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EDITORIAL (for March 2022 issue of JTH)

Scientific method and the COVID pandemic

As we write this editorial in mid-January, there is snow on the ground and temperatures are seasonably cool in our respective homes in Michigan and Southern Ontario. This is the third winter in which COVID-19 has been an unwelcome intruder in our lives around the globe. Indeed, it was on February 15th 2020 that JTH received the first manuscript submission from Wuhan describing a severe respiratory disease associated with a complex coagulopathy.

We sincerely hope this is the last editorial we write that focuses on COVID-related issues, but the emergence of the highly transmissible Omicron variant reminds us that this microbe is not finished with us just yet.

In this editorial, we have considered the many aspects of the hemostasis and thrombosis communities that have been impacted by this pandemic. Suffice it to say that aside from the key engagement of infectious disease and public health professionals, our community has often been at the forefront of the scientific and clinical challenges posed by COVID. The response to these challenges has been rapid, informed and critical in reducing mortality from the thrombotic complications that have accompanied the severe forms of this infection. Furthermore, the subsequent rare complications seen with some COVID vaccines also posed serious questions that have been handled expeditiously and effectively by hemostasis scientists and clinicians.

One detail that still seems surreal about experiences during the pandemic is the speed with which events have been observed, communicated and acted upon. As an initial example, the original report from Wuhan described abnormal coagulation parameters in 183 patients admitted to hospital with severe novel coronavirus pneumonia between January 1st and February 3rd 2020. This manuscript was submitted

on February 15th and appeared in JTH on February 19th.[1] A similar speed of response and communication accompanied the VITT complication of COVID vaccination,[2,3] and in both instances comprehensive and complex basic science studies have been completed to understand the underlying pathophysiology of these events.

JTH has now received >1,500 articles relating to COVID and COVID vaccination complications, and of course the vast majority of these reports have not appeared in the journal. Some have been published by our companion journal, *Research and Practice in Thrombosis and Haemostasis*, and many have been published in other journals. While the numbers of COVID-related manuscripts being submitted has now fallen significantly, we are still seeing large clinical trial reports of anticoagulant interventions, and the clinical presentation and mechanistic explanation of Long COVID is still an area of active investigation.[4]

Thus, while it is easy to state that biomedical science has moved very quickly and effectively to identify, characterise and develop treatments and vaccines for this infectious disease, it is also clear that the very public face of science during these two years has prompted a range of public opinion. Hopefully, most of the public will have recognized the commitment of the scientific community and come away with a better appreciation of the complexity of disease characterization and management.

However, the course of the pandemic has been so rapid that many medical decisions and scientific questions have had to be addressed with a knowledge base that would previously have been considered insufficient to generate valid responses. The hemostasis biomedical community is accustomed to the months or years that are usually required to provide sound evidence to prove a biological theory or to test a novel treatment, but for the past two years we have not had the luxury of time. While these rapid responses have been crucial to limit the morbidity and mortality associated with COVID infection, they haven't always been based on the most informed science, and even when there has been scientific rationale, it has often been a great deal less robust than we all would have desired.

COVID will leave a multi-year imprint on all our lives, mostly for reasons we will try to forget. Hemostasis clinicians and scientists have responded brilliantly to the

challenges posed by COVID, but many of us look forward to returning to a world where the scientific method can be re-established in a manner and timeframe that provides assurance of better understanding and management of the complex processes that result in human biology and disease.

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