NEWS RELEASE
FOR IMMEDIATE RELEASE

Media contact:
Jillian B. Morgan, MPH, Managing Editor
AJPM
+1 734 936 1590
ajpmmedia@elsevier.com

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

After mRNA vaccination, adults under 40 have a slightly greater chance of developing myocarditis or pericarditis, yet the vaccine’s benefits outweigh the risks, according to the American Journal of Preventive Medicine

Ann Arbor, November 1, 2022 – 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, published by Elsevier.

“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, USA.

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. 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,” added co-investigator Linya Feng, MPH, Department of Epidemiology and Health Statistics, School of Public Health, Anhui Medical University, Hefei, China.

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.

---

Notes for editors
The article is "A Systematic Review and Meta-analysis of the Association Between SARS-CoV-2 Vaccination and Myocarditis or Pericarditis," by Juan Gao, MMS, Linya Feng, MPH, Yaru Li, DO, Scott Lowe, BS, Zhichun Guo, PharmD, Rachel Bentley, MS, Chuman Xie, PharmD, Biron Wu, MMS, Peng Xie, MMS, Weihang Xia, MMS, Shaodi Ma, MD, Haixia Liu, MD, Xianwei Guo, MMS, John Patrick N. Uy, MD, Qin Zhou, PhD, Hina Wazir, MD, and Chenyu Sun, MD, MSc (https://doi.org/10.1016/j.amepre.2022.09.002). It appears online in advance of the American Journal of Preventive Medicine, volume 64, issue 2 (February 2023), published by Elsevier.

The article is openly available at https://www.ajpmonline.org/article/S0749-3797(22)00453-6/fulltext.

Full text of this article is also available to credentialed journalists upon request; contact Jillian B. Morgan at +1 734 936 1590 or ajpmmedia@elsevier.com. Journalists wishing to interview the authors should contact Chenyu Sun, MD, MSc, at drsunchenyu@yeah.net.

Elsevier's Novel Coronavirus Information Center provides expert-curated information for researchers, healthcare professionals and public health officials, including clinical guidance and a portal to access all of Elsevier's COVID-19 research. All resources are freely available. We also have dedicated hubs for healthcare professionals; health educators and students; librarians; and R&D professionals. You can find these in our Coronavirus Resource Directory, www.elsevier.com/connect/coronavirus-information-center

About the American Journal of Preventive Medicine
The American Journal of Preventive Medicine is the official journal of the American College of Preventive Medicine and the Association for Prevention Teaching and Research. It publishes articles in the areas of prevention research, teaching, practice and policy. Original research is published on interventions aimed at the prevention of chronic and acute disease and the promotion of individual and community health. The journal features papers that address the primary and secondary prevention of important clinical, behavioral and public health issues such as injury and violence, infectious disease, women's health, smoking, sedentary behaviors and physical activity, nutrition, diabetes, obesity, and alcohol and drug abuse. Papers also address educational initiatives aimed at improving the ability of health professionals to provide effective clinical prevention and public health services. The journal also publishes official policy statements from the two co-sponsoring organizations, health services research pertinent to prevention and public health, review articles, media reviews, and editorials. www.ajpmonline.org
About Elsevier
As a global leader in information and analytics, Elsevier helps researchers and healthcare professionals advance science and improve health outcomes for the benefit of society. We do this by facilitating insights and critical decision-making for customers across the global research and health ecosystems.

In everything we publish, we uphold the highest standards of quality and integrity. We bring that same rigor to our information analytics solutions for researchers, health professionals, institutions and funders.

Elsevier employs 8,700 people worldwide. We have supported the work of our research and health partners for more than 140 years. Growing from our roots in publishing, we offer knowledge and valuable analytics that help our users make breakthroughs and drive societal progress. Digital solutions such as ScienceDirect, Scopus, SciVal, ClinicalKey and Sherpath support strategic research management, R&D performance, clinical decision support, and health education. Researchers and healthcare professionals rely on our over 2,700 digitized journals, including The Lancet and Cell; our over 43,000 eBook titles; and our iconic reference works, such as Gray's Anatomy. With the Elsevier Foundation and our external Inclusion & Diversity Advisory Board, we work in partnership with diverse stakeholders to advance inclusion and diversity in science, research and healthcare in developing countries and around the world.

Elsevier is part of RELX, a global provider of information-based analytics and decision tools for professional and business customers. www.elsevier.com