

Advances in Clinical and Medical Research

Genesis-ACMR-3(2)-30
Volume 3 | Issue 2
Open Access
ISSN: 2583-2778

Relationship between COVID-19 Vaccine and Myocarditis

Shihori Tanabe*

Division of Risk Assessment, Center for Biological Safety and Research, National Institute of Health Sciences, Kawasaki 210-9501, Japan

***Corresponding author:** Shihori Tanabe, Division of Risk Assessment, Center for Biological Safety and Research, National Institute of Health Sciences, Kawasaki 210-9501, Japan

Citation: Tanabe S. (2022) Relationship between COVID-19 Vaccine and Myocarditis. *Adv Clin Med Res.* 3(2):1-3.

Received: June 05, 2022 | **Published:** June 23, 2022

Copyright © 2022 by Tanabe S. All rights reserved. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Several adverse events of COVID-19 vaccines have been reported, which includes myocarditis. COVID-19 vaccines include mRNA vaccines and genetically-modified protein vaccines, and plasmid vaccines. The myocarditis after the COVID-19 mRNA vaccination in males has been reported, which turned out to be mild symptoms in most cases. The relationship between COVID-19 mRNA vaccines and myocarditis is described in this Editorial.

Keywords

Covid-19; Myocarditis; mRNA vaccines; Proinflammatory cascades

Relationship between COVID-19 vaccines and myocarditis

COVID-19 vaccines include messenger RNA (mRNA) vaccines, where myocarditis in male teenagers emerged as a possible rare adverse event [1]. Myocarditis is usually defined as an inflammatory disorder of the heart muscle, while the diagnosis of myocarditis is challenging [1]. A retrospective case series has reported that the increased incidence rate ratio of COVID-19-related myocarditis was observed among adult males compared with females [2]. The majority of the cases occurred within 3 days following the second dose of the vaccine, which showed mild symptoms and all patients survived [2]. Several events of myocarditis have occurred after the second dose of mRNA vaccine for COVID-19 in adolescent males, where the mechanism is still unknown [3]. A study on the myocarditis and COVID-19 vaccine demonstrated that myocarditis related to COVID-19 vaccines mostly occurs in young male individuals with mRNA vaccines, while clinical symptoms resolved within 6 days with preservation of the cardiac function in all reported cases [4]. A survey of clinical records of 2000287 vaccine recipients revealed that myocarditis occurred a median of 3.5 days after vaccination and no death was observed [5].

A case report of a 24-year-old male patient who was diagnosed with myocarditis after receiving the COVID-19 mRNA vaccine demonstrated that the patient recovered after 4 days of hospitalization [6]. A report on six cases of myocarditis after COVID-19 mRNA vaccination showed that five patients presented the myocarditis after the second dose of the vaccine and all patients were males with a median age of 23 years [7]. The clinical course was mild in all six cases reported [7]. Careful vigilance is needed for COVID-19 mRNA vaccines since the rare risk for myocarditis involves in young male adults [8]. Reporting system such as Vaccine Adverse Event Reporting System (<https://vaers.hhs.gov/faq.html>) has been utilized for the assessment of the COVID-19 vaccination [9]. It has been concluded that the benefits of COVID-19 vaccination to individual persons and at the population level clearly outweighed the risks of myocarditis after vaccination [9]. The immune response to mRNA may result in the activation of proinflammatory cascades and immunologic pathways leading to the development of myocarditis [10]. A benefit-risk assessment for COVID-19 vaccination suggested a favorable balance for all age and sex groups, which recommends the vaccination for those over 12 years of age [10]. In conclusion, myocarditis occurred after the COVID-19 mRNA vaccination in young male adults. The mechanism of the myocarditis in regard to the immune reaction may be worth investigating in the future.

Acknowledgements

This work was supported by Japan Agency for Medical Research and Development (AMED), Grant Number JP21mk0101216, JP22mk0101216, JSPS KAKENHI Grant Number 21K12133, and Ministry of Health, Labour, and Welfare (MHLW). The author would like to thank all collaborators.

References

1. Caforio ALP. (2021) Receipt of mRNA Vaccine against Covid-19 and Myocarditis. *N Engl J Med*. 385(23):2189-190.
2. Perez Y, Levy ER, Joshi AY, Virk A, Rodriguez-Porcel M, et al. (2021) Myocarditis Following COVID-19 mRNA Vaccine: A Case Series and Incidence Rate Determination. *Clin Infect Dis* 2021.
3. Calcaterra G, Mehta JL, de Gregorio C, Butera G, Neroni P, et al. (2021) COVID 19 Vaccine for Adolescents. Concern about Myocarditis and Pericarditis. *Pediatr Rep*. 13(3):530-33.
4. Salah HM, Mehta JL. (2021) COVID-19 Vaccine and Myocarditis. *Am J Cardiol*. 157:146-48.

5. Diaz GA, Parsons GT, Gering SK, Meier AR, Hutchinson IV, et al. (2021) Myocarditis and Pericarditis After Vaccination for COVID-19. *JAMA*. 326(12):1210-12.
6. Singh B, Kaur P, Cedeno L, Brahimi T, Patel P, et al. (2021) COVID-19 mRNA Vaccine and Myocarditis. *Eur J Case Rep Intern Med*. 8:002681.
7. Abu Mouch S, Roguin A, Hellou E, Ishai A, Shoshan U, et al. (2021) Myocarditis following COVID-19 mRNA vaccination. *Vaccine*. 3790-93.
8. Pepe S, Gregory AT, Denniss AR. (2021) Myocarditis, Pericarditis and Cardiomyopathy After COVID-19 Vaccination. *Heart Lung Circ*. 30(10):1425-29.
9. Gargano JW, Wallace M, Hadler SC, Langley G, Su JR, et al. (2021) Use of mRNA COVID-19 Vaccine After Reports of Myocarditis Among Vaccine Recipients: Update from the Advisory Committee on Immunization Practices - United States, June 2021. *MMWR Morb Mortal Wkly Rep*. 70:977-82.
10. Bozkurt B, Kamat I, Hotez PJ. (2021) Myocarditis With COVID-19 mRNA Vaccines. *Circulation*. 144(6):471-84.