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COVID

Most Studies Show COVID Vaccine Affects Menstrual Cycles, BMJ Review Finds

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Women experienced menstrual cycle disruption following COVID-19 vaccination, including changes in cycle length, flow and menstrual pain, according to a new "state of the science" review published Monday in **BMJ Sexual & Reproductive Health**.

Although women comprised about **half of the participants** in the original **COVID-19** vaccine trials, no data were collected on how the shots affected their menstrual cycles.

Soon after the shots were rolled out, many women started reporting longer periods and **heavier-than-normal bleeding**, and many women who did not normally menstruate — including women on long-acting contraceptives and post-menopausal women — also reported unusual bleeding.

Tens of **thousands of women reported symptoms** to researchers and medical regulators in the U.S. and the **United Kingdom** respectively by mid-2021.

At the time, women's concerns were often "blown off" and they felt "gaslighted," Dr. Alison Edelman, one of the review article authors, **told NBC**.

Researchers called for studies into the issue, in part because they said disrupted menstrual cycles were driving "**misinformation**" that the **vaccines** were dangerous and fueling "vaccine hesitancy."

Since then, dozens of studies have been published on the issue.

For the BMJ review, researchers from Harvard, Boston University, Michigan State University and Oregon Health & Science University surveyed and summarized the existing published literature in the **PubMed database** — which contains peer-reviewed research in the biomedical and life sciences literature — on the COVID-19 vaccines and menstruation.

"Overall, data from published studies indicate small transient changes in menstrual cycle length (ie, longer cycle length) following vaccination," they concluded.

"Additionally, there is some evidence that other menstrual characteristics such as menstrual pain, menstrual flow and intermenstrual bleeding also occur following vaccination."

Because there is more limited research, less is known for certain about the shot's effects on specific age groups, such as adolescents or post-menopausal women. However, data suggest that breakthrough bleeding or menstrual cycle changes affect them, they wrote.

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Evidence also suggests the menstrual cycle phase a woman is in at the time of vaccination may play a role in how vaccination affects menstruation, the researchers said.

Assessing the effects of COVID-19 vaccination on menstrual cycles is important, because the menstrual cycle is a significant indicator of women's health, and **research suggests there is a major gap** in understanding, they said.

However, the lack of standardized measures for assessing menstrual-related issues makes it challenging to summarize the data, they wrote, so many of the studies did not necessarily measure the same outcomes.

The Vaccine Safety Project

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Some mixed results, but shots' effects were undeniable

The researchers identified 53 studies on vaccination and menstruation published before Oct. 31, 2023.

These included 11 prospective cohort studies, which observed a group of women over time to see the effects of the shot, 11 retrospective cohort studies, which looked backward after the fact at the effects of the shot on a group of women and 31 cross-sectional or retrospective case-control studies, which looked backward at the effects of the shot by comparing women who experienced a symptom to those who didn't.

They evaluated the papers for risk of bias and summarized the findings according to the primary ways the COVID-19 vaccine disrupted women's menstrual cycles.

First, they found with certainty that "the COVID-19 vaccine is associated with changes in cycle length, at least in adult populations," noting that adolescent girls were more difficult to study.

Most of the studies, which had focused on cycle length because it is typically a well-tracked and easily defined outcome, found the shot was associated with a longer cycle.

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Studies investigating cycle irregularities other than length were fewer and more mixed, the researchers reported. Some of these showed the shots had **short-term effects** and others revealed issues such as **missed periods** and **intermenstrual bleeding**, with symptoms increasing with the second and then subsequent shots.

Existing studies showed a clear association with cycle irregularities but were insufficient to determine cause, they concluded.



There were also studies examining the vaccines' effect on menstrual flow. These data, they said, were easier to access because there are many **period-tracking apps** that women use to track their flows. However, the data for this metric were also contradictory.

They reported several studies, like one that analyzed data in an app, that didn't identify a difference in the lighter and heavier flow days during menstruation, although they did find a heavier flow overall. However, several studies also **found a change in flow** following vaccination.

Although the researchers emphasized the mixed nature of the results for this metric, they conceded that the data showing the vaccines affect menstrual flow were compelling enough that the UK Medicines and Healthcare products Regulatory Agency and Pfizer and Moderna all list "heavy flow" as a vaccine side effect.

The researchers also found that existing studies show that between 20-40% of menstruating women experience **menstrual pain** following vaccination and that the pain is similar following both the first and second vaccination doses.

They also reported that women with **endometriosis** — a painful **condition** where the lining of the uterus grows outside of the uterus — had worse cycle abnormalities, including fatigue, pain and regularity disorders, than other women.

Several larger studies examining population data found a "slightly increased risk" of bleeding in postmenopausal women. One large study found the risk increased in the **16 weeks** following vaccination. Another found an especially strong statistically significant risk following

a third dose of the vaccine.

A 2022 analysis of the **COVID-19 V-safe data** — a voluntary smartphone-based active surveillance system run by the Centers for Disease Control and Prevention — found that about 4% of the 84,943 reports of menstrual disturbances associated with the shot included postmenopausal bleeding.

"Taken together, it does appear that many postmenopausal individuals experienced some abnormal vaginal bleeding following COVID-19 vaccination and this information is critically important information for this population to know when considering the potential side effects of the COVID-19 vaccination," the authors wrote.

The studies suggested that women using hormonal contraception were somewhat protected from the effects of vaccination on their menstrual cycle. For example, one study found that women taking hormonal contraception had a shorter **delay in their cycle** than those who weren't taking it. The effects varied with different types of contraception.

Another study found women taking hormonal contraception had **more breakthrough bleeding** than women who weren't taking it.

The researchers also noted that all of the studies were conducted with women who had regular menstrual cycles pre-vaccination because it is too difficult to discern whether irregularities among women who already have irregular periods are vaccine-related or not.

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However, many women with irregular cycles also reported more irregularities following the shot.

Existing studies, they concluded, tend to have a moderate-to-high risk of bias. For example, cross-sectional and retrospective studies select participants after vaccination and after menstrual changes have occurred, so these may have some kind of selection bias.

There is also a danger, when self-reporting, that research subjects will make spurious associations, they said.

Many of the studies also didn't have access to vaccination data, so they couldn't differentiate among vaccines.

The researchers also noted that the causal mechanisms through which the COVID-19 vaccines affected menstruation is unknown. They said, "It is not surprising that temporary changes to the menstrual cycle could occur with vaccination," hypothesizing that a combination of stress and inflammation could affect the balance of hormones that determine the cycle.

The researchers concluded that there is now solid evidence from the past three years indicating the effect of the COVID-19 vaccine on the menstrual cycle.

Most of the papers they analyzed were published in smaller obstetrics and gynecology journals because academic medicine doesn't consider it an important issue, they said. They encouraged wider future publication and also called for measuring and monitoring of menstrual cycles to be included as a key outcome in future clinical trials.



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