


Editorial for “Cardiac Magnetic Resonance Imaging Findings in COVID-19 Vaccine-Related Myocarditis: A Pooled Analysis of 468 Patients”

Samimisedeh et al,¹ have published a systematic review and meta-analysis of 102 publications with 468 patients with suspected myocarditis following COVID-19 vaccination. An accompanying editorial by Hanneman et al,² highlights how patients were predominately young, male, and affected after their second dose of vaccine. A total of 79% met the accepted Lake Louise criteria for myocarditis. The authors show that the overall rate of myocarditis is low, ~16 cases per million doses of vaccine, and comparable to other vaccines such as influenza and non-smallpox vaccines.³ The authors can be applauded for demonstrating in a large, pooled cohort that vaccine-related myocarditis is usually mild and self-limiting, with no deaths occurring within the time frame. This provides substantial evidence for clinicians in their counseling of patients with vaccine hesitancy, particularly a younger population who as less likely to develop severe disease.

This is in stark contrast to myocarditis related to the COVID-19 virus itself, which portends a poor prognosis due to arrhythmias, heart failure and death. One study has shown a 0.2% chance of arrhythmias or death within 28 days of a COVID vaccine, compared with 10.3% after a positive COVID test. In another large registry study of COVID-19 positive patients, those with myocarditis compared with those without myocarditis had a mortality rate of 13.4% vs. 4.2%.⁴

There is evidence cardiac MRI follow-up has prognostic value after an acute diagnosis of myocarditis, with patients with late gadolinium enhancement having complete resolution on a 6-month convalescent scan.^{5,6} Early signal in published reports of vaccine-related myocarditis first appeared in mid-2021.⁷ Therefore, it would have been interesting to review that papers that include 6 to 12 month follow up cardiac MRI studies of cases to see if the degree of late gadolinium enhancement improved or resolved, particularly as it is a self-limiting disease clinically.

Cardiac magnetic resonance imaging is non-invasive and excellent investigative tool in diagnosis myocarditis.⁶ Though cardiac MRI can demonstrate the classic subepicardial basal to mid inferolateral wall late gadolinium enhancement pattern, it does not have enough precision to identify the underlying etiology. Moreover, despite extensive research into vaccine-related myocarditis, we are still unclear as to the exact mechanisms that cause it.^{8,9} It would have been interesting to review the studies that included histopathological correlation with endomyocardial biopsy. Finally, there is an emerging signal that myocarditis may represent an early signal of a “hot phase” of inherited or inflammatory cardiomyopathies, and that patients may have a genetic disposition to develop myocarditis.¹⁰ This could have been an interesting additional question in this review and will be interesting to follow in the coming years as we learn about the long-term effects of COVID-19 and vaccines to mitigate the risks.

Nicole K. Bart, MBBS, BSc (Med Sci), DPhil 

Heart Transplant Unit, St Vincent’s Hospital, Darlinghurst, New South Wales, Australia

School of Medicine, University of Notre Dame, Notre Dame, Indiana, USA

School of Medicine, University of New South Wales, Sydney, New South Wales, Australia

Victor Chang Cardiac Research Institute, Darlinghurst, New South Wales, Australia

E-mail: nicole.bart@svha.org.au

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Evidence Level: 1

Technical Efficacy: Stage 5