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## Hospital-based use of thromboprophylaxis in patients with COVID-19

Physicians are receiving a great deal of information regarding how to care for patients with coronavirus disease 2019 (COVID-19). We would like to offer further information about thromboprophylaxis that we believe is worth considering when treating patients who have been admitted to hospital with COVID-19.

Tang and colleagues<sup>1</sup> described a consecutive series of 183 patients who had been admitted to hospital with COVID-19 in China. Activation of the coagulation system was found in many patients, and the degree of activation (defined as, for example, increased D-dimer concentrations at time of admission) was significantly higher in patients who did not survive than those who did survive. Overall, 21 (11%) of 183 patients died. 15 (71%) of 21 non-survivors and only one (1%) of 162 survivors met criteria for disseminated intravascular coagulation during their hospital stay. In a case series from China,<sup>2</sup> increased D-dimer concentration at time of admission to hospital (>1 µg/mL) was associated with a risk of in-hospital mortality that was 18 times higher than among those with normal D-dimer concentrations, and the authors highlighted that “inadequate adherence to standard supportive therapy”, among other things, might have led to poor outcomes in some patients.<sup>2</sup>

Acutely ill patients with severe viral pneumonia and acute respiratory distress syndrome (ARDS), such as those with H1N1 infection, who have been admitted to hospital have a 23-times increased risk for pulmonary embolism,<sup>3</sup> and guidelines support routine thromboprophylaxis in these patients.<sup>4</sup> Increased D-dimer concentrations of more than double the upper limit of normal has emerged as a new biomarker to predict risk of venous thromboembolism in all

patients in hospitals. Trial subgroup analyses, in which increased D-dimer concentration or admission to hospital with infection (particularly pneumonia) were incorporated as variables, show that extended thromboprophylaxis with direct oral anticoagulants has benefit compared with routine in-hospital thromboprophylaxis with low molecular weight heparin.<sup>5</sup> Finally, empirical anticoagulation has been associated with improved thrombotic event-free survival in critically ill patients with ARDS due to influenza A H1N1.<sup>3</sup>

In light of this evidence, and the fact that hospitals might soon have a large number of patients with COVID-19 who might meet guideline requirements for thromboprophylaxis, we believe it seems prudent to use thromboprophylaxis in such patients, particularly those with evidence of activation of the coagulation system (eg, increased D-dimer concentrations) on admission.

Of utmost importance will be the prospective, real-time data collection to assess whether use of thromboprophylaxis in patients with COVID-19 leads to improved outcomes, including improved survival, without clinically important bleeding.

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