

### COVID-19 vaccination in the pediatric age and risk for myocarditis

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**Background:** There are some concerns about the cost/benefit ratio of Covid-19 vaccination in children and young adolescents age due to the greater response to immune stimulation. Myocarditis is a feared adverse event (AE).

**Methods:** On January 4, 2022 we searched the Pubmed and EMBASE datasets for population studies assessing myocarditis events in pediatric subjects, and US nationwide data about COVID-19 vaccinations and AEs.

**Results:** The studies selected (n=10) were highly heterogeneous, and did not include subjects <12 years. The estimated incidence of myocarditis in the US was 2.80 over 100,000 in fully vaccinated individuals (i.e., receiving two doses of mRNA vaccines or received one dose of a single-dose vaccine) aged 6–17 years. No events were reported <5 years (n=9,985).

The incidence of myocarditis was 1.05 over 100,000 in those aged 18–64 years, and 2.75 over 1,000,000 ≥65 years. The incidence of fatal or life-threatening myocarditis was 3.78 over 1,000,000 6–17 years, 1.78 over 1,000,000 18–64 years, and 8.54 over 10,000,000 ≥65 years, with the same order of magnitude than the odds of being struck by lightning. The incidence of COVID-19 myocarditis is 1.33 in 1000 <16 years, i.e., 47.5-fold higher than fully vaccinated individuals.

**Conclusions:** The reported incidence of myocarditis in subjects aged ≥12 years is slightly higher in males and after the second dose, but extremely low. No case of myocarditis <5 years were reported in the US. In fully vaccinated individuals aged 6–17 years, the estimated incidence of myocarditis was far lower than the risk of COVID-19 myocarditis.

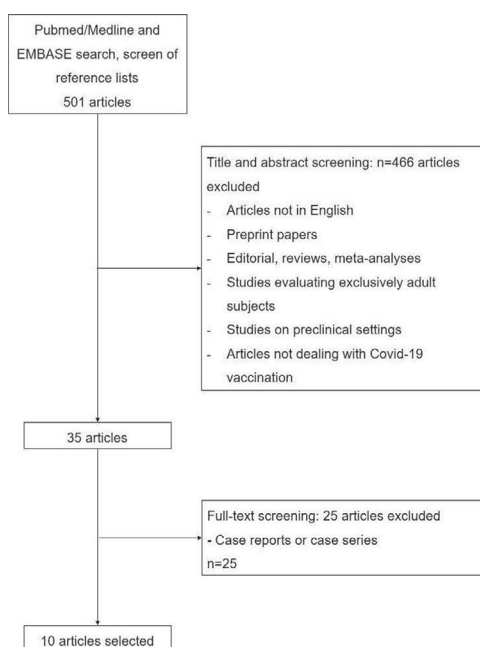


Figure 1

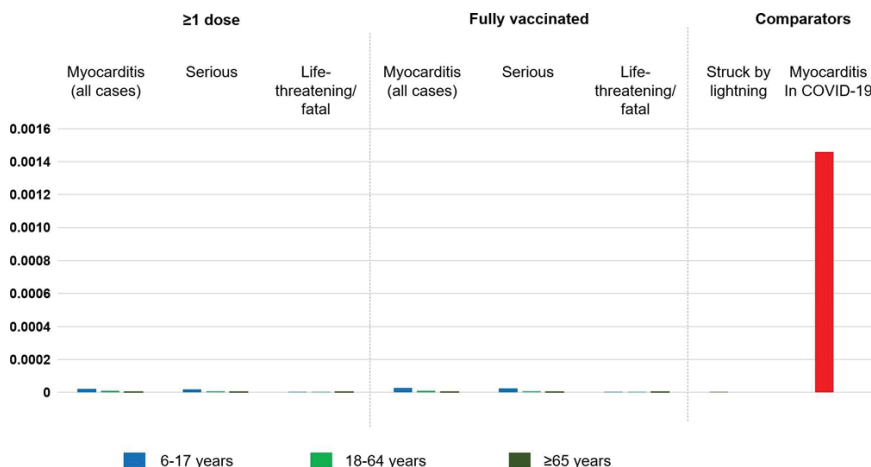


Figure 2