

# The art and science of the thrombosis with thrombocytopenia syndrome

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In general, we tend to associate 21st century medicine with ground-breaking technological advancements. Looking no further than the COVID-19 experience, the unparalleled development of effective vaccines against SARS-CoV-2 has been nothing short of breath-taking. In reality, the art of medicine still lies much at the heart of medicine, for example, in making astute clinical observations and recognising new patterns of disease. This is well illustrated by the description of the new clinical syndrome of vaccine-induced immune thrombotic thrombocytopenia (VITT), now referred to by the Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA) as thrombosis with thrombocytopenia syndrome (TTS).<sup>1</sup>

Many will recall how those first reports in March 2021 caused clinical concern and high media interest with the potential to adversely impact COVID-19 vaccine uptake.<sup>2,3</sup> A number of patients had developed blood clots in the major veins of the brain or in the abdomen together with a low level of platelets in the blood. This combination of thrombosis with thrombocytopenia is very unusual and, unfortunately, some of the affected individuals died. Although a mechanistic link is not yet proven, there is strong epidemiological evidence that this represents a very rare adverse effect of SARS-CoV-2 vaccines and, in particular, adenoviral-vectored vaccines.

In this edition, Chevassut *et al* describe how UK haematologists recognised, managed and disseminated information on this new syndrome.<sup>4</sup> They also need to be complimented for exemplifying the other arts of being a good doctor, ie in quickly building alliances to share experiences, advance knowledge and communicate sensitively. What is admirable is how quickly this expert panel of haematologists formed and in such an inclusive manner from all corners of the country and irrespective of

academic affiliation or professional seniority. The HaemSTAR group of trainees who are networked through the National Institute for Health Research (NIHR) quickly became involved, as did the British Society for Haematology (BSH), to provide support and linkage to other professional organisations, including the Royal College of Physicians.<sup>5,6</sup>

What we have also learnt from this and other experiences from the COVID-19 pandemic is the importance of balance in the optimal practice of medicine; calibrating core medical skills with specialist knowledge as well as integrating academic enquiry and research into clinical practice. Going forward, understanding of the mechanisms of vaccine-induced TTS will both inform development of second-generation COVID-19 vaccines and help to identify new therapies to reduce the case fatality associated with TTS. Going further forward, we need to remember this as a classic example of the art and science of medicine coming together with meaningful impact to patients and to society. ■

## References

- 1 Makris M, Pavord S, Lester W, Scully M, Hunt B. Vaccine-induced immune thrombocytopenia and thrombosis (VITT). *Res Pract Thromb Haemost* 2021;5:e12529.
- 2 Greinacher A, Thiele T, Warkentin TE *et al*. Thrombotic thrombocytopenia after ChAdOx1 nCov-19 Vaccination. *N Engl J Med* 2021;384:2092–101.
- 3 Schultz NH, Sørvoll IH, Michelsen AE *et al*. Thrombosis and thrombocytopenia after ChAdOx1 nCoV-19 vaccination. *N Engl J Med* 2021;384:2124–30.
- 4 Chevassut T, Hunt B, Pavord S. VITT, COVID-19 and the EHP: The story of how the UK responded to emerging cases of vaccine-induced immune thrombocytopenia and thrombosis during the vaccination programme. *Clin Med* 2021;21:eXXX–eXXX.
- 5 Nicolson PLR, Desborough M, Hart D *et al*. A HaemSTAR is born; a trainee-led, UK-wide research network in haematology. *Clin Med* 2019;19:532–3.
- 6 Toh CH, Amberley K. Blood works. *Br J Haematol* 2020;189:391–2.

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