Case Report

Vaccine-Induced Immune Thrombotic Thrombocytopenia with Disseminated Intravascular Coagulation and Death following the ChAdOx1 nCoV-19 Vaccine

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Coronavirus is a novel human pathogen causing fulminant respiratory syndrome (COVID-19). Although COVID-19 is primarily a disease of the lungs with florid respiratory manifestations, there are increasing reports of cardiovascular, musculoskeletal, gastrointestinal, and thromboembolic complications. Developing an effective and reliable vaccine was emergently pursued to control the catastrophic spread of the global pandemic. We report a fatal case of vaccine-induced immune thrombotic thrombocytopenia (VITT) after receiving the first dose of the ChAdOx1 nCoV-19 vaccine. We attribute this fatal thrombotic condition to the vaccine due to the remarkable temporal relationship. The proposed mechanism of VITT is production of rogue antibodies against platelet factor-4 resulting in massive platelet aggregation. Healthcare providers should be aware of the possibility of such fatal complication, and the vaccine recipients should be warned about the symptoms of VITT.

Key Words: COVID-19—Vaccine—Vaccine-induced Immune Thrombotic Thrombocytopenia—Cerebral Venous Sinus Thrombosis—Disseminated Intravascular Coagulation—Death

Introduction

Coronavirus is a novel human pathogen causing fulminant respiratory syndrome (COVID-19) that was first identified in December 2019 as a cluster of cases with fatal pneumonia in Wuhan, China.[1] In March 2020, the World Health Organization declared a worldwide pandemic and designated the disease taxonomy as COVID-19.[2] Although COVID-19 is primarily a disease of the lungs with florid respiratory manifestations, there are increasing reports of cardiovascular, musculoskeletal, gastrointestinal, and thromboembolic complications.[3] Developing an effective and reliable vaccine was emergently pursued to control the catastrophic spread of the global pandemic. Traditionally, vaccine development progresses through several pre-clinical and clinical stages occurring sequentially, and each may take a considerable time for completion. This was not the case with the COVID-19 vaccine as these stages were accelerated to an unprecedented pace with a seamless transition from one stage to the other over a few months. Inactivated or live-attenuated viruses as well as recombinant proteins and vectors technologies have been deployed to develop the COVID-19 vaccine. In addition, new platforms such as RNA and DNA vaccines are also used for the first time in a licensed vaccine.[4] We report a fatal case of vaccine-induced immune thrombotic thrombocytopenia (VITT) after receiving the first dose of the ChAdOx1 nCoV-19 vaccine with emphasis on the possible pathophysiology behind this complication.

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