A multiprovincial analysis of the incidence of myocarditis or pericarditis after mRNA vaccination by varying dosing intervals, compared to the incidence after SARS-CoV-2 infection: a Canadian Immunization Research Network (CIRN) study

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Introduction

Post-marketing surveillance systems and epidemiological studies have linked Myocarditis and Pericarditis, to mRNA COVID-19 vaccines. Little research is available on the difference in post-vaccination myocarditis/pericarditis risk by product type and varying dose intervals. Furthermore, COVID-19 infection is also associated with myocarditis/pericarditis.19 However, there has been debate with respect to risk of myocarditis following infection vs vaccination.

Objective

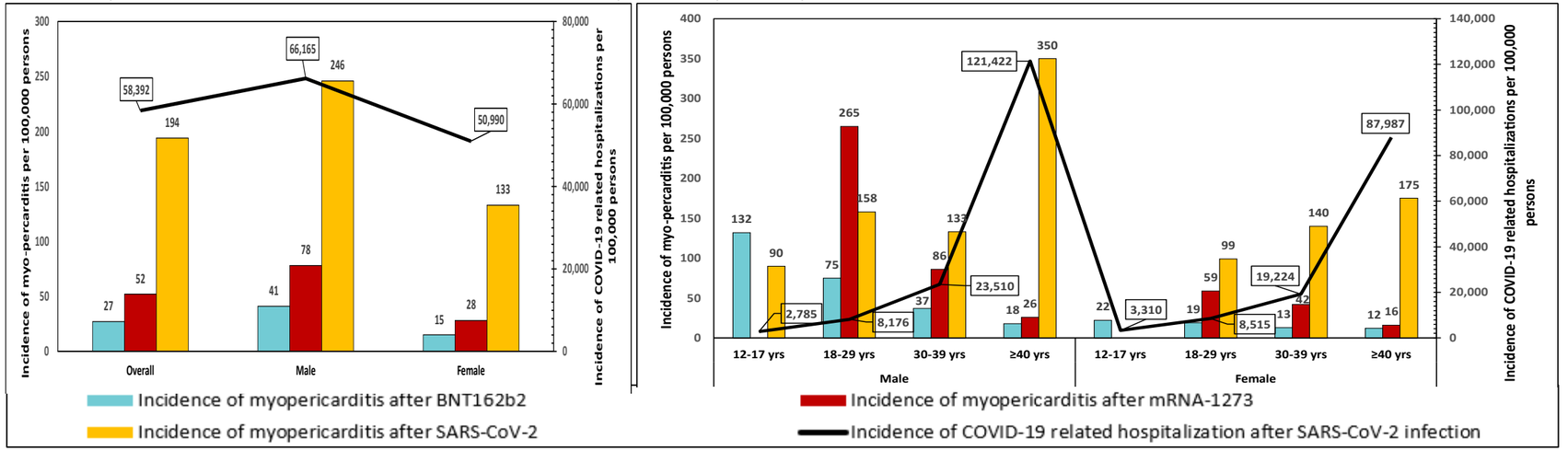
To compare the risk of myocarditis/pericarditis after COVID-19 mRNA vaccination versus confirmed SARS-CoV-2 infection, and to assess if the risk of myocarditis/pericarditis varies by vaccine dosing interval

Methods

- A population-based retrospective cohort study using linked provincial databases in Quebec, Ontario, and British Columbia.
- Individuals aged ≥12 years who received an mRNA vaccine as the second dose (vaccination cohort) or those who tested positive for SARS-CoV-2 by RT-PCR (infection cohort).
- Primary outcome: An incident hospitalization or emergency department visit with a diagnosis of myocarditis or pericarditis within 21 days of an exposure.
- Age and sex-stratified incidence ratios (IRs) of myocarditis/pericarditis following mRNA vaccination versus SARS-CoV-2 infection were calculated.
- Post-vaccination incidence of myocarditis/pericarditis by vaccine type and dosing intervals were calculated.
- Province-specific estimates were pooled in a one-stage meta-analysis using the Poisson likelihood within provinces and allowing for random-effects on the province-specific effects.

Results

Figure. Incidence of hospitalizations for COVID-19 within 21 days following a laboratory-confirmed SARS-CoV-2 infection compared to incidence of hospitalizations or emergency department visits for myocarditis or pericarditis within 21 days following a laboratory-confirmed SARS-CoV-2 infection or receipt of BNT162b2 (Pfizer-BioNTech Comirnaty) or mRNA-1273 (Moderna SpikeVax) as the second COVID-19 vaccine dose in 3 Canadian provinces, up to 30 September 2021



- The overall incidence of myocarditis/pericarditis was lower with longer dosing intervals.
- Irrespective of the vaccine schedule, the adjusted incidence of myocarditis/pericarditis was lower for individuals with longer dosing intervals.

Conclusions

- The risk of myocarditis/pericarditis is lower after mRNA vaccination than after SARS-CoV-2 infection and is lower with longer intervals between primary doses of mRNA vaccines than shorter intervals.
- The study findings support the continued use of the mRNA COVID-19 vaccines as per NACI recommendations of a longer interval (an 8-week or at least 8 weeks) between the two doses of primary series and preferential use of BNT162b2 in those younger than 30 years.

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