In brief

Cerebral venous sinus thrombosis after AstraZeneca vaccination

30 April 2021

Background

- In recent weeks there have been concerns about blood clots occurring in patients after they were given the AstraZeneca vaccine.(1) Most reports involved women under 55 years.(2)
- These reports included 18 cases of cerebral venous sinus thrombosis (as of 17 March 2021).(3)
- Cerebral venous sinus thrombosis (CVST) refers to the presence of a blood clot in the dural venous sinuses, which drain blood from the brain. Symptoms may include: headache, abnormal vision, any of the symptoms of stroke, such as weakness of the face and limbs on one side of the body and seizures.(4)
- CVST is rare, occurring at a rate of between two and five people per million.(4)
- Cerebral venous sinus thrombosis (CVST) can be a complication of COVID-19. A case series of 14 patients noted most received anticoagulation (91.7%) and a mortality rate of 45.5%.(5, 6)
- The main treatment for CVST is anticoagulation. There are, however, concerns that heparin is contraindicated in the rare cases of CVST following vaccination (particularly with AstraZeneca vaccine).(7)
- It has been proposed in Germany and Norway that post-AstraZeneca vaccination CVST may be similar to a syndrome known as heparin-induced thrombocytopaenia or HIT (sometimes referred to as heparin-induced thrombotic thrombocytopaenia or HITT.(8, 9)
- HIT is characterised by an anti-platelet factor 4 antibody response – leading to platelet consumption and thrombosis.(10)
- Notably, HIT features high thrombotic risk despite only mild to moderate thrombocytopenia. For example, the median platelet count nadir in HIT is approximately 55 to 70 × 10^9/L, with a high proportion of patients (~30-50%) with platelet count nadirs >100 × 10^9/L or even >150 × 10^9/L developing thrombotic events.(11)
- It is diagnosed by a HITTS screen.(12)
- The standard anticoagulants used in HIT are argatroban (not currently registered in Australia), and bivalirudin.(10)
- The UK Medicines and Healthcare products Regulatory Agency (MHRA) is undertaking a detailed review of the five cases of CVST with low blood platelets that occurred in the UK, and also notes that these events can occur naturally.(13)

Note: While early minor headache is common with COVID-19 vaccines, it is delayed onset (within days 4-14) of persisting headache, dizziness or visual changes in particular, that indicate further investigation of CVST; with platelet count and film, then antibodies and imaging.

Current Guidance

- World Health Organisation (19 March 2021): AstraZeneca COVID-19 vaccine continues to have a positive benefit-risk profile and available data does not suggest any overall increase in clotting conditions. There have been very rare reports of thromboembolic events in combination with thrombocytopenia, such as CVST in Europe, however no causal relationship has been established. Education should be provided to health-care professionals and people being vaccinated to recognise the signs and symptoms of all serious adverse events and ongoing monitoring and investigation of adverse events should be done.(14)
- Australian Government Department of Health (25 March 2021): Benefits of the COVID-19 vaccine far outweigh this potential risk in people with history of clotting conditions. However, vaccination with any COVID-19 vaccine should be deferred for people who have a history of CVST and/or heparin-induced thrombocytopenia. This is only a precautionary measure until further information from ongoing investigations is available.(15)
- Australian Therapeutic Goods Administration (19 March 2021): The TGA has not received any reports of blood clots following administration of the AstraZeneca COVID-19 vaccine in Australia. It advises that people continue to get the AstraZeneca vaccine when eligible.(13)
- Medicines and Healthcare products Regulatory Agency (18 March 2021): UK advice remains that the benefits of the vaccines against COVID-19 continue to outweigh any risks and that the public should continue to get their vaccine when invited to do so.(16)
- International Society on Thrombosis and Haemostasis (ISTH) (12 March 2021): Recommends that all eligible adults continue to receive their COVID-19 vaccinations even for patients with a history of blood clots or for those taking blood thinning medications.(17)
- HSE National Immunisation Office (19 March 2021): Those receiving long term anticoagulation with either warfarin or heparin are not considered to be at higher risk of bleeding complications following immunisation.(18)
- NHS (last updated 12 Feb 2021): The vaccine can be given intramuscularly to individuals with a bleeding disorder. If the patient is receiving regular treatment to reduce bleeding (for example, patients with haemophilia) vaccine administration can be scheduled to occur shortly after this treatment is given.(19)

To inform this brief, PubMed and targeted website and Google searches were completed on 25 March 2021. The Critical Intelligence Unit maintains a living evidence table on COVID-19 vaccines.

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