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Impact of COVID-19 vaccination on the menstrual cycle in reproductive age group: An observational study

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Abstract

Objective: To assess the prevalence of menstrual irregularities post COVID-19 vaccination among the women in reproductive age group (18-45 years).

Methods: The study involved a questionnaire survey conducted among 108 women in the reproductive age group 18-45 years with COVID-19 vaccination status and prior cycles regular, who attended the OPD in the Department Of Obstetrics And Gynecology, Yenepoya Medical College, Mangalore, Karnataka. The data were collected over the period of May 2021 to April 2022. The study excluded women with history of irregular cycles, intake of OCPs and other medications including antipsychotics, history of IUCD insertion, diagnosed with PCOD, BMI >30 kg/m², postpartum period, lactating mothers, medical disorders including Hypertension, Diabetes Mellitus, thyroid disorders.

Results: Out of 108 participants, 60 (55.5%) women reported irregular cycles with change in the length, duration and flow of cycle whereas 48 women (44.4%) had normal cycles in the immediate post vaccination period. Few participants, 18 (16.6%) showed new symptoms associated with menstrual cycle in the study.

Conclusion: The study showed that COVID-19 vaccination have association in the occurrence of abnormal changes in menstrual cycle in the post vaccination period.

Keywords: COVID-19 vaccine, menstrual cycle, menstrual abnormalities, reproductive age

Introduction

COVID -19 or corona virus disease -2019 pandemic has affected every aspect of human life worldwide [1]. Several organizations put forward in the development of vaccination. Vaccines developed were used to provide mass immunization. Recent studies have addressed the unexpected menstrual abnormalities in the post vaccination time.

The study showed the potential link between COVID-19 vaccination and changes to menstrual cycle length with not much significant effect after the first dose and a delay of 0.45 days after the second dose. The cycle lengths normalized by two cycles after vaccination [2]. The menstrual irregularities reported in the studies were irrespective of the type of vaccine and the timing of vaccine administration.

Studies have showed vaccination result in cytokine production as part of immune response which may transiently interfere with the hypothalamo-pituitary (HPO)-axis and the ovarian hormone production that affect the menstrual cycle [3,4].

The menstrual bleeding pattern is said to be one of the important indicator of reproductive health [5]. The cycle vary in a persons life. Menstrual irregularity are considered when there is change in the frequency, duration or regularity of the cycle [6]. Menstrual irregularity affects women's general health status and the ability to perform routine chores. Thus the change in the menstrual cycle necessitates the need for evolution of the healthcare system to provide satisfactory outcome for the patients, to deal with the symptoms and improve the quality of life.

The aim of the study was to assess the prevalence of menstrual irregularities after COVID-19 vaccination.

Methods

This is an observational study performed using a questionnaire survey on 108 female participants of reproductive age group (18-45 years), who attended the OBG OPD in Yenepoya Medical College, over the period of May 2021 to April 2022. Only those participants who has had regular menstrual cycles prior to COVID-19 vaccination (1 or 2 doses) were included in the

study. Statistical analysis was done using the Jamovi project (2022). *jamovi*. (Version 2.3) [Computer Software].

Inclusion criteria

- Age 18-45 years (reproductive age group)
- Vaccinated with covid-19 vaccine 1 or 2 doses
- Prior cycles regular (last 6 months)
- Willing to participate in the study

Exclusion criteria

- Prior irregular cycles
- History of OCPS/IUCD
- PCOD
- BMI >30 kg/m2
- Postpartum period/lactating
- Medical disorders: HTN, DM, thyroid disorders
- Medications including antipsychotics

Results

In the study, it was observed that all the participants were vaccinated with 2 doses of COVID 19 vaccine. The study comprised of participants from random professions. The median age of the study group with complaints of irregular cycle in the post vaccination period were 30.5 years. Majority of the participants had BMI within the normal range irrespective of the menstrual cycle, 52 (86.6%) with abnormal cycles and 44 (91.6%) with normal cycles.

Table 1: Association of demographic parameters with the menstrual cycle

Age (years)	Abnormal cycles	Normal cycles
18-24	18 (30%)	18 (37.5%)
25-29	20 (33%)	6 (12.5%)
30-34	6 (10%)	8 (16.6%)
35-39	12 (20%)	8 (16.6%)
40-45	4 (6.6%)	8 (16.6%)
BMI (KG/M ²)		
<18.5	0	0
18.5-22.9	52 (86.6%)	44 (91.6%)
23-24.9	2 (3.3%)	2 (4.1%)
>=25	6 (10%)	2 (4.1%)
Marital status		
Married	46 (76.6%)	36 (75%)
Single	14 (23.3%)	12 (25%)

Out of 108 participants, 60 (56%) women reported irregular cycles and 48 (44%) with normal cycles in the immediate post vaccination period. The major complaint were change in the length of the menstrual cycle with 30 (27.7%) women had delayed cycles and 14 (27.9%) had frequent cycles. Those who reported with increase in the flow and duration of cycles were 18 (16.6%) each.

Out of 60 participants who had irregular cycles, 28 (46.6%) sought medical assistance which included hormonal therapy, NSAIDS and hematinics with subsequent symptomatic improvement. Out of 28 people who required medical management, 6 were transfused with 2 units of PRBC to correct the anemia.

The study also showed that 18 (16.6%) out of 108 participants had onset of new symptoms associated with menstrual cycle. The symptoms included were dysmenorrhea 8(44.4%), mastalgia 6 (33.3%), PMS 2 (11.1%) and others 2 (11.1%).

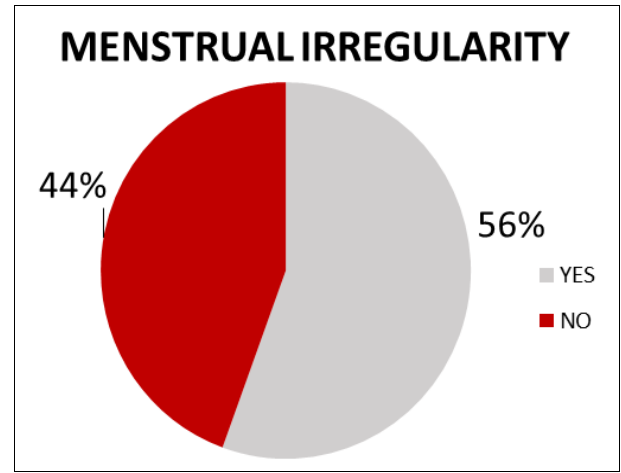


Fig 1: Distribution of study participants with change in the menstrual cycle

Table 2: Menstrual cycle abnormalities in duration, flow and length of the cycle

Menstrual irregularity	Flow	Duration	Length of cycle
Increased	18 (16.6%)	18 (16.6%)	30 (27.7%)
Decreased	0	0	14 (12.9%)
No change	90 (83.3%)	90 (83.3%)	64 (59.2%)
Total	108	108	108

Table 3: Distribution of the cases with abnormal menstrual cycle who sought medical assistance

Sought medical assistance	Abnormal cycles	Percentage
Yes	28	46.6%
No	32	53.3%
Total	60	

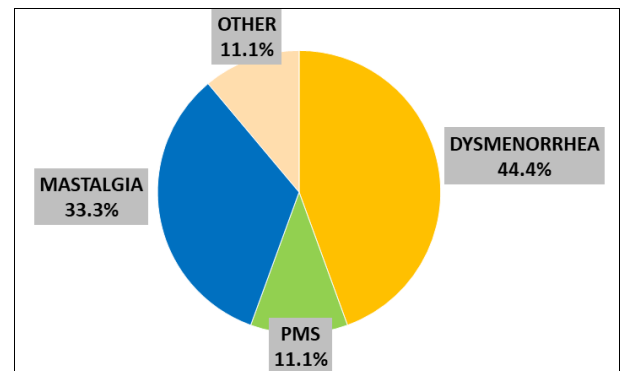


Fig 2: Onset of new symptoms associated with menstrual cycle

Discussion

Many international studies showed correlation between menstrual irregularity and post COVID 19 vaccination. This study has been conducted to understand the relation in the Indian population.

In the study, menstrual irregularity was found in 55.5% of the study population who received COVID-19 vaccination. There was a significant relation between the COVID 19 vaccination and menstrual irregularity in the reproductive age group (p value 0.02) with median age group 30 years. In the study, Suaeleh *et al* [7], showed median age group of 21 years and majority of participants had normal BMI.

MM Al-Mehaisen *et al* [8], analyzed the menstrual flow and observed statistically significant change in the flow with 24.5% of participants had increased flow and 15.5% had reduced flow. 23.65% showed delayed cycles. In this study 27.7% presented

with delayed cycles.

Most of them required medical management (28 out of 60) and the rest were reassured. It took more than 6 months for the cycles to get regularised. 50% of the population (8 out of 12) with increased BMI had menstrual irregularities.

The study revealed a possible association between the COVID-19 vaccination and the occurrence of abnormal menstrual cycles. The limitation of the study is that it involved smaller group of population, where a larger sample size with follow-up could give more information.

The study highlighted the need for reassurance in the unexplained change in menstrual cycle post vaccination period.

Conclusion

We have observed in our study that there is a correlation between COVID 19 vaccination and abnormal menstrual cycles.

Conflict of Interest

Not available

Financial Support

Not available

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