Three cases of acute venous thromboembolism in females after vaccination for coronavirus disease 2019

Elizabeth A. Andraska, MD, MS, Rohan Kulkarni, MD, Mirnal Chaudhary, MD, *and* Ulka Sachdev, MD, *Pittsburgh, Pa*

ABSTRACT

Since December 2020, four vaccines for SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) have been developed, and three have been approved for immediate use in the United States. Two are mRNA vaccines, and one uses a viral vector mechanism. Thrombotic complications have been reported after vaccine administration, which were primarily cerebral sinus thromboses after administration of the viral vector vaccines. To the best of our knowledge, we are the first to report venous thrombotic complications within days of administration of the mRNA-1273 (Moderna) vaccine. We present a series of three women who developed venous thromboembolism after RNA-1273 vaccination at a single healthcare system. (J Vasc Surg Venous Lymphat Disord 2022;10:14-7.)

Keywords: COVID-19; Deep vein thrombosis; Pulmonary embolism; Venous thromboembolism

In response to the coronavirus disease 2019 (COVID-19) pandemic caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), four vaccines were rapidly developed worldwide. Two of these vaccines use mRNA coded to the spike protein antigen of SARS-CoV-2, and two use a viral vector for vaccination.[1] Three of these vaccines have been approved in the United States, and since December 2020, the United States has vaccinated >60 million people. Although the vast majority of persons have experienced uncomplicated vaccinations, documentation of serious thrombotic complications after administration of COVID-19 vaccines has been growing.[2,3] Furthermore, recent cases of cerebral venous sinus thrombosis in women after receiving the Ad26.COV2.S (Janssen Pharmaceuticals, Johnson & Johnson, Beerse, Belgium) vaccine have been reported,[4] which caused the U.S. Food and Drug Administration to recommend a pause in its use in the United States on April 13, 2021.[5]

The mRNA-1273 (Moderna) vaccine (Moderna, Cambridge, Mass) was first approved in December 2020. Since then, its safety profile has been excellent, with most adverse events reported involving flu-like symptoms and muscle pain.[6] Although cases of thrombotic complications have been documented after other vaccines, to the best of our knowledge, no cases of thrombotic complications after the mRNA-1273 vaccine have been documented. We present a series of three women who presented to a single hospital system with acute venous thromboembolism (VTE) shortly after vaccination with the mRNA-1273 vaccine.

CASE REPORT

Index patient. An otherwise healthy 25-year-old woman had presented to the emergency department 2 days after receiving the first of the mRNA-1273 vaccine series with acute-onset shortness of breath and dyspnea on exertion. She had been taking oral contraceptive pills (OCPs) for years before the present admission.

The clinical details are outlined in the Table. On presentation, she did not require supplemental oxygen. An echocardiogram was performed, which revealed mild to moderate right ventricular strain. Computed tomography angiography (CTA) with a dedicated pulmonary embolism (PE) protocol (CTA-PE) revealed bilateral segmental PE (Fig 1). Venous Doppler ultrasound scans showed no deep vein thrombosis (DVT). She was admitted to the intensive care unit, intravenous heparin was started, and she was monitored. Her symptoms improved with heparin administration. She was discharged on hospital day 3 after transitioning to apixaban.

Subsequent patients. A 77-year-old woman with a history of gastrointestinal bleeding had presented to the emergency department with a 4-day history of shortness of breath. She had received the first of the mRNA-1273 vaccine series 3 days before symptom onset. She had a remote history of breast cancer, which had been diagnosed and treated in 2009. She had been prescribed raloxifene for osteoporosis, which she stated she had been taking for years.

Her clinical details are also listed in the Table. She had required 6 L of supplemental oxygen on arrival to the hospital. The

From the Heart and Vascular Institute, University of Pittsburgh Medical Center.

This research was supported in part by the National Heart, Lung, and Blood Institute, United States (grant 5T32HL0098036 to E.A.A.). The University of Pittsburgh, United States holds a Physician-Scientist Institutional Award from the Burroughs Wellcome Fund (to E.A.A.).

Author conflict of interest: none.

Correspondence: Elizabeth A. Andraska, MD, MS, Heart and Vascular Institute, University of Pittsburgh Medical Center, UPMC Presbyterian Hospital, Room E362.4, South Tower, 200 Lothrop St, Pittsburgh, PA 15213-2582 (e-mail: andraskaea@upmc.edu).

The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2213-333X

https://doi.org/10.1016/j.jvsv.2021.07.009