In England Cardiovascular Safety of COVID-19 Vaccines among Millions of Adults

Study assesses the impact of different coronavirus disease 2019 (COVID-19) vaccine doses on cardiovascular safety in millions of adults in England.

Study

The current study's researchers utilized whole population longitudinal electronic health records (EHRs) from 45.7 million adults in England between December 8, 2020, and January 23, 2022. The goal was to quantitatively evaluate the associations between first, second, and booster mRNA and non-mRNA COVID-19 vaccine doses and subsequent cardiovascular and thrombotic events.

About 82% of people were previously vaccinated with an initial dose of the ChAdOx1, BNT-162b2, or mRNA1273 vaccine. Compared to the first-dose cohort, individuals in the second and booster cohorts were older, less likely to be of non-White ethnicity and deprived, more likely to have cancer, a history of COVID-19, and take medication to lower lipids or blood pressure.

The National Health Service (NHS) England Secure Data Environment (NHSE SDE) was utilized to compile data on primary care, hospital admissions, COVID-19 vaccination and testing, dispensed medication, and death registrations. The quantitative analyses entailed estimating Cox regressions to obtain adjusted hazard ratios (aHRs) and corresponding 95% confidence intervals. To account for confounding, several factors were controlled for, including age, co-morbidities, sex, and previous COVID-19 status.

Results

In approximately 21 million person-years, 75,655 arterial and 21,230 venous incident thrombotic events were observed. Arterial thrombotic events included ischemic stroke and myocardial infarction, whereas venous events included intracranial venous thrombosis, pulmonary embolism, lower limb deep venous thrombosis, and portal vein thrombosis.

After the first, second, and booster doses of BNT-162b2 and ChAdOx1 vaccines, the incidence of composite arterial thrombotic events was similar or lower than in individuals who did not receive the corresponding vaccine dose. This reduction was stronger following the second and booster doses than following the first dose. For all vaccine brands and doses, the aHR profiles for ischemic stroke and myocardial infarction were similar to those for composite arterial thrombosis.

The patterns for venous thrombotic events were similar to those associated with arterial events. Incidence rates were mostly lower post-administration of the first, second, and booster doses, with stronger effects observed after the second and booster doses.

For all vaccine brands and doses, the aHR profiles for pulmonary embolism and deep venous thrombosis were similar to composite venous thrombosis. However, after the first dose of ChAdOx1, the incidence rate of intracranial venous thrombosis was higher. The risk of intracranial venous thrombosis was not raised after the second dose or for any other vaccine brand.

The incidence of thrombocytopenia was greater after receiving the first dose of ChAdOx1 but not after the second dose. Comparatively, the incidence rate of thrombocytopenia was not greater after receiving a booster dose of mRNA1273 following primary ChAdOx1 vaccination or after the first or second dose of BNT-162b2. A primary course of ChAdOx1 followed by a booster dose of BNT-162b2 after 13-24 weeks was associated with an increased risk of thrombocytopenia.

For all vaccine brands and after all doses, the incidence of mesenteric thrombus and hemorrhagic stroke was lower. After the first and second doses of the BNT162b2 vaccine and some mRNA booster vaccinations, the incidence of myocarditis was higher. Otherwise, the post-vaccination incidence of myocarditis was lower or similar than prior to or without vaccination.

The incidence of pericarditis was higher after the first dose of BNT-162b2 and ChAdOx1, the second dose of BNT-162b2, and after the booster dose of mRNA-based vaccines.

Sub-group analyses revealed that associations between thrombotic events and vaccination were broadly similar, with some exceptions. Males were associated with higher aHRs than females in terms of composite arterial and composite venous events following administration of the first and second doses of BNT-162b2 or ChAdOx1. Furthermore, after the first doses of BNT-162b2 or ChAdOx1, aHRs for composite arterial events were higher in people with unknown ethnicity.

Conclusion

The study findings confirm the cardiovascular safety of COVID-19 vaccines, as the potential risks of rare cardiovascular complications are outweighed by the reduced incidence of common cardiovascular events. Moreover, no new associations or novel cardiovascular complications were reported. Taken together, these observations advocate for the wider acceptance of future COVID-19 vaccination programs.

Source:

https://www.news-medical.net/news/20240804/Study-confirms-cardiovascular-safety-of-COVID-19-vaccines-among-millions-of-adults-in-England.aspx