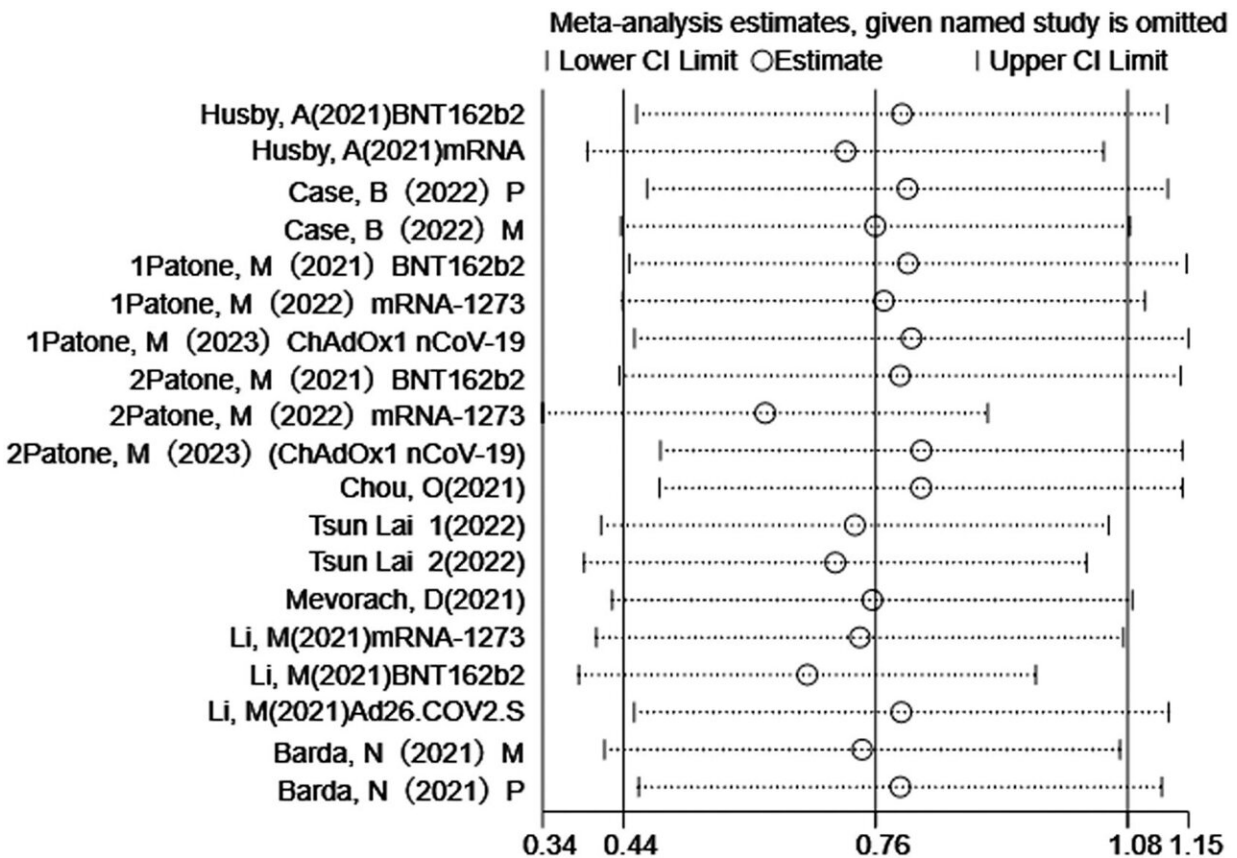


Getting to the heart of COVID-19 vaccination and its cardiovascular risks

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Sensitivity analysis on COVID-19 vaccination and the risk of myocarditis or pericarditis. Credit: *American Journal of Preventive Medicine* (2022). DOI: 10.1016/j.amepre.2022.09.002

A comprehensive review and meta-analysis of published research

confirm that young adults (40 years old and younger) have a slightly elevated risk for myocarditis or pericarditis after mRNA COVID-19 vaccination. The analysis is reported in a new study in the *American Journal of Preventive Medicine*.

"Our study analyzes data to identify who might be at high risk for myocarditis/pericarditis after COVID-19 vaccination and validates the rare adverse reaction in adults under 40," explained lead investigator Chenyu Sun, MD, MSc, AMITA Health Saint Joseph Hospital Chicago, Chicago, IL, U.S..

Key findings include:

- A second [vaccine](#) dose is associated with a greater risk of the cardiovascular reaction than the first dose.
- The increased risk is only associated with mRNA (e.g., mRNA-1273 and BNT162b2—the latter linked to a slightly lower risk than the former), but not other [vaccine](#) types (e.g., Corona-Vac.).
- While males are more likely to develop myocarditis/pericarditis (established by research prior to the pandemic), female susceptibility increases after the COVID-19 vaccine.
- The incidence of myocarditis/pericarditis for those infected with SARS-CoV-2 is higher than it is after vaccination.

Myocarditis is an inflammation of the cardiac muscle that may present with chest pain, fever, [congestive heart failure](#), or arrhythmias and can lead to death. Pericarditis generally causes severe [chest pain](#) behind the sternum. Both are believed to result from autoinflammation and be related to the immune response to viral infection.

Dr. Sun pointed out, "When myocarditis or pericarditis develop after a COVID-19 vaccination, the symptoms are usually less severe and largely

self-remitting compared with other cases. As a clinician, I strongly recommend that people get a COVID 19 vaccine unless there are absolute contraindications such as known allergies. The benefits and harms must be carefully assessed to determine the best management option for patients who are in the high risk-group."

Concerns about this rare but dangerous adverse reaction have caused confusion for both the [general public](#) and healthcare providers.

"By exploring the relationship between COVID-19 vaccine and myocarditis/pericarditis through systemic review and meta-analysis, we hope to clarify the risks and help healthcare providers and public health policy makers to provide a safer vaccination strategy for high-risk groups," added co-investigator Linya Feng, MPH, Department of Epidemiology and Health Statistics, School of Public Health, Anhui Medical University, Hefei, China.

"Vaccination is one of the most important measures we have in the fight against COVID-19. Different strategies of different doses or different types of COVID-19 vaccine can be adopted according to the characteristics of the population."

The study also explores several pathogenic mechanisms of the association between COVID-19 vaccination and myocarditis/pericarditis, the exact etiology of which remains uncertain. First author Juan Gao, MMS, Department of Epidemiology and Health Statistics, School of Public Health, Anhui Medical University, Hefei, China, commented, "I hope more studies can be done to explore adverse events after vaccination, so [healthcare providers](#) and public health professionals can be guided with even better evidence."

The comprehensive literature search identified 1,123 relevant published papers. Of these the investigators selected 11 studies on COVID-19

vaccination and the risk of myocarditis or pericarditis that met their rigorous criteria; eight of them compared the incidence of myocarditis or pericarditis before and after COVID-19 vaccination and three analyzed the effect of different doses of vaccination on the incidence of myocarditis or pericarditis.

Based on data on more than 58 million participants in these studies, the investigators analyzed the effects of different sexes, ages, regions, vaccination types, and doses on the risk of myocarditis or pericarditis.

More than 300 SARS-CoV-2 vaccines have been developed and 169 are currently in clinical trials.

More information: Juan Gao et al, A Systematic Review and Meta-analysis of the Association Between SARS-CoV-2 Vaccination and Myocarditis or Pericarditis, *American Journal of Preventive Medicine* (2022). [DOI: 10.1016/j.amepre.2022.09.002](https://doi.org/10.1016/j.amepre.2022.09.002)

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