

## 2020 — Year of COVID-19

On the morning of Saturday, 15 February 2020, JTH received a submission from Dr. Ning Tang and colleagues from Wuhan, China, describing a series of patients with coronavirus 19-associated pneumonia in whom poor prognostic outcomes were accompanied by abnormal coagulation parameters. This study of 183 patients had been completed in just 5 weeks since the first cases of COVID-19 disease were reported in Wuhan. Subsequent to this initial report, a second manuscript was received from Dr. Tang and colleagues describing a reduction in mortality for patients with severe COVID-19 disease with the use of anticoagulation. These manuscripts have attained the highest Altmetric scores ever for JTH publications, and the rest, as they say, is history.

As this editorial is being written in late July, the world has just experienced its largest single-day documentation of new COVID-19 cases, 284 196, and the total global number of cases stands at 15 636 812. Three countries have now recorded more than a million cases of COVID-19, the United States (>4 million), Brazil (>2 million), and India (>1 million), and global deaths from the disease amount to 636 404. The pandemic continues 7 months after its first appearance, and it is unclear whether we are now entering a second wave of infection or whether the initial infection has yet to be resolved.

The pandemic has, over the past 7 months, brought about dramatic changes to our world in many ways, and many of these changes will persist. Aside from the catastrophic health outcomes, many aspects of our everyday lives have been affected, and the economic prospects for the foreseeable future are desperate. With reference to our restricted world of hemostasis and thrombosis, and to the wider community of biomedical science, it is also obvious that things will never be the same.

Engagement of the global hemostasis and thrombosis community in advancing knowledge relating to COVID-19 has been spectacular. Mortality from this disease has two major pathological elements—deteriorating lung function and thrombosis. Very quickly from early work by clinicians like Ning Tang, it was clear that an associated coagulopathic state developed in severe cases of COVID-19 and that intervention with anticoagulation reduced mortality.

Since these earliest reports, our pathogenic knowledge of the coagulopathy has advanced rapidly and shows a complex engagement of many aspects of the hemostatic system with abnormal activation of platelets, alterations of the fibrinolytic system, and an intense activation of the endothelium that possesses the ACE-2 receptor for the SARS-CoV-2 virus. The persistent endotheliitis that has been documented in some cases may well play a critical role in the thrombotic tendency seen in these patients who develop both in situ pulmonary and widespread micro- and macrovascular thrombotic events that can occur during both the acute illness and in the subsequent weeks of convalescence.

In the meantime, many therapeutic interventions have been studied to mitigate the profound proinflammatory environment that is present, and to reduce the likelihood of thrombosis. Observational studies of anticoagulant interventions have been promising, and we now await the results of the many prospective randomized trials that are in progress to determine the optimal strategy to reduce the thrombotic burden in this population.

Over the past 6 months, JTH has received >500 submissions relating to COVID-19, and our total submission count at the end of June is close to our 1-year total in 2019. The rate of collection of COVID-related data and generation of reports has been unsurpassed. This change in the rate and type of knowledge dissemination has affected not only the conventional reporting media such as JTH but also the social media and, increasingly, preprint servers such as bioRxiv.org and medRxiv.org, as authors move to transmit their new information quicker and to wider audiences. These changes have occurred against the preexisting growing interest in open access publishing, a principle that continues to gain momentum throughout the world of scientific publication. There seems little doubt that the events of the past 6 months will serve to accelerate the changes in publication policies that we were already beginning to witness prior to COVID.

So, what of the future, post-COVID? Extraordinary amounts of money have been spent by governments during the pandemic to support biomedical investigation and innovation and to provide bridge support for failing businesses. Enormous deficits will be inevitable in the coming years, and there must be a significant concern that funds to maintain biomedical science discovery and innovation, and optimal clinical care infrastructures will be jeopardized by the spending frenzy of 2020.

In the meantime, the global hemostasis community has contributed brilliantly to the challenge presented by COVID. The wide spectrum of responses, from advancement of the basic biological understanding of the coagulopathy to therapeutic interventions to reduce thrombosis incidence, represents the full potential of the community's collective knowledge and impact.

As we look ahead to the final months of this extraordinary year, take care, keep safe, and be kind to one another.

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