

## Mini Review

## Open Access

## COVID-19 Vaccinations and Menstrual Cycle Alteration

Sadique Hussain<sup>1\*</sup>, Varunesh Chaturvedi<sup>1</sup>, Mansi Singh<sup>1</sup>, Priya Kumari<sup>1</sup> and Himanshi Khatri<sup>2</sup>

<sup>1</sup>School of Pharmaceutical Sciences, Jaipur National University, Jaipur, Rajasthan, India

<sup>2</sup>Faculty of Pharmaceutical Sciences & Nursing, Vivekanand Global University, Jaipur, Rajasthan, India

### ABSTRACT

The rapid development of safe and effective vaccines against Coronavirus Disease 2019 (COVID-19) has been a triumph of medical sciences, but vaccines only work if people take them. COVID-19 vaccination may be associated with a change in menstrual cycle length following vaccination. Although there is extensive evidence that COVID-19 vaccination does not affect fertility, misinformation is that it could have been a major source of vaccine hesitancy among young women. As the vaccination program was rolled out to younger age groups, some people noticed menstrual changes after the COVID-19 vaccination, and many members of the public found these reports concerning. The research was needed to generate robust data to inform healthcare professionals and the public about these potential side effects. Menstrual changes have been reported in association with a variety of vaccines, including those against pathogens other than severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), so this work aims to describe SARS-CoV-2 infection and the menstrual cycle changes because of it.

### \*Corresponding author

Sadique Hussain, School of Pharmaceutical Sciences Jaipur National University Jaipur, Rajasthan, India

**Received:** January 19, 2023; **Accepted:** January 25, 2023; **Published:** February 03, 2023

**Keywords:** Vaccine, Menstrual Cycle, Adverse Effect, Fertility, Menstrual Changes

### Abbreviations

Coronavirus Disease 2019 (COVID-19).

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

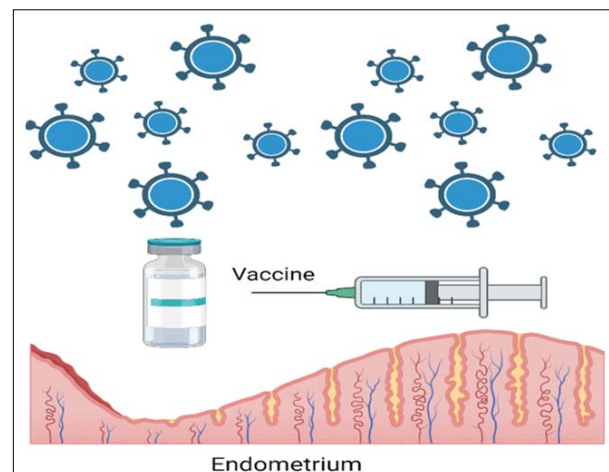
Post-acute sequelae of SARS-CoV-2 (PASC)

### Introduction

The menstrual cycle involves complex interactions between various tissues, hormones, and organ systems. As such, the menstrual cycle is sensitive to endogenous and exogenous factors, including infection and changes in lifestyle. Over a year into the global COVID-19 pandemic caused by SARS-CoV-2, there is increasing interest in understanding the post-acute sequelae of SARS-CoV-2 (PASC) following infection. Emerging evidence suggests that SARS-CoV-2 infection, COVID-19 vaccination, and/or psychological stress related to the COVID-19 pandemic may influence the menstrual cycle [1].

People across the world are getting vaccinated against the virus as COVID-19 spreads. The possibility of adverse reactions to COVID-19 vaccinations has always been a source of concern [2-4]. It is also unclear whether COVID-19 immunizations impact female vaccinators' menstrual cycles. Unfortunately, menstrual cycle outcomes were not collected in clinical studies of the current COVID-19 vaccines [5-7]. The menstrual cycle of a woman runs from the first day of her menstruation to the first day of her next cycle. Many factors, including nutrition, sleep, and exercise, as well as illness, travel, and stress, are known to influence the length of the menstrual cycle [8]. COVID-19 vaccines have

caused a variety of side effects in people, including pain at the injection site, nausea, aches, fever, and fatigue. In more severe situations, patients may have insomnia, lack of appetite, and feelings of depression. Furthermore, vaccination may shorten or lengthen the menstrual cycle by influencing the secretion and stability of estrogen, progesterone, follicle-stimulating hormone, luteinizing hormone, and other hormones associated with female reproduction [9]. Figure 1 shows the COVID-19 vaccine's impact on the menstrual cycle.



**Figure 1:** Can the COVID-19 vaccine impact periods?

Recently, researchers from Oregon Health & Science University studied 3,959 people aged 18 to 45 years old (vaccinated 2,403; unvaccinated 1,556) in the United States for three consecutive

cycles before receiving their first vaccine dose, followed by vaccine-dose cycles (cycles 4-6) or, if unvaccinated, six cycles over a similar period [10,11]. The majority of those vaccinated (55%) utilized the Pfizer-BioNTech vaccine (Moderna 35%, and Johnson & Johnson/Janssen 7%). The investigators calculated the mean within-individual variation in the cycle and menstrual duration (three pre-vaccine cycles vs first and second dose cycles in the vaccinated cohort, and the first three cycles vs cycles four and five in the unvaccinated cohort). They used mixed-effects models to calculate the corrected difference in the cycle and menstrual length change between vaccinated and unvaccinated women. The results of the study showed that the onset of menstruation was about a day later than usual after vaccination. The overall number of menstruation days, on the other hand, did not change following vaccination. The COVID-19 vaccine causes a little alteration in cycle length but not in menses length. Further research is needed to establish the influence of COVID-19 vaccines on other elements of women's menstrual cycles, such as if they produce abnormal bleeding or other symptoms, according to the study [12,13].

It is important to note that most people who report such a change following vaccination find that their period rapidly returns to the normal and extensive investigation has found no evidence that COVID-19 vaccination adversely impacts female fertility. Nonetheless, people are concerned by these reports. Investigating the potential link between COVID-19 vaccination and menstrual changes is important for maintaining public trust in the vaccination program and, if a link is found, to allow people to plan for potential changes to their cycles [14].

### Conclusion

The impact of COVID-19 on the menstrual cycle is largely unknown. People who reported changes in their menstrual cycle after SARS-CoV-2 infection reported more COVID-19 symptoms than those who did not. There has not been much research on how COVID-19 vaccines or other vaccines alter the menstrual cycle on a worldwide scale. These findings serve as a guide for women who want to learn more about the COVID-19 vaccine's side effects and make their own decisions.

### Competing Interests

The authors declare no conflicts of interest.

### Funding

Nil.

### References

1. Khan SM, Shilen A, Heslin KM, Ishimwe P, Allen AM, et al. (2022) SARS-CoV-2 infection and subsequent changes in the menstrual cycle among participants in the Arizona CoVHORT study. *American Journal of Obstetrics & Gynecology* 226: 270-273.
2. Polack FP, Thomas SJ, Kitchin N, Judith Absalon, Alejandra Gurtman, et al. (2020) Safety and efficacy of the BNT162b2 Mrna Covid-19 vaccine. *New Engl J of Med* 383: 2603-2615.
3. Oliver SE, Gargano JW, Marin M, Megan Wallace, Kathryn G Curran, et al. (2021) The advisory committee on immunization practices' interim recommendation for use of Moderna COVID-19 vaccine-United States, December 2020. *MMWR Morbidity and mortality weekly report* 69: 1653-1656.
4. Hussain MS, Shama G (2022) the Burden of Cardiovascular Diseases Due to COVID-19 Pandemic. *The Thoracic and Cardiovascular Surgeon* DOI: 10.1055/s-0042-1755205.
5. Sadoff J, Gray G, Vandeboosch A, Vicky Cárdenas, Georgi Shukarev, et al.(2021) Safety and efficacy of single-dose Ad26.COV2.S vaccine against Covid-19. *New Engl J of Med* 384: 2187-21201.
6. Baden LR, El Sahly HM, Essink B, Karen Kotloff, Sharon Frey, et al. (2021) Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine. *New Engl J of Med* 384: 403-4016.
7. Hussain MS, Singh S, Dhingra G, Khatri H, Tanwar S, et al. (2022) Advances in the Adverse Effects of Covid-19 Vaccination and the Concept of Vaccine Development. *Journal of Pharmaceutical Research International* 34: 19-38.
8. Hussain MS, Tyagi S, Kaur G, Bahl G (2022) The Evolving COVID-19: Omicron. *International J. of Biomed Research* 2: 1-3.
9. Hussain MS (2022) Covid-19 Vaccine Efficacy on Omicron Variant. *Bioequivalence & Bioavailability International Journal* 6: 1-2.
10. CDC. COVID-19 vaccination. Centers for Disease Control and Prevention (2022) <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html>.
11. Padda J, Khalid K, Hitawala G, Nitya Batra, Sindhu Pokhriyal, et al. (2021) Depression and its effect on the menstrual cycle. *Cureus* 13: e16532.
12. Edelman A, Boniface ER, Benhar E, Leo Han, Kristen A Matteson, et al. (2022) Association between menstrual cycle length and Coronavirus Disease 2019 (COVID-19) vaccination: A U.S. Cohort. *Obstetrics and Gynecology* 139: 481-489.
13. Gibson EA, Li H, Fruh V, Malaika Gabra, Gowtham Asokan, et al. (2022) Covid-19 vaccination and menstrual cycle length in the Apple Women's Health Study. *npj Digit Med* 5: 165.
14. Alvergne A, Von Woon E, Male V (2022) Effect of COVID-19 vaccination on the timing and flow of menstrual periods in two cohorts. *Frontiers in Reproductive Health* 4: 952976.

**Copyright:** ©2023 Sadique Hussain, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.