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Covid vaccines are not linked to sudden death in healthy younger adults, study finds

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Covid-19 vaccines do not increase the risk of sudden cardiac death in younger healthy adults, a study in Canada has concluded.[1]

The case-control study included nearly 6.4 million residents in Ontario aged 12-50 years and without any documented comorbidities that would have predisposed them to premature death, such as cardiovascular disease, diabetes, or cancer.

From 1 April 2021 to 30 June 2023, 4963 (0.08%) people died suddenly, the median age of this group was 36, and 74.4% were male.

To meet the criteria of a sudden death, fatalities had to occur out of hospital, in an emergency department, or in hospital within 24 hours of admission, with a diagnosis of cardiac arrest, sudden death, or significant ventricular arrhythmia and without factors such as trauma, mental illness, or substance misuse.

Of the 4963 total, 4448 (89.6%) of the patients died in the prehospital setting and 515 (10.4%) died within a day of presenting to hospital or an emergency department.

The Toronto based researchers then matched each person in a cohort of 4806 (96.8%) of the cases to five living control participants on the basis of age, sex, region of residence, and neighbourhood income, giving a total of 24 030 controls.

The researchers found no increased rate of sudden death in people within six weeks of receiving their first, second, or third covid vaccine dose. In fact, people vaccinated against covid-19 were 43% less likely to experience sudden death than unvaccinated people (adjusted odds ratio 0.57 (95% confidence interval 0.53 to 0.61); P<0.001).

Most of the people in the study received the Pfizer-BioNTech vaccine, with smaller numbers getting the Moderna and AstraZeneca vaccines. However, the researchers did not observe a higher risk of death in people who received any covid-19 vaccine.

The researchers said that a strength of their study was its large, population based cohort of residents covered by a universal, single payer healthcare system. But they acknowledged that a major limitation was that they could not confirm the underlying cause of deaths that occurred out of hospital. So, any deaths out of hospital that were due to car crashes, violence, or suicides could not be excluded.

Reassurance

The study was published in the open access journal *PLOS Medicine* and funded by the Public Health Agency of Canada and the Canadian Institutes of Health.

Peter Openshaw, professor of experimental medicine at Imperial College London, UK, told *The BMJ*, "It's a large and well designed study that supports the safety of the covid vaccines in respect to sudden death in young and middle aged adults."

Azeem Majeed, professor of primary care and public health at Imperial College London, also said that it was a "well designed study that addresses a question of significant public interest." He told *The BMJ*, "The findings provide reassurance that covid-19 vaccination is not associated with an increased risk of sudden cardiac death in healthy young adults.

"The use of a self-controlled case series design is a particular strength, as it helps control for individual level confounding by comparing a person's risk during postvaccination periods with their own baseline risk during non-exposed periods."

Majeed said that, as with any registry based study, there were some limitations, including the potential for residual confounding. "However, these do not undermine the central conclusion that the benefits of vaccination in preventing severe illness and long term health consequences outweigh the very small risks of serious adverse cardiac events," he said, adding that covid-19 infection itself was a well established risk factor for serious cardiovascular complications.

The mRNA covid vaccine made by Pfizer-BioNtech has been associated with an increased risk of myocarditis in the month after vaccination.[2] However, a large study published last year in *Lancet Child & Adolescent Health* found that young people's risk of developing myocarditis was higher and longer lasting after covid-19 infection than after vaccination against it.[3]

1 Abdel-Qadir H, Bhatt H, Swayze S, et al. Association between covid-19 vaccination and sudden death in apparently healthy younger individuals: a population-based case-control study. *PLOS Med* 2026 (published online 19 Mar). doi: 10.1371/journal.pmed.1004924

2 Barda N, Dagan N, Ben-Shlomo Y, etal. Safety of the BNT162b2 RNA covid-19 vaccine in a nationwide setting. *N Engl J Med* 2021;385:-90. doi: 10.1056/NEJMoa2110475. pmid: 34432976

3 Wise J. Covid-19: Major study compares myocarditis risk in children after vaccination or infection. *BMJ* 2025;391:. doi: 10.1136/bmj.r2330 pmid: 41193228