



COVID 19: ACUTE AND LONG TERM IMPACT ON MENSTRUATION

Obstetrics & Gynaecology

Pooja Agarwal*

Senior Resident In Department Of Obstetrics And Gynecology, Saket Hospital, Jaipur, Rajasthan, India *Corresponding Author

Nisha Thakur

Chief Consultant In Department Of Obstetrics And Gynecology, Jln Hospital And Research Center, Bhilai, Chhattisgarh, India

ABSTRACT

Background: COVID-19 has affected society as whole inclusive of all the systems of body. Consequently, reproductive age females may have experienced changes in their menstrual cycles during COVID, which has been under looked and a very few studies are present for the same. Therefore, as the world has greatly coped with the COVID-19 pandemic, there is a need for further research to help, understand and mitigate the impacts of the pandemic on menstrual health, which could help to counsel and treat the affected individuals. **Aim:** To find the acute and long-term impact of covid-19 on menstruation. **Methods:** We conducted an ambi-directional study, where we retrospectively compared menstrual cycle changes in females before and during COVID infection from January 2021 to April 2021 and followed them up prospectively from May 2021 to December 2022. The study was conducted at JLNH&RC Hospital, Obstetrics and Gynecology Department, in Bhilai, Chhattisgarh. All estimates were adjusted for age, parity, BMI, education and relationship status. Finally, 214 women were selected after strictly following inclusion and exclusion criteria. **Results:** By analyzing the menstrual changes of patients, it was found that patients had various extents of transient menstrual changes, mainly manifesting as delayed cycles, dysmenorrhea, prolonged cycle and decreased volume. These changes returned to normal after few cycles post covid. **Conclusion:** COVID-19 causes small changes to menstruation that quickly resolve. There are no permanent menstrual changes.

KEYWORDS

COVID, menstrual cycle, menstruation disturbances.

INTRODUCTION

The reproductive process in women is a complex and highly evolved interaction of central nervous system, pituitary gland and ovary that contributes to a normal menstrual cycle.⁽¹⁾ Females who are regularly menstruating can also experience sporadic or stress-induced ovulation disturbances, which may result in a skipped cycle or a temporary change in cycle length.⁽²⁾ Menstrual disorders have become widespread over the last few generations and are known to have cause-effect relationship with hormonal and pathophysiological status of body.⁽³⁾

We live in unpredictable modern times, where we experienced outbreak of a particular viral disease, COVID-19, which has disrupted societies and personal lives.⁽⁴⁾ The clinical implications of SARS-CoV-2 infection are highly variable.⁽⁵⁾

Consequently, reproductive age females may have experienced changes in their ovulatory and menstrual cycles during COVID,⁽⁶⁾ which has been under looked and a very few studies are present for the same. Although new research is continuously being published on COVID-19, the lack of high-quality research focusing on COVID-19 and the menstrual cycle mirrors the broader focus of medical research.⁽⁷⁾

Therefore, as the world has greatly coped with the COVID-19 pandemic, there is a need for further research to help, understand and mitigate the impacts of the pandemic on menstrual health, which could help to counsel and treat the affected individuals.

METHODS

Study design

We conducted an ambi-directional study, where we retrospectively compared menstrual cycle changes in females before and during COVID infection and followed them up prospectively. Cycle data was collected retrospectively from January 2021 to April 2021 and prospectively analyzed from May 2021 to December 2022. The study was conducted at JLNH&RC Hospital, Obstetrics and Gynecology Department, between May 2021 and December 2022, in Bhilai, Chhattisgarh.

Inclusion criteria

We included females of Bhilai (Chhattisgarh) aged 15–50 years who were covid positive in April 2021 and were at least three cycles post pregnancy in January 2021. Therefore, total sample size is 253.

Exclusion criteria

Pre covid,

1. abnormal length of cycle (<24 or >38 days) = 7
2. abnormal days of bleeding (<2 or >7 days) = 4
3. presence of dysmenorrhea = 3

4. intermenstrual spotting = 1
5. heavy menstrual flow or scanty flow = 6
6. polycystic ovarian syndrome = 4
7. thyroid disorder = 3
8. endometriosis = 1
9. use of emergency contraception during at least one study cycle = 2
10. use of oral contraceptives in last 3 months of start of study i.e. between October to December 2020 = 4
11. menopausal = 4 Therefore, 39 females were excluded.

Intervention

We collected information of covid positive females in April 2021 in Bhilai. Individuals without confirmed covid test positive were not included in the data. An informed written consent was obtained from each participant.

We included three pre covid cycles and one covid infected cycle, for retrospective study and 20 months of follow up thereafter. Therefore, each individual contributed 2 years of cycles and cycle four was the first covid positive cycle.

Their menstrual cycle patterns studied were as follows:

1. a change in cycle length (i.e. less days than earlier or more days)
2. frequency of cycle (more frequent or less frequent)
3. associated with pain or not
4. intermenstrual spotting or not
5. amount of flow (increased or decreased)

Additional sociodemographic information was collected to further characterize the sample. We categorized them on basis of age as 15–19, 20–24, 25–29, 30–34, 35–39, 40–44 and 45–49 years. Additional parameters included were parity (nulliparous vs parous), body mass index (BMI [calculated as weight in kilograms divided by height in meters squares]; underweight or normal weight, overweight or obese), education (undergraduate, graduate or postgraduate) and relationship status (in a steady relationship or not). All estimates were adjusted for age, parity, BMI, education and relationship status.

The changes in the menstrual cycles pre, during and post covid were observed. Finally, 214 women were selected after strictly following inclusion and exclusion criteria. The study was conducted after the approval of the Institutional Ethics Committee (IEC).

Data collection

Our primary outcome was the within-individual changes in menstrual cycle from the three-cycle pre covid positive status to the covid positive cycle and whether the changes persisted over time in post COVID cycles. All data collection was done by the principal

investigator.

Data analysis

For statistical analyses, data were used by the SPSS program for Windows, version 20.0. Continuous variables were presented as mean $\pm$ standard deviation (SD), and categorical variables were presented as absolute numbers and percentage (%). Data were checked for normality before statistical analysis. Normally distributed continuous variables were compared using the unpaired t test, whereas the Mann-Whitney U test was used for those variables that did not show normal distribution. Categorical variables were analyzed using either the chi square test or Fisher's exact test. A P value less than 0.05 was considered statistically significant.

RESULTS

Of 253 eligible individuals, 39 females were excluded. 214 females were left for the study. There was no loss to follow-up.

Table 1. Characteristics of participants

Variables	Intervention group (214)
Age (n, %)	
15-19	22(10.28%)
20-24	24(11.22%)
25-29	47(21.96%)
30-34	39(18.22%)
35-39	33(15.42%)
40-44	29(13.55%)
45-49	20(9.35%)
Education (n, %)	
Undergraduate	58(27.10%)
Graduate	82(38.32%)
Postgraduate	74(34.58%)
Stable relationship (n, %)	
Yes	134(62.62%)
No	80(37.38%)
BMI (pre pregnancy) (n, %)	
Normal	92(42.99%)
Abnormal (Underweight/Overweight/Obese)	122(57.01%)
Parity (n, %)	
Nulliparous	83(38.79%)
Parous	131(61.21%)

Table 2. Changes in menstrual cycle pattern

Variables	Covid cycle (n, %) as compared to pre covid cycle
normal cycles	176(82.24%)
delayed cycles (oligomenorrhoea)	13(6.078%)
frequent menses (polymenorrhoea)	2(0.94%)
Dysmenorrhea (required medical treatment)	7(3.27%)
menorrhagia (heavy flow)	3(1.40%)
intermenstrual spotting	2(0.94%)
decreased days of bleeding or only spotting during their menses	5(2.33%)
Prolonged cycle	6(2.80%)

The above-mentioned changes which developed in the COVID cycle as compared to the pre covid cycle were further studied. These changes persisted for 2 to 3 post COVID cycles i.e. till June- July 2021. After that the cycles returned to normal i.e. same as the pre COVID cycles.

DISCUSSION

As it is well known, that there are many viruses that affect the female reproductive system. For example, menstrual disorders are prevalent in women with HBV or HCV infections.⁽⁶⁾

Very few studies are present which emphasis impact of covid on menstruation. Few studies conclude no effect whereas others say some effect of covid on menstrual cycle. In our study, we found changes in menstrual cycle by covid infection. By analyzing the menstrual changes of patients, it was found that patients had various extents of transient menstrual changes, mainly manifesting as delayed cycles, dysmenorrhea, prolonged cycle and decreased volume. These changes returned to normal after few cycles post covid. The menstrual changes observed, might be attributed to the immunosuppression caused by

covid or due to covid related stress and low mood which might have caused some hormonal changes in the body. These things need further extensive large-scale study for any affirmation.

So, we conclude that COVID-19 causes small changes to menstruation that quickly resolve.

There are no permanent menstrual changes. Menstruation and lower reproductive tract health will gradually return to pre-COVID-19 status within 2-3 months of recovery, which can help alleviate excessive concerns about the effects of COVID-19 on the reproductive system.

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