

Myocardial injury after Pfizer m-RNA Vaccination for COVID-19: A Case Report

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ABSTRACT

Pandemic due to Sars Cov -2 coronavirus was so aggressive that for the first time the international scientific community approved the RNA vaccination for this. After the recent use of this kind of vaccines, the analysis of short- and long-term side effects of vaccines on the population are been reported. Jama and American Health Society talk about cases and report a series of probable hypersensitivity myocarditis with consistent temporal association to receipt of an mRNA COVID-19 vaccine. While the true incidence of this adverse event is unknown at this time, the presentation pattern and clinical course suggest an association with an inflammatory response to vaccination.

Herein, we report our experience about a case of myocardial injury due to hyper-inflammation after mRNA COVID-19 vaccination.

Keywords: Sars-Cov-2; Vaccination; mRNA; Myocarditis; Miocardial injury; Hyper-inflammation

Introduction

Pandemic due to Sars Cov -2 coronavirus was so aggressive that for the first time the international scientific community approved the RNA vaccination for this [1]. After the recent administration of this kind of RNA vaccines, multiple pharmacological agencies and the scientific community have started a close analysis of short- and long-term side effects of these vaccines once administered at a population level [2]. Thrombotic events after mRNA vaccinations have been reported among the most fearful side effects [3,4].

Although uncommonly reported, myocardial injury has been reported as a possible important side effect of COVID-19 vaccination [5]. This serious collateral effect has been only reported after second dose of the vaccine and the pathogenetic mechanism is still unclear. Magnetic resonance imaging (MRI) is of utmost importance for the diagnosis of myocarditis [6], but due to limited availability it cannot be certainly performed at a population level in all patients with fever and chest pain after this vaccination, but only in limited and highly suspicious cases. Herein, we report our experience on a case of myocardial injury due to hyper-inflammation after mRNA COVID-19 vaccination.

Case report

A 27-year-old girl was admitted in our department of internal medicine complaining with fever. She was an otherwise healthy

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subject, without any risk factor or any history of prior diseases. Five days after first dose vaccination with Pfizer, she complained of fever (37,5 °C) since 24 hours. Blood exams were within normal limits. White cells were 10500/mm³ (neutrophil 72%). An ECG and an echocardiogram were performed, and both turned out to be normal. A prednisone therapy was started at dose of 50 mg/daily, but after 10 days with fever that persisted despite medical therapy, an MRI was performed. MRI demonstrated a typical pattern of myocardial injury (Figure 1). Hence, we started a long term treatment by high dose of prednisone (100 mg/daily) and antibiotic therapy with levofloxacin. After 10 days of treatment (20 days after the vaccination), fever disappeared, and after 10 days more, a new cardiac MRI demonstrated normalization of the heart.

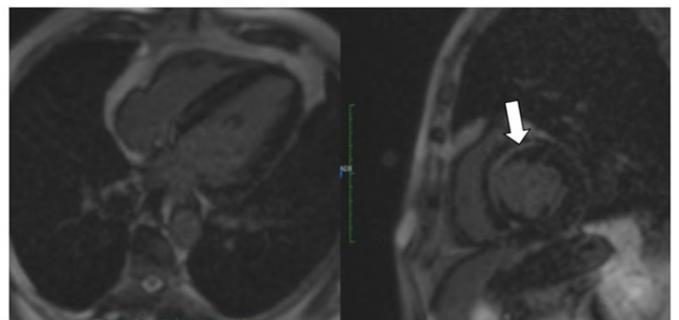


Figure 1: MRI images showing myocardial injury after first dose of COVID-19 vaccination in a 27-year-old woman. Delayed enhancement imaging was performed utilizing an SSFP sequence following the administration of Gd-based contrast agent. Four-chamber and short axis views demonstrate delayed enhancement of the septum (arrow).

Discussion

The Israeli Ministry of Health found that from December 2020 until May 2021, 148 cases of myocarditis occurred close proximity to when the patient received a vaccine dose, including 27 cases shortly after the first dose and 121 cases within 30 days of the second shot [7]. These data were reported within

a population of approximately 5049 424 people vaccinated, thus having an incidence rate of approximately 24 cases per million [7]. According to the published data, the most definitive data on myocarditis following immunization with COVID-19 mRNA vaccines will probably be provided by a large monitoring system on a large population; however, until those data will be available myocarditis after immunization with the current mRNA vaccines is to be declared rare [5,8]. Based on current evidences, however, even if a myocardial injury is possible, given the fact that the Sars Cov -2 coronavirus is mutating and becoming more aggressive even among adolescents, immunization with a vaccine should be suggested [5,8,9].

There are currently no guidelines on how to manage myocarditis patients after COVID-19 vaccination, how to follow-up these patients, or if license to physical activity can be provided. It is also unclear which kind of vaccine should be administered in those who have had myocarditis after the first dose. During these days the Advisory Committee of the Centers for Disease Control and Prevention on immunization practices has held several meetings on the epidemiology of myocarditis e pericarditis, also talking about the safety update regarding the COVID-19 vaccine. This Advisory Committee on Immunization Practices in the United States has clearly stated that an elevated risk for myocarditis among mRNA COVID-19 vaccinees has been observed, particularly in males aged 12–29 years, but the benefits of COVID-19 vaccination to individual persons and at the population level clearly outweighed the risks of myocarditis after vaccination [10]. This Advisory Committee on Immunization Practices in the United States, estimated crude reporting rates of myocarditis of 40.6 and 4.2 cases per million second doses of mRNA COVID-19 vaccines in males and females aged 12–29 years, respectively and 2.4 and 1.0 per million second doses administered in men and women aged ≥30 years, respectively [10]. Considering these worrisome data, there has been a lot of debate on the benefit-risk assessment of COVID-19 mRNA in adolescent vaccination programs [8,10].

Management of patients with suspicion of myocarditis after COVID-19 vaccination is unclear. Specifically, it is well-known that cardiac MRI should be performed in all patients with suspicion of myocarditis for diagnosis, but the current availability of MRI scanners, the expertise needed for cardiac MRI interpretation as well as the rarity of the occurrence of this side effects of COVID-19 vaccination, makes is debated how to follow-up these patients, including which cardiac imaging tests should be performed and when to perform MRI. It can be inferred that all probable cases of acute myocarditis that appear uncomplicated should perhaps require the use of cardiac MRI for a more definitive diagnosis [8]. In our case myocardial injury did not lead to any ECG or echocardiogram abnormality, and only the use of MRI showed the abnormality. In literature, there is not any notice about treatment of these patients. We performed an high dose prednisone therapy and a complete remission of the disease was observed in few weeks.

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