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Case Report of Myopericarditis post COVID-19 Vaccinations in the first female young adult in MS

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Introduction

In the United States, as of July 30, 2021, only the Pfizer-BioNTech BNT162b2 mRNA COVID-19 vaccine is authorized for use for children aged 12-17 years. By June of 2021, individuals, particularly males had received the Pfizer-BioNTech vaccine and especially after the administration of the second dose, started reporting cases of myocarditis and pericarditis (Hause et al., 2021). Myocarditis and pericarditis rates were evaluated from both the Vaccine Adverse Event Reporting System (VAERS) along with the Vaccine Safety Datalink (VSD) by physicians at CDC and by the Clinical Immunization Safety Assessment (CISA) Project investigators (Gargano et al., 2021). On June 23, 2021, the CDC's Advisory Committee on Immunization (ACIP) reviewed available data and concluded that the benefits of using the mRNA Pfizer vaccine outweighed the risks of myocarditis and pericarditis at both the individual and population level. As a result, ACIP recommended the continuation of administering these vaccines to persons above the age of 12 (Hause et al., 2021). The following case report outlines the first female adolescent patient diagnosed with COVID-19 vaccine-related suspected myocarditis in the state of Mississippi (MS).

The Case

In May 2021, an 18-year-old female patient presented to the ED with chest pain, which began immediately after she received the second dose of her COVID-19 vaccine. She had received the Pfizer BioNTech mRNA vaccine. Her past medical history was significant for abnormal uterine bleeding for which she was on oral contraceptive pills. The chest pain was substernal and persistent with an intensity of 8/10. Pain improved on laying still and worsened while bending forward. She admitted to experiencing mild shortness of breath on exertion, had fevers (maximum temperature of 100.2), backache, nausea, and vomiting, but denied palpitations, diarrhea, or syncope. Patient also reported myalgia and low-grade fever immediately following her second dose of the COVID-19 vaccine but admitted to resolution of both symptoms.

The chest pain, however, worsened on the day of presentation, which was 24 hours after the second dose of vaccination was administered. The patient reported no history of allergies. In the ED, she was afebrile, and other vital signs were stable except for tachycardia with a HR of 106. Physical exam was within normal limits, where the patient was alert and oriented to time, person, and place. Heart exam was normal with normal heart sounds, regular rate and rhythm, with palpable pulses on all extremities and no edema or cyanosis of extremities. Her lungs were clear to auscultation, and breathing was unlabored. Her abdomen was soft, non-tender, with bowel sounds present on auscultation. EKG findings were negative for ischemia. A bedside ultrasound performed was negative for fluid in pericardial sac. CTPE was negative for PE and showed mild left axillary node enlargement. Inflammatory markers were elevated with CRP of 9.3 and ESR of 38. Troponin was 0.082, which was concerning for myocarditis and required admission to

Internal Medicine. A transthoracic ECHO was performed, showing normal ejection fraction but also positive for trivial pericardial effusion. Highest troponin level recorded during duration of hospital stay was 2.6. Complete Blood Counts and Comprehensive Metabolic Panels were within normal limits. RT-PCR for SARS-CoV-2, Influenza A/B and RSV were negative. With myopericarditis being the probable diagnosis, cardiology was consulted for further recommendations and workup.

Cardiology made a clinical diagnosis of suspected myocarditis and recommended exercise restriction for 3 to 6 months, repeat ECHO, Holter monitoring, and EKG prior to returning to strenuous exercise. The patient was discharged on colchicine 0.6 mg daily for 3 months, over-the-counter ibuprofen to help manage pain, and a proton pump inhibitor for ulcer prophylaxis. The presentation and diagnosis of this case (chest pain, shortness of breath, high troponins, pericardial effusion, and no other identifiable cause of the symptoms and findings) were consistent with the case definition outlined by CDC for a probable case of acute myocarditis (Gargano et al., 2021). A two-week follow up indicated complete resolution of chest pain and mild shortness of breath on exertion.

Discussion

As of August 26, 2021, more than 2.5 million doses of COVID-19 vaccinations have been administered in the state of Mississippi, with 1.4 million individuals receiving both doses. Vaccine-related myocarditis has been confirmed in only five individuals between the ages of 15 and 18 in MS, four of which being male patients and one being a female patient. Of note, national data showed 40.6 myocarditis cases per million in males aged 12-29 years following the second vaccine dose, while the rate was significantly lower among females of the same age group – 4.2 cases per million (Gargano et al, 2021). As of June 11, 2021, of the 21.5 million second doses administered among 12-29 year-olds in the United States, 455 individuals (males comprised 89% of the total) were diagnosed with myocarditis (CDC, 2021), which translated to 0.0021%. Meanwhile, 511 out of 123,865 or 0.098% of patients aged 16 to 24, infected with COVID-19 between March 2020 and January 2021, were diagnosed with myocarditis (Boehmer et al, 2021).

CDC continues to investigate reported cases of myocarditis post COVID-19 vaccinations and found most of these individuals to have recovered completely, but the long-term effects of myopericarditis have yet to be determined. ACIP also analyzed the risk-benefit of the COVID-19 mRNA vaccines in adolescents and young adults and found that benefits (preventing COVID-19 infection and related hospitalizations/deaths) of COVID-19 vaccines outweighed risks (expected myocarditis post covid-19 vaccine dose) in all populations that the vaccinations were recommended. They also concluded that it is vital to monitor all individuals for long-term outcomes of myocarditis. Based on these conclusions and the recent full FDA approval of the

Case Report of Myopericarditis Post COVID-19 Vaccinations

Pfizer-BioNTech vaccine for individuals above the age of 16 on August 23, 2021, COVID-19 vaccinations continue to be recommended for children between the ages of 12 and 16 (based on emergency use approval) and in individuals aged 16 and above.

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Author Note

Vipina Nair, MD completed her medical internship at the Internal Medicine program at the University of Mississippi Medical Center before joining the Preventive Medicine program in July 2020. Her interests in the field of public health and preventive medicine include epidemiology of infectious and chronic diseases, lifestyle medicine focusing on disease prevention, along with social determinants of health.

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