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Covid-19: Two rare vaccine side effects detected in large global study

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The largest vaccine safety study to date has identified two new, but very rare, side effects associated with covid-19 vaccines—transverse myelitis and acute disseminated encephalomyelitis.

The Global Vaccine Data Network cohort study included 99 million vaccinated people from 10 sites across eight countries. Researchers compared the observed with expected rate for 13 neurological, blood, and heart related medical conditions.

The study, published in *Vaccine*, confirmed previously identified rare safety signals for myocarditis and pericarditis after a mRNA vaccine (Pfizer and Moderna) and Guillain-Barré syndrome and cerebral venous sinus thrombosis (CVST) after viral vector vaccines (AstraZeneca).¹

There was a statistically significant increase in Guillain-Barré syndrome within 42 days after the first dose of the AstraZeneca vaccine—76 events were expected and 190 events were observed (observed to expected ratio 2.49; 95% confidence interval 2.15 to 2.87). A statistically significant increased risk of CVST was also observed following the first dose of the AstraZeneca vaccine (OE ratio 3.23; 95% CI 2.51 to 4.09).

The study also confirmed significantly higher risks of myocarditis following the first, second, and third doses of the Pfizer and Moderna vaccines as well as pericarditis after the first and fourth dose of Moderna vaccine, and third dose of AstraZeneca vaccine in the 42 days following vaccination.

As well as these known risks the researchers also identified a possible safety signal for acute disseminated encephalomyelitis (ADEM) and transverse myelitis with both viral vector and mRNA vaccines.

This was then further investigated by a second study, also published in *Vaccine*, which analysed a separate dataset for 6.7 million people in Australia.²

This study found an increased risk of ADEM (all dose relative incidence 3.74; 95% CI 1.02 to 13.70) and transverse myelitis (dose 1 RI 2.49; 95% CI 1.07 to 5.79) associated with the AstraZeneca vaccine. No associations were observed between mRNA covid-19 vaccines and either side effect.

The researchers said the findings translate to “an extremely small absolute risk” of acute disseminated encephalomyelitis (0.78 per million vaccine doses) and of transverse myelitis (1.82 per million vaccine doses). “Any potential risk of acute disseminated encephalomyelitis or transverse myelitis should be weighed against the well established protective benefits of vaccination against covid-19 and its complications,” they wrote.

“The size of the population in this study increased the possibility of identifying rare potential vaccine safety signals,” said lead author Kristýna Faksová of the department of epidemiology research, Statens Serum Institut, Copenhagen, Denmark. “Single sites or regions are unlikely to have a large enough population to detect very rare signals.”

The Global Covid Vaccine Safety Project is funded by the US Centers for Disease Control and Prevention to allow the comparison of the safety of vaccines across diverse global populations.

¹ Faksova K, Walsh D, Jiang Y, et al. Covid-19 vaccines and adverse events of special interest: A multinational Global Vaccine Data Network (GVN) cohort study of 99 million vaccinated individuals. *Vaccine* 2024 Feb 12:S0264-410X(24)00127-0. doi: 10.1016/j.vaccine.2024.01.100

² Morgan H, Clothier H, Kattan G, et al. Acute disseminated encephalomyelitis and transverse myelitis following covid-19 vaccination—a self controlled case series analysis. *Vaccine* 2024 Feb 12:S0264-410X(24)00126-9.