Myocarditis after COVID-19: Comparing risks from vaccination and infection

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An inflammation of the heart muscle is called myocarditis. COVID-19 mRNA vaccine related myocarditis has drawn a considerable amount of attention in public. Fear of complications post-vaccination is a key obstacle in vaccine uptake. Therefore, it is crucial to put these concerns to contextualise of extensive clinical data.

A meta-analysis by Voleti et al reported that relative risk of getting myocarditis in patients with covid-19 related infection was seven times more than the group with mRNA covid vaccines.[1] The U.S. food and drug administration in their 2025 updated reported that myocarditis was reported to be approximately eight cases per million doses in individuals aged 6 months to 64 years and the number rose to 27 per million doses in males aged 12 to 24 years.[2] A study conducted from March 2020 to January 2021 reported that the risk of getting myocarditis in covid-19 patients was 16 times higher than those without infection.[3] A study by Shay et al (2021) reported that myocarditis associated with vaccine typically presented as mild, was rarely associated with deaths, and was responsive to non-steroidal anti-inflammatory drugs (NSAIDs).[4] Patone et al (2022) reported contrasting presentation of myocarditis associated with covid-19 infection, this type of infection more frequently led to ventricular dysfunction, arrhythmias and fatalities.[5] Semenzato et al (2024) conducted a countrywide cohort study in France which reported less severe cardiovascular events after 18 months of follow up in post-vaccinationmyocarditis compared to myocarditis of other origins.[6]

The disparity in incidence and outcomes severity strongly suggest that the benefits of COVID-19 mRNA vaccine outweigh the risks. Considering these findings, we recommend that the public should be informed regarding the risks of COVID-19 infection related myocarditis, which poses a greater threat as compared to COVID-19 mRNA vaccine associated myocarditis. We recommend that high risk groups should be identified, and alternate formulations or dosing intervals should be used for the high-risk group. More extensive randomised trials and continuous monitoring of vaccinated people should continue to refine our understanding of vaccine and infection related complications.

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