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GENERAL GYNECOLOGY: ORIGINAL ARTICLE

Abnormal Uterine Bleeding Among COVID-19 Vaccinated and Recovered Women: a National Survey

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Abstract

The objective of this research was to characterize menstrual changes including amount, duration, and frequency among COVID-19 vaccinated and infected women. We conducted an online nationwide questionnaire survey on premenopausal, non-pregnant women over 18 years of age in Israel, querying about any changes in their menstrual patterns after COVID-19 vaccination or infection. In total, 10,319 women responded, of which 7904 met the inclusion criteria. Changes in menstrual patterns following COVID-19 vaccination or infection were reported in 3689/7476 (49.3%) women compared with 202/428 (47.2%) women, respectively, ($P = .387$). The most commonly described menstrual disturbance was excessive bleeding (heavy, prolonged, or intermenstrual) in both the vaccinated and infected groups, (80.6% versus 81.4%, respectively, $P = .720$). Among women who experienced abnormal uterine bleeding (AUB), in most cases (61.1%), it occurred between the vaccination and the ensuing menstrual period. Menstrual disturbances were similar in type among the vaccinated and infected women. In conclusion, AUB emerged as a side effect of the BNT162b2 vaccine and a symptom of the COVID-19 infection and was characterized mainly by excessive bleeding. Although the precise incidence could not be determined in this study, the type of bleeding disorder as well as the characterization of risk factors including increasing age and a baseline menstrual pattern of prolonged, frequent, and heavy menses are well defined. The incidence and the long-term consequences of the BNT162b2 vaccine on uterine bleeding warrant further investigation.

Keywords Abnormal uterine bleeding · Pfizer vaccine · BNT162b2 vaccine · COVID-19 · Menstrual changes

Introduction

The COVID-19 pandemic erupted in China in 2019 and has since spread worldwide. As part of the global race for a vaccine, the American pharmaceutical company, Pfizer, in collaboration with the German company, BioNTech, developed a nucleoside-modified messenger RNA (modRNA) vaccine (BNT162b2), which was the first to receive an FDA permit for emergency use [1, 2]. The vaccine has several known side effects, such as fever, fatigue, and headache [3]. However, a growing number of women have reported significant menstrual period (MP) changes classified as abnormal uterine bleeding (AUB) after being vaccinated with BNT162b2 vaccine or infected by COVID-19 [4].

The International Federation of Gynecology and Obstetrics (FIGO) defines AUB as MP bleeding abnormal in frequency (cycle length < 24 days or > 38 days), duration (≥ 8 days), quantity (light/heavy), or regularity (shortest-to-longest cycle variation ≥ 8–10 days) [5].

AUB is one of the most common reasons that reproductive-aged women seek healthcare and accounts for one-third of outpatient visits to gynecologists [6]. Its overall prevalence is approximately 3–35% [7, 8]. The reasons for this wide range are unclear and may be explained by differences in age, variety of symptoms, and most importantly underreporting. Many of the published studies on the AUB are

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restricted to estimates of the prevalence of symptoms of heavy menstrual bleeding, while other symptoms are less studied. In addition, AUB is underreported and available evidence suggests that as many as half of affected women do not seek medical care, even if they have access to a healthcare provider [7, 9].

Israel is an ideal population for research on the BNT162b2 vaccine because of its high vaccination rate (over 60% of Israel's population were vaccinated within 3 months [10]) and its exclusive use of this vaccine.

The currently available data on the impact of COVID-19 on the female menstrual cycle is limited but there is already evidence that COVID-19 infection and vaccination can alter periods [4, 11–16]. Better defining the extent and persistence of these changes will also be important in counselling women on the risks and benefits of vaccination. It is also important to determine whether any group is particularly vulnerable—for example, those with pre-existing gynecological conditions—so they can be counselled appropriately [17].

Therefore, the objective of this study was to describe and characterize MP changes after COVID-19 vaccination or infection from data derived from a large online nationwide survey.

Materials and Methods

We constructed and used a Hebrew online anonymous questionnaire addressing Israeli COVID-19 vaccinated women or women who had recovered after having been infected with the virus (for the full questionnaire see Online Resource 1). It comprised multiple-choice questions and included COVID-19 vaccination or illness status, demographic details, such as age, number of living children, height and weight, history of gynecological pathologies, contraceptive use, known coagulopathies, and anemia. The questionnaire included MP characteristics, such as regularity, frequency, duration, and volume before and after COVID-19 vaccination or infection. The questionnaire was distributed via an online link through social media (Facebook, WhatsApp, email) and directed the participants to an online anonymous Google questionnaire.

The inclusion criteria were premenopausal, non-pregnant women above 18 years of age that were vaccinated for COVID-19 by means of the Pfizer vaccine, or women who reported having sustained the COVID-19 infection. Exclusion criteria were post-menopausal and pregnant women, those who were neither vaccinated nor infected, those who were both COVID-19 vaccinated and COVID-19 infected, those whose responses either did not make sense or were incomplete, and those who could not characterize their MB.

We characterized bleeding symptoms according to the FIGO system for normal and abnormal uterine bleeding symptoms [5] and grouped them into 2 major groups: "Excessive" included heavy MB, prolonged MP, inter-MB, and frequent menstruation, or a combination of each and "Scant" included short/light, infrequent MP, or a combination of each. Since most of our study population comprised vaccinated women, we decided to focus primarily on them and compare 3 groups: "excessive," "scant," and "no abnormal bleeding."

Data analysis was performed with the use of the IBM SPSS statistic software (version 27; IBM Corporation, New York, NY). The chi-square test and the non-parametric test of trend were performed for categorical variables. Two-sided *T t*ests were used to compare continuous variables normally distributed and the Mann–Whitney test for non-parametric continuous variables. A probability value of <0.05 was considered statistically significant.

Results

An anonymous online questionnaire was distributed via an open link in the social media (Facebook, WhatsApp, email) on June 22, 2021. It had received 10,319 responses within 11 days and was closed on July 1, 2021. After exclusion of 2415 responses that did not meet the study design, 7904 responses were included in the final analysis (Fig. 1). All the vaccinated women included in our study had received the BNT162b2 (Pfizer) vaccine, and 97.2% of them were vaccinated according to the manufacturer's instructions (2 doses, 3 weeks apart).

The baseline characteristics of women with excessive, scant, or no AUB after vaccination were clinically comparable, despite age and living children, having reached a level of significance, which was attributed to the large sample size of our cohort (Table 1). The only clinically significant difference was that there were higher rates of women with fibroid uterus, endometriosis, and adenomyosis among those who reported excessive bleeding.

Almost one-half of the women had experienced AUB either after being vaccinated or after being infected with the virus (49.3% and 47.2%, respectively, $P=0.387$). Most of the women with AUB in both the vaccinated group and in the infected group described it as "excessive." The features of the bleeding were similar in both the vaccinated and infected groups (Fig. 2).

Most of the women in our study (74.9%) reported having a regular MP prior to being vaccinated (Table 2). Among the women who reported excessive AUB, there were more women with baseline MP patterns of prolonged menstruation, short intervals between MPs, and sensations of heavy volume menses compared to women who denied excessive

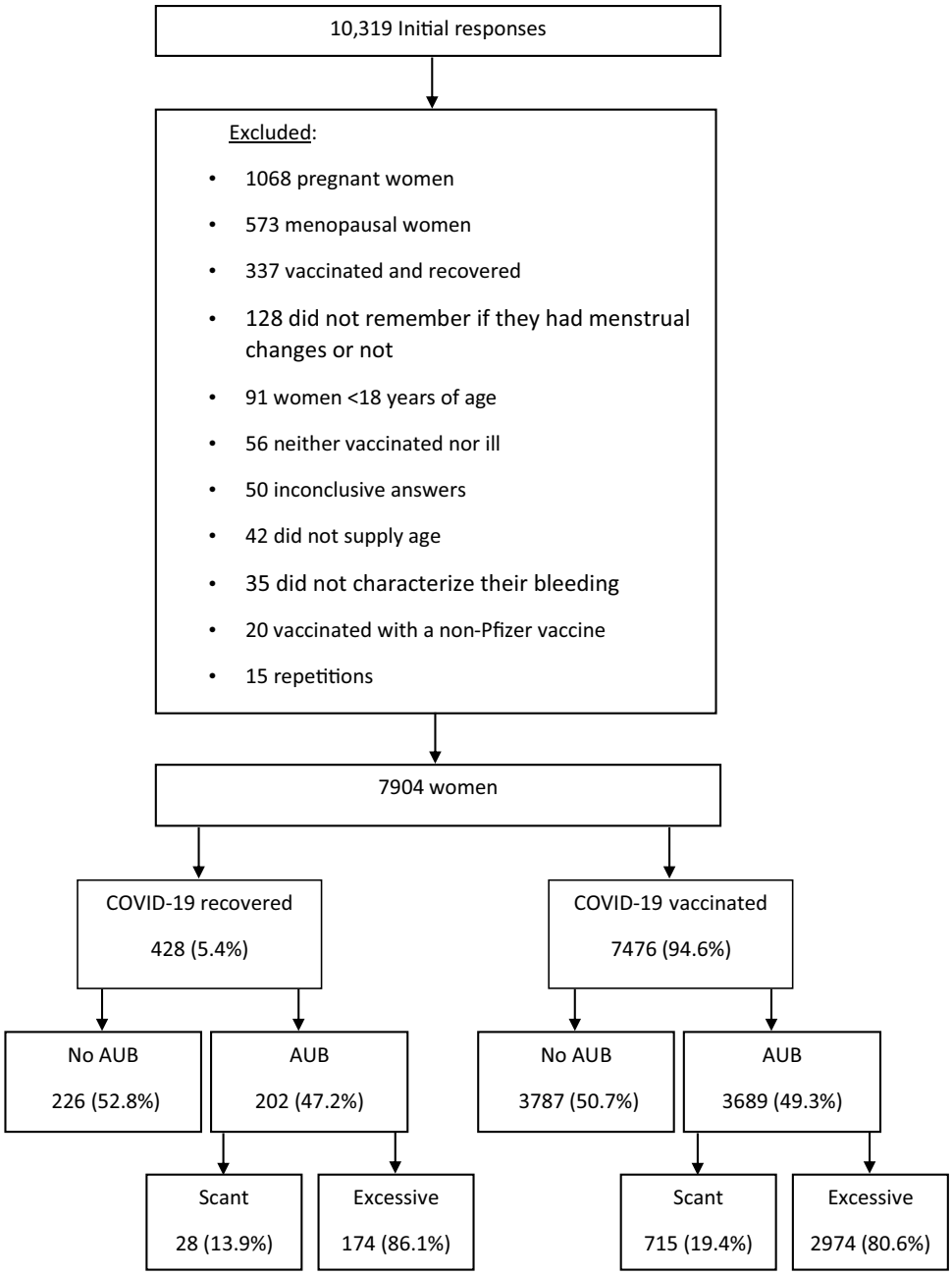

Fig. 1 Study design

bleeding after vaccination (14.2% vs 9.5%, $P<0.001$; 6.7% vs 3%, $P=0.001$; 46.4% vs 40.8% $P=0.004$, respectively).

There was also a significant correlation between AUB after vaccination and the contraceptive type the women used, with significantly more having used non-hormonal IUDs (11.8% vs 9.4%, $P<0.001$). Moreover, there were significantly more women who used hormonal contraceptives among those who reported no change in their menstrual pattern (26% vs 21.8%, $P<0.001$).

A multivariable logistic regression was performed to assess the correlation between women's vaccination/infection status and AUB occurrence. After adjusting for age, BMI, parity, fibroids, and type of AUB, this model showed that, regardless of vaccination vs. infection status, for every year of women's age there was an increased risk of 2.5% to experience AUB (adjusted odds ratio = 1.02, 95% confidence interval 1.01–1.03), and that for every child a decreased risk of 8% in the likelihood of AUB (aOR = 0.92 95% CI 0.88–0.96).

Only 2.7% of the vaccinated women in our study had not been vaccinated according to the manufacturer's protocol: 78 of them received only one dose and 128 did receive 2 doses but more than 3 weeks apart. There were no significant differences in the demographic characteristic, gynecological

Table 1 Baseline characteristics of women with and without AUB after COVID-19 vaccination

Variable	Total answered	Menstruation pattern			*P*-value
		No change ($n=3787$)	Excessive ($n=2974$)	Scant ($n=715$)	
Age, y	7476	35 (30–41)	37 (31–42)	35 (29–42)	< .001
Living children	7436	2 (1–4)	2 (1–3)	2 (0–3)	< .001
BMI (kg/m^2)	3824	24 (21–28)	24 (21–27)	24 (21–28)	.600
History of anemia	2015*/6,274	32.0	32.5	31.2	.812
Known thrombophilia	626*/7451	8.5	8.2	8.9	.825
Any gynecological disorder	891*/6931	11.6	14.7	11.9	.001
Fibroid uterus	164	1.7	2.9	1.8	.002
Endometrial polyp	58	0.7	0.8	0.7	.869
Adenomyosis	61	0.6	1.1	0.4	.032
Endometriosis	170	1.7	3.2	1.5	< .001
PCOS	60	0.9	0.6	0.8	.424
Cervical cancer	28	0.3	0.4	0.6	.431
Uterine malformation	20	0.2	0.3	0.6	.183

Data are median (interquartile range) or %

BMI body mass index, *PCOS* polycystic ovary syndrome, *AUB* abnormal uterine bleeding

*Positive out of total answered

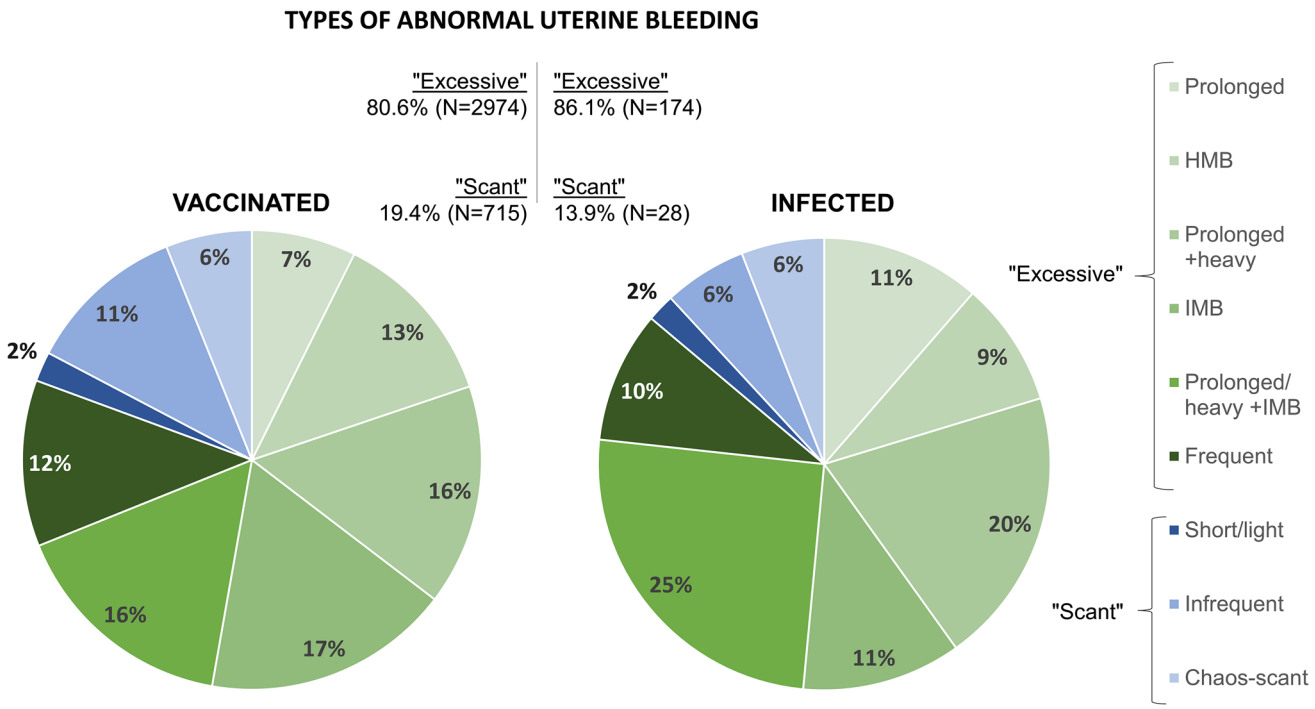

Fig. 2 Bleeding characteristics of vaccinated and infected women. Bleeding symptoms were grouped into 2 major groups: "Excessive" (HMB, prolonged MP, IMB, or in combination and frequent menstruation) or "Scant" (short/light MP, infrequent MP, or a combination of either one + IMB. HMB, heavy menstrual bleeding; MP, menstrual period; IMB, inter-menstrual bleeding)

history, menstrual pattern, and type of contraceptive used between the accurately and inaccurately vaccinated women (Table 3), although the former women experienced higher rates of excessive AUB than the latter (51% vs 36.9, respectively, $P < 0.001$).

A comparison between the COVID-19 vaccinated women to women who had sustained infection by the virus revealed that most of the baseline gynecological pathologies, menstrual characteristics, and contraceptive type were similar for both groups (Table 4). There were no significant differences

Table 2 Menstrual characteristics and contraceptive use of women with and without AUB after COVID-19 vaccination

Variable	Total responders ($n=7476$)	Menstruation pattern			*P*-value
		No change (%) ($n=3787$)	Excessive (%) ($n=2974$)	Scant (%) ($n=715$)	
Menstrual regularity	7465				
Regular	5591	72	77.9	77.6	**<.001**
Irregular	901	10.1	13.3	17.4	.003
Amenorrhea	973	17.9	8.8	5	.005
Menstrual frequency	6468				**<.001**
Short < 24 day	294	3	6.7	3.1	.001
Normal 24–38 day	5677	88.5	87.1	87.2	.209
Prolonged > 38 day	497	8.5	6.3	9.7	.003
Menstrual duration	6485				**<.001**
Prolonged ≥ 8 days	760	9.5	14.2	11.9	<.001
Normal < 8 days	5367	86	78.7	84.3	.002
Variable	358	4.5	7	3.9	.004
Flow volume sensation	6482				**<.001**
Normal	2963	47.3	43.7	46.6	.017
Heavy	2790	40.8	46.4	39.9	.004
Could not be determined	729	11.9	10	13.5	.030
Contraceptive type	7428				**<.001**
None/condom/diaphragm	4946	64.6	66.4	77.5	<.001
Hormonal pills/hormonal IUD	1729	26	21.8	15	<.001
Non-hormonal IUD	753	9.4	11.8	7.5	<.001
Breastfeeding	**152**	26.9	17.4	10.9	<.001

Bold numbers indicate total numbers/combined *P*-value

Excessive heavy, prolonged, or inter-menstrual bleeding, *Scant* weak or prolonged interval between menstrual periods, *AUB* abnormal uterine bleeding, *IUD* intrauterine device

Table 3 Background and gynecologic characteristics of women after accurate vs. inaccurate COVID-19 vaccination protocols

Variable	Total responders ($n=7476$)	Accurate vaccination ($n=7270$)	Inaccurate vaccination ($n=206$)	*P*-value
Age (y)	7476	36 (30–42)	35 (30–40)	.329
Living children	7436	2 (1–3)	2 (1–3)	.942
BMI	3824	24 (21–28)	23 (20–27)	.059
Gynecological pathologies	891*/6926	12.8	14.7	.434
Regular menstruation	5591*/7465	74.8	77.2	.688
Normal menstrual interval	5677*/6031	87.7	89.5	.771
Normal menstrual duration	5367*/6485	82.9	78.6	.310
Normal **f**low volume sensation	2963*/6482	45.6	50	.169
Contraceptive type	7428			**.049**
None/condom/diaphragm	4946	66.4	74.3	.019
Hormonal pills/hormonal IUD	1729	23.4	19.8	.176
Non-hormonal IUD	753	10.2	6.4	.077
Breastfeeding	**1532*/7070**	21.6	23.6	.458
AUB	**7476**			**<.001**
None	**3516**	46.7	58.7	.001
Excessive	**3787**	51	36.9	<.001
Scant	**173**	2.3	4.4	.047

Bold numbers indicate total/combined *P*-value

Accurate vaccination—2 doses 3 weeks apart, *Inaccurate vaccination* 1 dose or 2 doses more than 3 weeks apart, *Excessive* heavy, prolonged or inter-menstrual bleeding, *Scant* weak or prolonged intervals between menstrual periods, *AUB* abnormal uterine bleeding, *BMI* body mass index, *IUD* intrauterine device

Table 4 Background and gynecologic characteristics of women after vaccination vs COVID-19 infection

Variable	Total responders ($n=7904$)	Women after vaccination ($n=7476$)	Women after infection ($n=428$)	*P*-value
Age (y)	7904	36 (30–42)	35 (28–40)	.001
Living children	7863	2 (1–3)	3 (1–5)	< .001
BMI	4005	24 (21–28)	23 (21–28)	.933
Gynecological pathologies	944*/7319	12.9	13.5	.721
Regular menstruation	5910*/7892	74.9	74.7	.930
Normal menstrual interval	5984*/6856	87.8	79.1	< .001
Normal menstrual duration	5678*/6874	82.8	79.9	.118
Normal **f**low volume sensation	3179*/6871	45.7	45.2	.148
Contraceptive type	7848			**.001**
None/condom/diaphragm	5217	66.6	64.5	.384
Hormonal pills/hormonal IUD	1812	23.3	19.8	.096
Non-hormonal IUD	819	10.1	15.7	< .001
Breastfeeding	1639*/7454	21.7	27.9	.004
Timing of the AUB	3792			**.005**
Immediately	2318	60.7	69.3	.015
Until the next period	896	24.2	14.1	.001
After the next period	578	15.2	16.6	.589
AUB	7904			**.112**
None	4013	50.7	52.8	.387
Excessive	3148	39.8	40.7	.720
Scant	743	9.6	6.5	.037

Bold numbers indicate total/combined *P*-value

Excessive heavy, prolonged, or inter-menstrual bleeding, *Scant* weak or prolonged intervals between menstrual periods, *AUB* abnormal uterine bleeding, *BMI* body mass index, *IUD* intrauterine device

in their overall AUB rates (49.3% vs 47.2%, $P=0.387$) except for the scant bleeding subgroup (9.6% vs. 6.5%, $P=0.037$), which composed fewer than 10% of the entire cohort.

Discussion

We quantified and evaluated an important side effect of the BNT162b2 vaccine on menstrual cycle changes. These changes were mainly characterized by excessive bleeding that occurred in the timeframe between the vaccination and the subsequent menstrual period. Women who reported excessive bleeding were characterized by a history of extended and heavy menses, a greater use of non-hormonal IUDs, and by having been vaccinated according to protocol at higher rates compared to those who experienced no or scant bleeding.

Given our goal to reach a large population of women in a short period of time, we opted to use an online questionnaire. This method has inherent advantage and disadvantage; it is intended to be simple and brief in order to reach a high response rate. Indeed, in 10 days we got more than 10,000 responses. The questionnaire was conducted in June 2021, 6 months after the beginning of the vaccination campaign in Israel and 3 months after it reached its peak [10]. It is reasonable to assume that most of the women responded to the questionnaire between 3 to 6 months after vaccination, while the experience was still fresh in their memory thus reducing recall bias, and at the same time enabled perspective of a periodic side effect.

Anonymous questionnaires are subject to authenticity issues, such as anti-vaccine groups that might try to tamper with the results. In order to deal with this issue, we closely monitored the type of answers and their timing. Demographic information, such as age, height, weight, and marital status was used to identify repeat responders and delete them. In addition, we applied multiple filters in Excel™ to find suspicious or illogical answers, and only 50 of the latter responses (0.48%) were deleted. An example of non-valid and deleted questionnaire is one that contained 2 consecutive responses where the participant selected all the possible menstrual abnormalities after vaccination.

Besides authenticity issues, questionnaires are susceptible to selection bias. This format may attract women who feel that the vaccine/infection affected their menses, so women who experienced AUB after vaccination/infection may be more likely to participate. Therefore, we

were unable to conclude the exact incidence of AUB from this study. Moreover, young women are more involved in social media, whereupon their participation would be much higher than their older counterparts.

The psychological element of fear from the new vaccine can be another source of bias, since women might attribute every untoward physical event around the time of vaccination as being vaccine-related. Nonetheless, we believe that having so many similar experiences from thousands of women in such a short period of time is a convincing argument. Despite its limitations, our study reached a large sample size, and the fact that bleeding disturbances were distributed in the same manner among the vaccinated and the COVID-19-infected women in both the univariate and multivariate analyses further strengthens our findings.

To date, little has been published in the literature about AUB after vaccination or infection with COVID-19, and the available findings are inconsistent. This phenomenon was overlooked at first by vaccine manufacturers, but as reports accumulated, awareness increased. According to the British Yellow Card reporting system more than 50,000 suspected reactions relating to a variety of menstrual disorders have been reported after all the three types of the COVID-19 vaccines that were administered in the U.K. [18]. This concern was also raised in the U.S., where the National Institutes of Health allocated $1.67 million for research into a possible connection [19]. A study from the Norwegian Institute of Public Health asked a pre-existing cohort of 5688 Norwegian women whether they had experienced specific menstrual changes in the cycles before and after each vaccine dose [14]. Overall, 37.8% of women reported any menstrual disturbance prior to vaccination. The relative risk for heavier bleeding during the exposed compared to the unexposed period was 1.9, 95% CI: 1.69–2.13 for the first dose and 1.84 95% CI: 1.66–2.03 for the second dose.

In an anonymous digital survey from March 2021, which included 1031 women, 46% reported a change in their menstrual cycle since the beginning of the pandemic. About 18% reported new menorrhagia and 9% reported missed periods [15]. However, participant's infection/vaccination status was not mentioned, and menstrual changes were attributed to stress caused by the pandemic. Li et al. [4] reported on 177 women with COVID 19 infection, 25% of which presented with menstrual volume changes, and 28% with menstrual cycle changes, mainly decreased volume, and a prolonged cycle. These results are in contrast with our findings that over 80% of women who reported AUB described it as excessive. This discrepancy may reflect the relatively small sample size in these studies, the fact that they were done early in the pandemic and reported on women diagnosed with COVID-19 exclusively without characterizing the effect of vaccination on menstruation.

In previous questionnaire studies, some reported similar results to ours. For example, the MECOVAC study was an online questionnaire which excluded women with gynecological and non-gynecological diseases, undergoing hormonal and non-hormonal treatments, perimenopause or menopause women, as well as those who had irregular menstrual cycles in the last 12 months before vaccine administration. They found that, approximately 50–60% of reproductive-age women who received the first dose of the COVID-19 vaccine reported menstrual cycle irregularities, regardless of the type of vaccine. The occurrence of menstrual irregularities seems to be slightly higher (60–70%) after the second dose [20]. On the other hand, some questionnaire studies had conflicting results to ours. For example, in an online questionnaire among vaccinated Saadians, abnormal menstrual cycle was reported in only 0.98% (18/1846) of Pfizer-BioNTech and 0.68% (7/1028) of ChAdOx1 vaccines [16]. The low rate of this side effect in this study may be attributed to the fact the questionnaire was open to both genders, with no age limit and inquired on up to the 7th day post vaccination. In a recent prospective study, Edelman et al. [13] analyzed menstrual cycle data from three consecutive cycles before and after the vaccine or, if unvaccinated, six cycles over a similar time period. They included 3959 women and found that COVID-19 vaccine was associated with a less than 1-day change in cycle length, and no change in menses' length. Our study differs since we examined a composite of several other menstrual characteristics such as inter-menstrual bleeding (IMB) and heavy menstrual bleeding (HMB) that were not examined in the study of Edelman et al.; moreover, our study population was more heterogenic, including women who use contraceptives and women with irregular menses.

In our study, menstrual disturbances were similar in type and distribution among the vaccinated and infected women. One possible explanation for this finding relies upon a common mechanism. The vaccine's side effects and the symptom of the viral infection are similar. For example, the BNT162b2 vaccine can cause fever, fatigue, and headache [3], as does the disease. The exact mechanism of the association between COVID-19 vaccines/infection and menstrual changes is not fully understood. It is known that many ovulatory dysfunctions can be traced to endocrinopathies by their disruption of the hypothalamic-pituitary-ovarian axis. There are several known triggers for this disruption, including mental stress [21], viral infections [22], and systemic diseases that cause gonadal dysfunction as a result of immunological influences [23]. In addition, COVID-19 infection and its vaccine are both associated with coagulopathies that may result in either bleeding and thrombocytopenia [24, 25] or hyper-coagulation and thrombosis [26–28]. Moreover, menstrual changes have been reported not only after mRNA vaccine but also after adenovirus vectored COVID-19 vaccines

[18] and after human papillomavirus (HPV) vaccine [29], suggesting an immune mechanism rather than a reaction to a specific vaccine component.

Age is an important parameter when addressing abnormal menstrual bleeding. Most irregular bleeding occurs during the 5th decade of life [5]. In addition, woman's body mass index (BMI) is also known to greatly affect the regularity of menstruation [30, 31] as well as the normalization of ovulation [32]. In our study, women with and without AUB had similar baseline characteristics in both age and BMI. This further strengthens the relation between AUB and the COVID-19 vaccination and infection since these possible outliers were equally distributed between our study groups.

The women's background bleeding pattern is pivotal when considering AUB as a vaccine side effect or one of the disease symptoms. Most of the women in our study had normal menses in terms of regularity, frequency, duration, and volume. It would be more difficult for women with an irregular menses pattern to detect any changes or lack of them, and, indeed, there were significantly more women in our study with a regular pre-pandemic MP who reported having experienced AUB compared with those who reported no menstrual change after vaccination or infection.

COVID-19 vaccination or infection increased the women's baseline bleeding tendency. Specifically, among those who reported excessive bleeding after vaccination, there were significantly more women with a history of prolonged/heavy menstruation and more of them used non-hormonal IUD (which is known to be associated with heavy menstrual bleeding [33]). Conversely, women who reported no change in their menstrual bleeding had a higher rate of hormonal contraceptive use and breastfeeding, which are associated with reduced menstrual volume [34].

Although we are still awaiting definitive evidence about the association between COVID-19 and menstrual changes, clinicians continue to encounter everyday women who have experienced these effects, and need to be able to counsel them properly. This information will allow women to plan for potentially altered cycles and will be particularly important for those who rely on being able to predict their menstrual cycles to either achieve or avoid pregnancy [35].

Conclusions

Abnormal uterine bleeding is an apparently common side effect of the BNT162b2 vaccine as well as of the COVID-19 infection. It is characterized mostly by excessive bleeding and most women experienced it between vaccination date and the next menstrual period.

Israel is currently experiencing a 5th COVID-19 outbreak, and a BNT162b2 booster vaccine had been provided to people over 12 years of age. Since COVID-19 and its vaccines will apparently continue to impact our world in the foreseeable future and given that other countries may also adopt a booster vaccine policy, we recommend that women should be informed about possible menstrual changes after vaccination and be encouraged to report any changes or unexpected vaginal bleeding to the formal side-effect reporting systems. Future studies on COVID-19 vaccines are warranted in general and even more so in selected populations, such as pubertal girls, pregnant women, and menopausal women, in order to allay fears about potential side effects.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s43032-022-01062-2.

Author Contribution All the authors contributed to the study conception and design. Data collection was performed by Gal Issakov and Tamar Tzur. Analysis was performed by Yossi Tzur. The first draft of the manuscript was written by Gal Issakov, Yossi Tzur, and Tamar Tzur. Talia Friedman took part in manuscript editing, and all the authors commented on the previous versions of the manuscript. All the authors read and approved the final manuscript. Gal Issakov and Yossi Tzur contributed equally to this work.

Declarations

Ethics Approval The study was approved by Laniado Hospital's Ethical Committee (LND-0030–21).

Consent to Participate Informed consent to participate in this anonymous survey was assumed by acceptance to do so.

Conflict of Interest The authors declare no competing interests.

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