

COVID vaccination in pregnancy found to protect infants against infection and hospital admission

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Two doses of mRNA COVID-19 vaccine during pregnancy are highly

effective against delta and moderately effective against omicron infection, and are linked to a lower risk of hospital admission in infants under six months of age, finds a Canadian study published by *The BMJ* today.

Protection against omicron infection was greatest when a mother received a second vaccine dose in the later stages of pregnancy and was also greatest for infants in their first eight weeks of life. Receiving a third (booster) dose during pregnancy also bolstered protection against omicron.

Although most cases of COVID-19 in infants are mild, rates of [hospital admission](#) and [severe illness](#) have been higher in infants compared with older children, especially during the first month of life or when infection is complicated by other conditions.

COVID vaccines are not yet licensed for infants under six months of age, but emerging evidence suggests that vaccination during pregnancy may reduce the risk of infection and hospital admission in infants as antibodies are transferred across the placenta and through breastmilk (a process known as passive immunity).

To shed more light on this, researchers in Canada set out to estimate the effectiveness of maternal mRNA COVID-19 vaccination during pregnancy against delta and omicron infection and hospital admission in infants.

The study involved infants younger than six months of age who were born in Ontario between May 7, 2021 and 31 March 31, 2022 and who were PCR tested for COVID-19 infection between May 7, 2021 and September 5, 2022.

This information was then linked to data on the mothers' mRNA

COVID-19 vaccination status during pregnancy (one, two or three doses) or unvaccinated status (no doses), and to recorded delta and omicron-related hospital admissions in infants.

A range of potentially influential factors were taken into account, including each mother's age at delivery, number of previous pregnancies, pre-pregnancy conditions such as diabetes, heart disease and asthma, and infant sex.

In total, 8,809 infants were included in the main analysis (99 positive delta cases compared with 4,365 negative controls, and 1,501 omicron cases compared with 4,847 controls).

The results show that two vaccine doses during pregnancy were 95% effective against delta infection in infants and 97% effective against infant hospital admission due to delta.

Effectiveness of two doses against omicron infection in infants (45%) and admission to hospital (53%) was moderate, but improved with a third dose during pregnancy (73% and 80%, respectively).

Effectiveness of two doses against omicron infection was highest when the second dose was given in the third trimester of pregnancy (53%) compared with the first (47%) or second (37%) trimesters.

Effectiveness of two doses against omicron infection waned over time, from 57% between birth and eight weeks to 40% after 16 weeks of age.

In addition to the 8,809 infants in the main analysis, 421 infants were born to mothers who received only their first [vaccine](#) dose during pregnancy, which offered less protection against infection in infants than two or three doses (81% against delta and 30% against [omicron](#)).

This is an [observational study](#), so can't establish cause, and the researchers can't rule out the possibility that unmeasured factors such as breastfeeding could have differed between infants of vaccinated and unvaccinated mothers, potentially affecting their results.

However, they used detailed information on hospital deliveries, mothers' vaccination status, and PCR test results, and findings were similar after further analyses, suggesting they are likely to be robust.

They point out that mRNA vaccines are highly effective at preventing severe [infection](#) in [pregnant women](#), who have an elevated risk of COVID-19 complications compared with their non-pregnant counterparts.

"In this study, we show that maternal COVID-19 vaccination during pregnancy might have dual benefits by also conferring protection to their [infants](#)," the researchers conclude.

These results concur with previous studies from four different countries and are therefore reassuring, say researchers in a linked editorial. However, they note that in the rapidly shifting landscape of SARS-CoV-2, even solid conclusions cannot provide definitive answers to many practical questions.

As such, they say that although this study reinforces the value of maternal vaccination against COVID-19 during [pregnancy](#), "more studies are needed to better inform vaccination recommendations in an evolving landscape of new SARS-CoV-2 strains and novel vaccines."

More information: Maternal mRNA covid-19 vaccination during pregnancy and delta or omicron infection or hospital admission in infants: test negative design study, *The BMJ* (2023). [DOI: 10.1136/bmj-2022-074035](#)

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