

Cardiology and COVID-19

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The three COVID 'peaks' in cardiology

1. The ACEi and ARB issue
2. COVID-related cardiac disease: myopericarditis, ACS.
3. mRNA ('Pfizer') vaccine induced myocarditis and /or pericarditis

Tips and Tricks re Covid

- ▶ Inpatient course
- ▶ Protection at your practice
- ▶ Vaccine and boosters

ACEI and ARB

- ▶ These medications cause up-regulation membrane-bound ACE2 in rodents
- ▶ COVID-19 spike protein binds to ACE2 for cell entry
- ▶ No evidence to support increased risk of infection or severity of infection for patients on these agents. They do not need to be ceased in patients with COVID.

COVID-related Myocarditis

Bottom line: COVID-19 causes myocarditis. The prevalence, especially based on clinical symptoms is low: maybe 20 to 450 per million. However, there appears to be a predilection for young males and considering the high prevalence of COVID in the community, there is a potential for a high number of young men to have myocardial scarring following a sub-clinical infection. 2% of young males had CMR evidence of myocarditis on CMR . Fewer had symptoms

Vaccine related myocarditis

ORIGINAL ARTICLE

Safety of the BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Setting

Noam Barda, M.D., Noa Dagan, M.D., Yatir Ben-Shlomo, B.Sc., Eldad Kepten, Ph.D., Jacob Waxman, M.D., Reut Ohana, M.Sc., Miguel A. Hernán, M.D., Marc Lipsitch, D.Phil., Isaac Kohane, M.D., Doron Netzer, M.D., Ben Y. Reis, Ph.D., and Ran D. Balicer, M.D.

Vaccine related myocarditis

- ▶ First large cohort study NEJM, May 2021
- ▶ Israeli study, 880 000 vaccinated v 880 000 unvaccinated patients.
- ▶ This study reported the rate of myocarditis in infected patients
- ▶ Vaccine complications compared to rate in unvaccinated and infected patients.
 - ▶ Compared to the unvaccinated, vaccinated patients had a higher rate ratio of myocarditis: 3.24; RD 2.7/100 000 (total n = 21 v 6)
 - ▶ Infected patients had a higher rate of myocarditis than vaccinated patients: RR 18.28; RD 11/100 000

ORIGINAL ARTICLE

Myocarditis after Covid-19 Vaccination in a Large Health Care Organization

Guy Witberg, M.D., Noam Barda, M.D., Ph.D., Sara Hoss, M.D.,
Ilan Richter, M.D., M.P.H., Maya Wiessman, M.D., Yaron Aviv, M.D.,
Tzlil Grinberg, M.D., Oren Auster, M.Sc., Noa Dagan, M.D., Ph.D., M.P.H.,
Ran D. Balicer, M.D., Ph.D., M.P.H., and Ran Kornowski, M.D.

Published October 6

2.5 million vaccinated patients; *at least one dose of vaccine.*

54 cases of myocarditis.

Incidence: 2.13/100 000

10.7/100 000 in males 16-29 years

Most cases are mild. Cases with myocardial dysfunction normalised
in ~25 days*

ORIGINAL ARTICLE

Myocarditis after BNT162b2 mRNA Vaccine against Covid-19 in Israel

D. Mevorach, E. Anis, N. Cedar, M. Bromberg, E.J. Haas, E. Nadir, S. Olsha-Castell, D. Arad, T. Hasin, N. Levi, R. Asleh, O. Amir, K. Meir, D. Cohen, R. Dichtiar, D. Novick, Y. Hershkovitz, R. Dagan, I. Leitersdorf, R. Ben-Ami, I. Miskin, W. Saliba, K. Muhsen, Y. Levi, M.S. Green, L. Keinan-Boker, and S. Alroy-Preis

Published October 6; data from Israel's Ministry of Health
Over 10 million doses
136 cases of myocarditis
95% of cases were mild
1 death from fulminant myocarditis
The incidence of myocarditis increased after vaccination,
especially in men 16-29 years.

Results

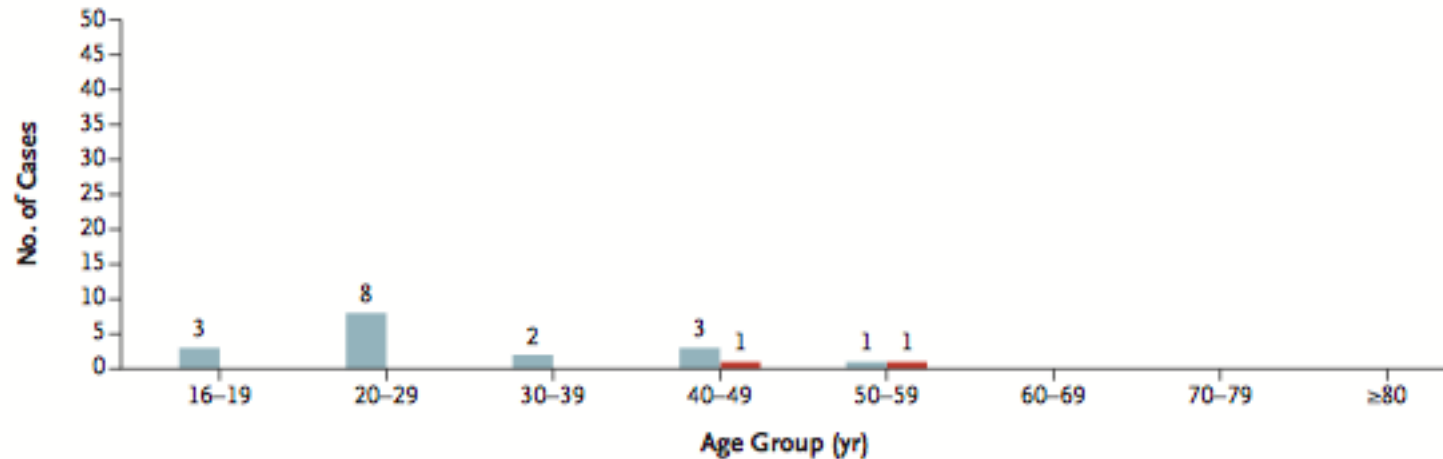
- ▶ 304 cases
- ▶ 142 met criteria for vaccine related myocarditis
 - ▶ Myocarditis within 21 days of first vaccine or 30 days of second vaccine
- ▶ **136** had definite or probable myocarditis
- ▶ 129 mild case; 1 fulminant causing death
- ▶ LVEF normal or mildly impaired in all but 4 cases
- ▶ 19 presented after vaccine 1
- ▶ 117 presented after vaccine 2
- ▶ 91% male; 76% under 30 years. Data on age and sex only available for 95/136 cases

Incidence of myocarditis after first and second vaccine doses

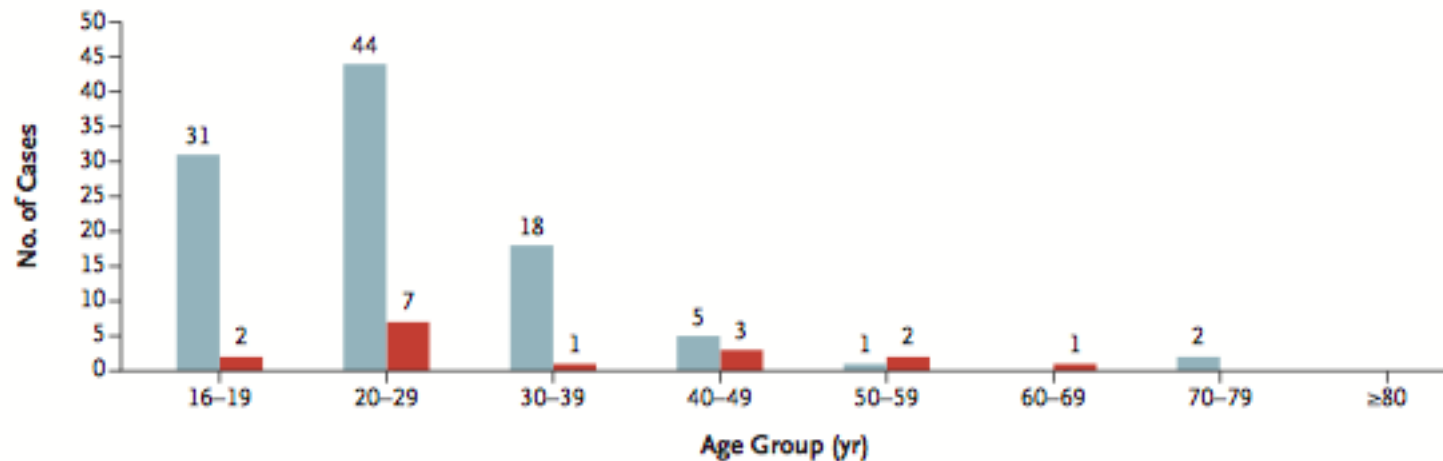
- ▶ Overall risk difference for all cases 1.76/100 000
- ▶ Risk difference among males 3.19/100 000
- ▶ Risk difference among females 0.39/100 000
- ▶ **First 7 days after the second vaccine is the highest risk period**

Incidence of myocarditis after first and second vaccine doses

C Distribution of 19 Cases of Myocarditis after First Vaccine Dose, According to Age and Sex



D Distribution of 117 Cases of Myocarditis after Second Vaccine Dose, According to Age and Sex



Conclusions re myocarditis

- ▶ Increased risk of myocarditis after mRNA vaccine, especially in males aged 16-29 years (younger is higher risk)
- ▶ Total numbers are low.
 - ▶ 1 in 6637 males aged 16-19; 1 in 99 853 females aged 16-19 years.
 - ▶ 1 in 26 000 males; 1 in 218 000 females
- ▶ The risk is mainly within 7 days of the second dose of vaccine
- ▶ This is likely less than the myocarditis risk from COVID infection
- ▶ Myocarditis after vaccination is usually mild, with a complete recovery in patients who attended follow-up

Pericarditis

- ▶ Easier to diagnose
- ▶ More common than myocarditis after vaccination
- ▶ Still uncommon
- ▶ Usually benign course

Covid inpatient course

- ▶ About 1 in 10 need admission
- ▶ 1 in 7 of these get sick day 5 to 8, generally desaturation and respiratory failure
- ▶ 1 in 3 of these need ventilation, the rest NIV or high flow oxygen
- ▶ Most deaths are from respiratory failure , or from arterial or venous vascular events in those predisposed, not myocarditis
- ▶ Everyone gets enoxaparin once or twice a day
- ▶ Oxygen, prone nursing and dexamethasone are effective

Covid outpatient course

- ▶ The key is the O2 saturation
- ▶ Prophylactic DOACs don't work
- ▶ N95 mask (properly fitted) and a set of goggles will protect you and your staff
- ▶ The NSW Health Risk Assessment Matrix is very helpful

The Vaccines

- ▶ Reduce risk of contracting Covid
- ▶ Reduce risk of serious disease and long Covid
- ▶ Reduce risk of transmission.
- ▶ Probably heading for over 90% double vaccination status; perhaps 95% with Novartis vaccine
- ▶ Timing and availability of booster still a work in progress, but will be necessary.

THE END

THANKS FOR YOUR ATTENTION

QUESTIONS FOR ALL THE
SPEAKERS