVID-19 patients is therefore important for determining the intensity of thromboprophylaxis.

This observational study evaluated the incidence of venous thromboembolism (VTE) and arterial thrombotic complications in 184 COVID-19 patients with proven pneumonia admitted to the ICU of 2 Dutch university hospitals and 1 Dutch teaching hospital between March 7th and April 5th, 2020. The median duration of observation was 7 days (IQR 1-13). All patients received at least standard doses thromboprophylaxis, but local protocols for thromboprophylaxis differed between hospitals and doses increased over time. Diagnostic tests were only performed if thrombotic complications were clinically suspected.

The composite outcome consisted of acute pulmonary embolism (PE), deep-vein thrombosis (DVT), ischemic stroke, myocardial infarction, or systemic arterial embolism.

#### Main results

- From the total of 184 patients, 22 patients were discharged alive (12%), 23 patients died (13%), and 139 patients (76%) were still on the ICU on April 5th.
- The cumulative incidence of the composite outcome was 31% (95%CI 20%-41%), of which VTE (confirmed by CTPA and/or ultrasonography) in 27% (95%CI 17%-37%) and arterial thrombotic events in 3.7% (95%CI 0%-8.2%).
- Among thrombotic complications, pulmonary embolism (PE) was the most frequent (n=25, 81%).
- Age and coagulopathy (spontaneous prolongation of prothrombin time >3s or activated partial thromboplastin time >5s) were independent predictors of thrombotic complications (adjusted HR [aHR] 1.05/per year, 95%CI 1.004-1.01 for age; aHR 4.1, 95%CI 1.9-9.1 for coagulopathy).

## **Conclusion**

This observational study showed a cumulative incidence of venous and arterial thrombotic complications of 31% during ICU admission of patients with COVID-19 pneumonia with PE being the most common thrombotic complication.

The authors state that the “findings reinforce the recommendation to strictly apply pharmacological thrombosis prophylaxis in all COVID-19 patients admitted to the ICU, and are strongly suggestive of increasing the prophylaxis towards high-prophylactic doses, even in the absence of randomized evidence.” Finally, the authors propose that “rather than treating all patients with COVID-19 infections at the ICU with therapeutic anticoagulation, physicians should be vigilant for signs of thrombotic complications, and order appropriate diagnostic tests at a low threshold [5].”