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Myopericarditis after messenger RNA Coronavirus Disease 2019 Vaccination in Adolescents 12 to 18 Years of Age

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Objectives To characterize the clinical course and outcomes of children 12-18 years of age who developed probable myopericarditis after vaccination with the Pfizer-BioNTech (BNT162b2) coronavirus disease 2019 (COVID-19) messenger RNA (mRNA) vaccine.

Study design A cross-sectional study of 25 children, aged 12-18 years, diagnosed with probable myopericarditis after COVID-19 mRNA vaccination as per the Centers for Disease Control and Prevention criteria for myopericarditis at 8 US centers between May 10, 2021, and June 20, 2021. We retrospectively collected the following data: demographics, severe acute respiratory syndrome coronavirus 2 virus detection or serologic testing, clinical manifestations, laboratory test results, imaging study results, treatment, and time to resolutions of symptoms.

Results Most (88%) cases followed the second dose of vaccine, and chest pain (100%) was the most common presenting symptom. Patients came to medical attention a median of 2 days (range, <1-20 days) after receipt of Pfizer mRNA COVID-19 vaccination. All adolescents had an elevated plasma troponin concentration. Echocardiographic abnormalities were infrequent, and 92% showed normal cardiac function at presentation. However, cardiac magnetic resonance imaging, obtained in 16 patients (64%), revealed that 15 (94%) had late gadolinium enhancement consistent with myopericarditis. Most were treated with ibuprofen or an equivalent nonsteroidal anti-inflammatory drug for symptomatic relief. One patient was given a corticosteroid orally after the initial administration of ibuprofen or an nonsteroidal anti-inflammatory drug; 2 patients also received intravenous immune globulin. Symptom resolution was observed within 7 days in all patients.

Conclusions Our data suggest that symptoms owing to myopericarditis after the mRNA COVID-19 vaccination tend to be mild and transient. Approximately two-thirds of patients underwent cardiac magnetic resonance imaging, which revealed evidence of myocardial inflammation despite a lack of echocardiographic abnormalities. *(J Pediatr 2021;238:26-32)*.

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The US Food and Drug Administration issued an Emergency Use Authorization on December 11, 2020, for the Pfizer-BioNTech messenger RNA (mRNA) coronavirus disease 2019 (COVID-19) vaccine (BNT162b2, Pfizer-BionTech, Pfizer Inc) in individuals 16 years of age and older.[1] On May 10, 2021, the US Food and Drug Administration expanded the Emergency Use Authorization of the same vaccine to children 12-15 years of age.[2] The Centers for Disease Control and Prevention (CDC) subsequently recommended the COVID-19 vaccine for children 12 years and older via a notification issued on May 12, 2021. As of June 26, 2021, 322 million doses of various COVID-19 vaccines have been administered, of which 4 521 732 children aged 12-15 years (5% of the US population) and 3 213 339 adolescents aged 16 and 17 years (2.5% of the US

CDC	Centers for Disease Control and Prevention
CMR	Cardiac magnetic resonance imaging
COVID-19	Coronavirus disease 2019
IgG	Immunoglobulin G
mRNA	Messenger RNA
NSAID	Nonsteroidal anti-inflammatory drug
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2

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