

- [3] De Santis O, Audran R, Pothin E, Warpelin-Decrausaz L, Val-lotton L, Wuerzner G, et al. Safety and immunogenicity of a chimpanzee adenovirus-vectored Ebola vaccine in healthy adults: a randomised, double-blind, placebo-controlled, dose-finding, phase 1/2a study. *Lancet Infect Dis* 2016;16:311–20, [http://dx.doi.org/10.1016/S1473-3099\(15\)00486-7](http://dx.doi.org/10.1016/S1473-3099(15)00486-7).
- [4] Ewer K, Rampling T, Venkatraman N, Bowyer G, Wright D, Lambe T, et al. A monovalent chimpanzee adenovirus Ebola vaccine boosted with MVA. *N Engl J Med* 2016;374:1635–46.
- [5] Atasheva S, Yao J, Shayakhmetov DM. Innate immunity to adenovirus: lessons from mice. *FEBS Lett* 2019;593:3461–83.
- [6] Brunetti-Pierri N, Palmer DJ, Beaudet AL, Carey KD, Finegold M, Ng P. Acute toxicity after high-dose systemic injection of helper-dependent adenoviral vectors into nonhuman primates. *Hum Gene Ther* 2004;15:35–46.
- [7] Voysey M, Clemens SAC, Madhi SA, Weckx LY, Folegatti PM, Aley PK, et al. Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet* 2021;397:99–111.
- [8] Yu J, Yuan X, Chen H, Chaturvedi S, Braunstein EM, Brodsky RA. Direct activation of the alternative complement pathway by SARS-CoV-2 spike proteins is blocked by factor D inhibition. *Blood* 2020;136:2080–9.
- [9] Zuo Y, Estes SK, Ali RA, Gandhi AA, Yalavarthi S, Shi H, et al. Prothrombotic autoantibodies in serum from patients hospitalized with COVID-19. *Sci Transl Med* 2020;12(570):eabd3876.
- [10] Zores F, Rebeaud ME. COVID and the renin-angiotensin system: are hypertension or its treatments deleterious? *Front Cardiovasc Med* 2020;7:71.

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## Atypical thrombosis associated with VaxZevria® (AstraZeneca) vaccine: Data from the French Network of Regional Pharmacovigilance Centres

**Keywords** VaxZevria®; Covid-19 vaccine; Pharmacovigilance; Atypical thrombosis; Thrombopenia; Anti-PF4 antibodies

### Abbreviations

ADRs	adverse drug reactions
ANSM	French Medicines Agency
COVID-19	coronavirus disease 2019
CRPV	French Regional Pharmacovigilance Network
CVT	cerebral venous thrombosis
DIC	disseminated intravascular coagulation
EMA	European Medicines Agency
SARS-CoV-2	severe acute respiratory coronavirus 2 syndrome
ST	splanchnic thrombosis
TTS	thrombosis with thrombocytopenia syndrome
VIPIT	vaccine-induced prothrombotic immune thrombocytopenia

Starting in late 2019, the initial cases of a previously unknown form of pneumonia, now referred to as coronavirus disease 2019 (COVID-19), led to a global pandemic. In response, most countries have sought to curb the spread of the virus by imposing periods of lockdown as a function of the national infection rates. By the end of 2020, the advent of vaccines against this severe acute respiratory coronavirus 2 syndrome (SARS-CoV-2) prompted new hope in the global fight against the COVID-19 pandemic. In Europe, mRNA vaccines and adenovirus vector vaccines have received conditional marketing authorizations for active immunization against SARS-CoV-2 in individuals aged 16 and over.

On January 29th, 2021, the European Medicines Agency (EMA) authorized VaxZevria®, the AstraZeneca adenovirus vector vaccine directed against SARS-CoV-2 and in France, the campaign officially started on February 6, 2021.

These new vaccine technologies are now considered to be the best option of countering the COVID-19 pandemic. Given the high level of population likely to be exposed to these drugs, vaccine safety is a critical issue. In order to promptly and accurately identify potential new signal, the French Medicines Agency (ANSM) oversees the assessment of vaccine safety and has initiated a specific strengthened surveillance system for adverse drug reactions (ADRs) related to COVID-19 vaccines in France. This system is based on the collaboration between the Regional Pharmacovigilance Network (CRPV) and the expert council of the specific ANSM/CRPV monitoring committee for vaccines [1].

In this letter, we describe and discuss the VaxZevria® associated-atypical thrombosis specific signal identified by this committee.