

In brief

COVID-19 vaccines and clotting disorders

30 April 2021

Background

- 8 April 2021: [ATAGI](#) (Australian Technical Advisory Group on Immunisation) recommends that COVID-19 vaccine by Pfizer is preferred over AstraZeneca in adults aged under 50 years.(1)
- 8 April 2021: [Therapeutic Goods Administration](#) notes investigation of unusual thrombosis in Australian vaccine recipient points to likely association, but insufficient evidence for firm conclusion.(2)
- 7 April 2021: European Medicines Agency review of 62 cases of cerebral venous sinus thrombosis and 24 cases of splanchnic vein thrombosis concludes unusual blood clots with low blood platelets should be listed as [very rare side effects](#) with AstraZeneca. Most cases occur in women under age 60 within two weeks of vaccination, although some of this may reflect greater exposure of such individuals due to targeting of particular populations for vaccine campaigns. Overall benefits outweigh risks.(3)
- March 2021: [Canada](#) and [Germany](#) suspend use of AstraZeneca vaccine in people younger than 55 and 60 years, respectively. [UK Government](#) says it is preferred that people under 30 years be offered an alternative vaccine.(4-6)
- There are however, concerns around complications with other COVID-19 vaccines and these have received less attention.

Evidence of complications with vaccines other than AstraZeneca

- 5 April 2021: The Association of American Physicians and Surgeons (AAPS) [news article on blood clotting](#) notes at least 37 people have developed a rare platelet disorder after receiving the Pfizer or Moderna vaccine; a 56-year-old Florida obstetrician died three days after receiving the Pfizer product.(7)
- 11 March 2021: A letter in the BMJ posited that mRNA vaccines (Pfizer, Moderna) and those using adenoviruses (AstraZeneca, Johnson & Johnson) could induce [synthesis of the COVID spike protein](#) within platelets, which may then trigger autoimmune reactions against platelets.(8)
- 19 February 2021: In a case series, Lee et al reviewed 20 reports of [thrombocytopenia](#) after receipt of the Pfizer and Moderna COVID-19 vaccines in the USA; 17 of these patients did not have pre-existing thrombocytopenia. Median age was 41 and 11 were women. Note that 'all but one' of these cases occurred after the first dose of the Pfizer or Moderna vaccine.(9)

From the Critical Intelligence Unit living table on Pfizer

- Extremely rare cases of immune [thrombocytopenia \(<1 case per million\)](#), attribution not determined.(9)

From the Critical Intelligence Unit Living table on Moderna

- Extremely rare immune [thrombocytopenia \(<1 case per million\)](#), attribution undetermined.(9)

To inform this brief, PubMed and google searches were run using terms 'blood clot' and 'Pfizer' or 'Moderna' on 9 April 2021. The Critical Intelligence Unit maintains a living evidence table on [COVID-19 vaccines](#).

References

1. World Health Organisation. Who can take the Pfizer-BioNTech COVID-19 vaccine? Accessed on 14 January 2021 Available from: <https://www.who.int/news-room/feature-stories/detail/who-can-take-the-pfizer-biontech-covid-19-vaccine>. 2021.
2. Regulatory affairs professionals society. COVID-19 vaccine tracker. Accessed on 14 January 2021 Available from: <https://www.raps.org/news-and-articles/news-articles/2020/3/covid-19-vaccine-tracker>. 2021.
3. Afkhami S, Yao Y, Xing Z. Methods and clinical development of adenovirus-vectored vaccines against mucosal pathogens. *Molecular therapy Methods & clinical development*. 2016;3:16030.
4. Janeway CA Jr TP, Walport M, et al. *Immunobiology: The Immune System in Health and Disease*. 5th edition. <https://www.ncbi.nlm.nih.gov/books/NBK27162/> teNYGSTdafoiiAf, editor.
5. Therapeutic Goods Administration. Norwegian investigation of COVID-19 vaccination risks for elderly, very frail patients. Accessed on 17 January 2021 Available from: <https://www.tg.gov.au/media-release/norwegian-investigation-covid-19-vaccination-risks-elderly-very-frail-patients> 2021.
6. Torjesen I. Covid-19: Norway investigates 23 deaths in frail elderly patients after vaccination. *Bmj*. 2021;372:n149.
7. Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine - United States, December 14-23, 2020. *MMWR Morbidity and mortality weekly report*. 2021;70(2):46-51.
8. Wise J. Covid-19: European countries suspend use of Oxford-AstraZeneca vaccine after reports of blood clots. *Bmj*. 2021;372:n699.
9. Lee EJ, Cines DB, Gernsheimer T, Kessler C, Michel M, Tarantino MD, et al. Thrombocytopenia following Pfizer and Moderna SARS-CoV-2 vaccination. *American journal of hematology*. 2021.

SHPN: (ACI) 210348 TRIM: ACI/D21/695-14