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ADVERSE EFFECT OF COVID-19 VACCINATIONS ON MENSTRUAL PATTERN AMONG YOUNG WOMEN

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Abstract

Background: A significant proportion of women in their reproductive years, ranging from 14% to 25% globally, experience menstrual irregularities as a result of several underlying causes that have been identified. Menstrual imbalance significantly increases the risk of developing major disorders. The issue of COVID-19 vaccinations potentially impacting menstrual health should be acknowledged and addressed to facilitate accurate diagnosis and treatment. This would not only enhance the women's quality of life but also stimulate discussions about the safety of the vaccines, which have been given to over 71.8% of the global population.

Methodology: Conducting a comprehensive literature study required a thorough analysis of papers available on PubMed. Only complete papers written in English were taken into account. The inclusion criteria comprised works specifically related to the effects of COVID-19 vaccinations on menstruation patterns, as well as studies that utilized surveys based on questionnaires.

Result: The data examined from the extensively evaluated publications revealed evident menstrual-related fluctuations in young girls worldwide. Populations that got the vaccination saw various effects, including changes in the time of menstruation, the severity of menstrual symptoms, incidences of menopausal bleeding, and return of menses.

Conclusion: The comprehensive research done have together determined that Covid-19 vaccinations do undoubtedly contribute to a significant incidence of adverse effects on menstruation irregularities, pre-menstrual symptoms, and vaginal bleeding. Nevertheless, the exact reason for these changes remains unknown. Due to the significant impact on public health, it is crucial to conduct more research efforts to determine the precise causes of these changes and discover preventive strategies.

INTRODUCTION

Over 5.55 billion individuals globally have administered a Covid-19 vaccine, which accounts for approximately 72.3 percent of the global population. 1 Although there have been reports of typical adverse effects experienced by the community, the focus on menstrual-related side effects has been minimal.

Women's overall health can be inferred from their menstrual cycle; those with irregular and prolonged cycles are more likely to die before the age of 70. Individuals with irregular menstrual cycles have a higher vulnerability to metabolic disorders such as diabetes mellitus and dyslipidemia, which increases their risk. 2

Hence, the healthcare system encounters a notable obstacle in effectively addressing menstrual irregularities, given their profound influence on the day-to-day functioning of women. Recognising the general frequency of menstrual irregularities, the American Academy of Pediatrics has suggested that menstrual cycle observations be included in the vital signs assessment for teenage girls. 2

COVID-19 immunisation has been observed to cause various changes in the menstrual cycle, encompassing elongated and shortened periods, skipped cycles, intensified and diminished menstrual flow, and intermenstrual spotting. 3

Nevertheless, clinical trials of vaccines fail to gather data on outcomes pertaining to menstrual cycles, resulting in a substantial knowledge deficit regarding these matters. 3 Approximately46.7% of individuals experienced irregularities in their menstrual cycles upon receipt of bothdoses of the COVID-19 vaccination. Specifically, 22.9% reported increased menstrualdiscomfort after the first dosage, while 21.4% experienced the same after the second dose. 4 The reported prevalence rates of anomalies are concerning and necessitate a thorough research dueto their implications for public health and the overall quality of women's lives.

A prospective cohort research was done in the United States from December 2020 to January 2022 to examine menstrual abnormalities and hemorrhage following Covid-19 vaccines. The type and quantity of immunisation doses received, reported local and systemic reactions, and requested medical attention were among the characteristics of the respondents that the researchers examined in relation to symptom themes. A smartphone-based active surveillance system was used to collect data, asking open-ended questions about irregular menstruation, blood occurrences, and the start of menstruation again. A total of 63,815 women provided information about monthly abnormalities or vaginal bleeding, out of which 62,679 were female respondents (1.0% of the total 5,975,363 women respondents aged 18 years or older). Two variables that were identified were the temporal occurrence of menstruation (70,981 [83.6%] responses) and the intensity of menstrual symptoms (56,890 [67.0%] responses). Menopausal bleeding received 3439 (4.0%) comments, while the resumed menses received 2378 (2.8%) responses. These were two of the other themes covered. 5

Additionally, a global cross-sectional study was out between June 10, 2021, and July 10, 2021 investigated the potential for monthly abnormalities to arise in females following COVID-19 vaccination. To evaluate the sensitivity and specificity of factors linked to knowledge about menstrual irregularities after COVID-19 vaccination, the receiver operating characteristic analysis was employed. Women who received vaccinations had a significantly increasedchance of experiencing changes in inter-cycle length between periods compared to those whowere not vaccinated. Out of a total of 314 healthcare workers (HCW) and 196 non- healthcare workers (non-HCW), 60 HCWs (19.1%) and 28 non-HCWs (14.3%) had awareness regarding menstrual irregularities. 6

A cross-sectional study was undertaken in the MENA region among 2269 post-menarcheal women who had received a vaccine and were not pregnant or lactating, and had no history of primary ovarian insufficiency. Approximately 66.3% of the individuals reported experiencing menstruation symptoms following immunization, with 46.7% of them encountering these symptoms after receiving their initial dose. The type of vaccine did not have a significant impact on the occurrence of abnormalities. This investigation has identified a correlation with Covid-19 vaccinations and irregularities in the menstrual cycle. 2

In addition, a comparable study conducted on young Japanese persons revealed that the discrepancy between the anticipated and actual duration of the menstrual cycle was 1.9 ± 3.0, 1.6 ± 2.8, and 2.5 ± 3.8 days prior to and following the administration of the first and second immunisation doses, respectively. During the menstrual phase, the incidence of side effects after the second dosage of the immunisation was particularly prominent. The undesirable responses of vaccine were most pronounced when administered during menstruation and least pronounced during ovulation. 7

A follow-up cross-sectional study was carried out as part of the EVA project. Of the women that took part in this research, 11,017 (or 78% of the participants) indicated that their menstrual cycle changed after receiving an inoculation, while 3136 said that they had no changes at all. Most of the people who reported irregularities were elderly, and some of them were smokers. There is only one character in the user's content, and that is the closing parenthesis. The most common changes with relation to premenstrual symptoms were increased tiredness (43%), distension in the abdomen (37%), irritability (29%), depression (28%), and headache (28%). Increased menstrual bleeding (43%), increased menstrual discomfort (41%), delayed menstrual onset (38%), decreased menstrual bleeding duration (34.5%), and shortened menstrual cycle length (32%), were the main monthly alterations observed. 4

METHODOLOGY

The objective of this literature review is to establish a clear correlation between Covid-19 vaccinations and atypical menstrual problems observed in young females. Prior to the emergence of the pandemic, women were already confronted with the difficulties presented by menstrual issues. Nevertheless, if the administration of Covid-19 vaccinations increases the likelihood of such anomalies, it is crucial to carry out comprehensive investigations and share this information widely.

The exhaustive investigation entailed a thorough scrutiny of complete-text articles accessible on PubMed, all of which were written in English. We primarily focused on studies that utilized self-administered surveys to acquire data. Furthermore, our aim was to include research undertaken in various geographical areas, encompassing regions such as Saudi Arabia and Japan. This strategy was implemented to augment the comprehensiveness of the investigation, providing a more comprehensive viewpoint on the menstrual health irregularities post vaccination.

RESULTS

Our thorough study uncovered a range of menstrual irregularities that occurred after receiving the vaccine. Among the documented irregularities, there was a predominant occurrence of differences in timing, particularly interesting was a subgroup of subjects who had an increase in the intensity of their menstrual symptoms. In addition, a small proportion of individuals developed menopausal bleeding, suggesting a wide variety of effects on the menstruation.

Among the 63,815 participants in the observational cohort study conducted by the CDC COVID-19 Response Team in Atlanta, Georgia, a total of 62,679 female respondents (constituting 1.0% of the total 5,975,363 female respondents aged 18 years or older) reported experiencing menstrual irregularities or vaginal bleeding. The data revealed two significant themes: the timing of menstruation, which accounted for 70,981 replies (83.6%), and the severity of menstrual symptoms, which accounted for 56,890 responses (67.0%). Other topics that were discussed were menopausal bleeding, which accounted for 4.0% of the responses (3,439), and the resumption of menses, which made up 2.8% of the responses (2,378). Notably, persons who reported experiencing menopausal bleeding were more likely to seek healthcare compared to those who reported other themes related to menstruation and vaginal bleeding.5

A worldwide cross-sectional survey conducted by Sarfraz A, Sarfraz Z, Sarfraz M, Nadeem Z, Felix M, and Cherrez-Ojeda I. established connections between the status and perceptions of healthcare workers (HCWs) and their knowledge regarding menstrual irregularities after immunization. Vaccinated women had a greater susceptibility to variations in the length of time between menstrual cycles, in comparison to women who were not vaccinated. Out of the 314 healthcare workers (HCWs) and 196 non-HCWs, 60 (19.1%) of the HCWs and 28 (14.3%) of the non-HCWs showed an understanding of menstrual abnormalities. In response to inquiries regarding COVID-19 vaccine-related menstrual abnormalities, 24 healthcare workers (HCWs), or 7.6% of them, compared to 9 non-HCWs, or 4.6% of them, agreed. On the other hand, 139 HCWs, or 44.3% of them, as opposed to 67 non-HCWs, or 34.2% of them, disagreed. Additionally, 151 HCWs, or 48.1% of them, in contrast to 120 non-HCWs, or 61.2% of them, either did not know the matter or chose not to respond.6

A cross-sectional study conducted in the MENA region involved 2269 female participants, with an average age of 34.3 ± 8.5 years. Approximately 66.3% of the individuals reported experiencing symptoms related to menstruation after receiving the vaccine. Out of this group, 46.7% encountered these symptoms following their initial dosage. Nevertheless, in 93.6% of the subjects, the symptoms were gone after a period of 2 months. The type of vaccine did not have a substantial impact on the occurrence of anomalies. Individuals who had previously tested positive for COVID-19 exhibited a similar rate of menstrual irregularities compared to those who did not have a COVID-19 infection or suspected symptoms and were not tested (67.5% and 66.8% respectively).

However, individuals who experienced general side effects from the COVID-19 vaccine displayed a significantly higher occurrence of abnormalities. Females exhibited a considerably higher number of problems after immunization compared to their pandemic status.2

The discrepancy between the anticipated and observed duration of the menstrual cycle was 1.9 ±3.0 days prior to vaccination, 1.6 ± 2.8 days following the initial dose, and 2.5 ± 3.8 days after the second dose (p = 0.219) for the female subjects examined in Japan. The time difference before vaccination in people who received two vaccine doses within a single menstrual cycle was 1. ± 3.5 days, while the time difference after immunisation was 3.9 ± 3.3 days. The second vaccine dose was found to have the most severe and largest proportion of side effects during the menstrual period, whereas the lowest occurrence of side effects was observed during the ovulation phase. The impact of this phenomenon was notably pronounced for symptoms such as headache and chills.7

The study conducted by Baena-García L, Aparicio VA, Molina-López A, known as the EVA project, found that out of the women involved in the research, 3,136 did not report any alterations in their menstrual cycle, whereas 11,017 (78% of the participants) reported experiencing changes in their menstrual cycle following vaccination. To summarise, the group of women who experienced menstruation alterations after receiving the vaccine tended to be older and had a little higher prevalence of smoking compared to the group of women who did not report any changes. The predominant alterations in relation to premenstrual symptoms encompassed heightened fatigue (43%), abdominal distension (37%), irritability (29%), despondency (28%), and cephalalgia (28%). The most common menstrual alterations reported were an increase in menstrual flow (43%), an intensification of menstrual pain (41%), a delay in menstruation (38%), a decrease in the number of days of menstrual bleeding (34.5%), and a reduction in the length of the menstrual cycle (32%).8

These data collectively enhance our comprehension of the complex correlation between Covid-19 immunisation and menstrual health. As we explore this subject, the complex nature of reported changes requires more investigation and emphasises the need for personalised interventions for people experiencing these differences in menstrual patterns.

DISCUSSION

The numerous completed research has unequivocally determined that covid-19 vaccinations do really result in a substantial occurrence of adverse effects on menstruation irregularities, pre-menstrual symptoms, and vaginal bleeding.

The presence of stigma around talks on menstruation health in particular populations further complicates this issue. This social stigma frequently serves as a deterrent, impeding women from openly addressing and reporting their menstrual issues. The apprehension of being stigmatized as disseminators of false information against vaccine makers exacerbates this hesitancy. Therefore, it is both scientifically necessary and socially important to do a thorough investigation on the connection between menstrual irregularities and Covid-19 vaccines. Conducting additional investigations is necessary to determine the precise cause and preventive measures, as it pertains to public health and is a topic of concern. Even in our review we haven't compared different vaccinations. So, this is the limitation of our study.

CONCLUSION

The review highlights a notable occurrence of adverse effects on menstrual health after vaccinations in young females. Reported anomalies, including changes in cycle length and symptom intensity, warrant further research beyond vaccine specifics. Findings suggest no influence based on vaccine type, emphasizing the need for broader investigations. Acknowledging social stigma, the study urges continued research despite hesitancy. While not comparing different vaccines, ongoing research is crucial for precise understanding and preventive measures. Understanding the complex link between immunization and menstrual health remains a priority in global vaccination efforts.

DECLARATION

Ethical Statement

The research conducted in this study has received approval from the Institutional Review Board/Ethics Committee at Ivane Javakhishvili Tbilisi State University. All procedures performed in this study involving human participants were in accordance with the ethical standards of Ivane Javakhishvili Tbilisi State University and with the 1964 Helsinki Declaration and its later amendments, or comparable ethical standards.

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Conflicts of Interest

The authors maintain that there are no conflicts of interest related to this research. Neither financial nor non-financial competing interests are present.

Data Availability

The data supporting the findings of this study are comprehensively presented within the article and its supplementary materials. For any additional data, interested parties may request access, and such requests will be considered.

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