Stress Induced Menstrual Cycle Irregularities AMIDST the Pandemic

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This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: The global pandemic of the coronavirus disease 2019 (COVID-19) has yielded a variety of stressors (psychosocial) for the population, particularly women. The elevated stress may not only affect the wellbeing and health (physical and mental) of women, but also the reproductive status and menstrual cyclicity.

Objective: To determine the plausibility and mechanism via which stress (emanating from the COVID-19 pandemic) has impacted women’s menstrual cyclicity.

Methodology: This descriptive, cross-sectional study was conducted from Sept 2020 to August 2021 upon a randomly selected sample of 1450 Pakistani women (aged 18 to 40 years). The data was collected using an online questionnaire containing enquiries pertaining to basic biodata, sociodemographic details, lifestyle patterns, medical & reproductive history, and stress score measured via the COVID-19 Stress Scales (CSS). The data obtained, was analyzed using SPSS v. 21.0.

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Results: Among the females, 741 reported regular menstrual cycles, while the remaining 709 reported a disturbed menstrual cyclicity. The commonest changes included early or late start of the cycle (227), more aggravrated menstrual symptoms (e.g., cramping, discharge and low back pain) (205), and menorrhagia (277). Individuals with aggravated symptoms of ill-timed cycles scored higher (cumulatively as average scores) on the CSS compared to their counterparts ($p < 0.05$).

Conclusion: After careful consideration of the results, it can be concluded that a significant association exists between the stress (emanating from the COVID-19 pandemic) and menstrual irregularity ($p < 0.05$). Stress relief may help alleviate menstrual irregularities in the current scenario.

Keywords: Coronavirus disease 2019; COVID-19 stress scale; menstrual cyclicity; pandemic & stress.

1. INTRODUCTION

A timely routine menstrual cycle is an indication of a healthy woman with a well-functioning axis of hypothalamus – pituitary gland – and gonads (HPG) [1]. Disturbances in the axis manifest as irregularities of the menstrual cycle, such as abnormal (infrequent, irregular, ill-times and intense) menstrual pattern with bleeding noted in intermenstrual period as well [2]. Women experiences irregularly patterned menses, are more likely to develop cardiovascular ailments, chronic renal failure, neoplasia, diabetes mellitus, and, premature menopause, and also sub-fertility [3 - 5].

Research has revealed that a global prevalence of 5% to 34% for irregularities of menstruation during childbearing years” [6]. Among the many reasons for presentation to a gynecologist’s office, an improper menstruation takes the lead [7]. Many factors may contribute to changes in the pattern of menstruation, such as, major factors (medication, coagulopathy, structural anomaly, ovulatory dysfunction), and minor factors (acute weight loss, over-exertion, smoking, obesity, psychological problems) [8, 9]. Menstrual cycle irregularities are not only related to future chronic health problems but also adversely affect the quality of life, work productivity and add a financial burden on health systems [10].

Literature notes that “in December 2019 severe acute respiratory tract infection, the coronavirus disease 19 (COVID-19) originating at Wuhan city of China, rapidly spread all over the world and led to a global risk to public health. World Health Organization declared the COVID-19 outbreak as a pandemic on March 11, 2020”, [11] and resultantlly, an estimated 1.46 million cases of COVID-19 were reported locally (in Pakistan), and approximate 29,478 deaths were recorded [12]. Public health scientists reiterate that “widespread epidemics are not only associated with physical health concerns but also pose a significant threat to mental health” [13]. This is not an isolated scenario and globally, stress, anxiety, and depression were reported among, 29.6%, 31.9%, and 33.7%, individuals in the global population respectively [14].

The onset of psychological distress and the eventual emergence of menstrual cycle irregularities is studied very rarely. This research shall determine if and how stress (emanating from the COVID-19 pandemic) has impacted women's menstrual cyclicity.

2. METHODOLOGY

This descriptive, cross-sectional study was conducted from Sept 2020 to August 2021 upon a randomly selected sample of 1450 Pakistani women (aged 18 to 40 years). The data was collected using an online questionnaire containing enquiries pertaining to basic biodata, sociodemographic details, lifestyle patterns, medical & reproductive history, and stress score measured via the COVID-19 Stress Scales (CSS). The data obtained, was analyzed using SPSS v. 21.0. T-Test was used to find difference in mean scores of Covid’19 Stress Scale between women with regular and irregular cycles.

2.1 Inclusion Criteria

1. Women aged 18 to 40 years
2. Women with regular menstrual cycles for more than 1 year prior to the pandemic

2.2 Exclusion Criteria

1. Women who are pregnant, post-partum or breastfeeding
2. Women on hormone medication or medication affecting menstrual patterns
3. Women with intrauterine device
4. Women with bleeding disorders
5. Women with thyroid disease or hyperprolactinemia
6. Women who have undergone hysterectomy and/or oophorectomy
7. Women with major psychiatric disorders

3. RESULTS

The mean age of the sample stood at 31 ± 4 years (range: 18 to 40) with a predominance of urban diaspora and a middle socioeconomic status. A summary of the descriptive statistics is tabulated.

Table 1 The descriptive statistics show that a majority of the sample population is comprised of married middle aged women hailing from an urban background and belonging to a middle socioeconomic class of the society.

Among the females, 741 reported regular menstrual cycles, while the remaining 709 reported a disturbed menstrual cyclicity.

Table 1. Descriptive statistics

| Variable                     | Statistic | n (%)         |
|------------------------------|-----------|---------------|
| Mean Age (Years)             | Urban     | 909 (62.7%)   |
|                             | Rural     | 541 (37.3%)   |
| Residential Status           | Lower     | 614 (42.4%)   |
| Socioeconomic Status         | Middle    | 629 (43.4%)   |
|                             | Upper     | 207 (14.2%)   |
|                             | Single    | 488 (33.7%)   |
| Marital Status               | Married   | 853 (58.8%)   |
|                             | Separated | 109 (7.5%)    |
| Parity                       | 0         | 227 (15.6%)   |
|                             | 1         | 380 (26.2%)   |
|                             | 2 or more | 843 (58.2%)   |

Table 2. Menstrual cyclicity

| Variable        | Statistic | n (%)         |
|-----------------|-----------|---------------|
| Menstrual Cyclicity | Regular | 741 (51.1%)   |
|                 | Irregular | 709 (48.9%)   |

Table 2 The menstrual cyclicity of nearly half of the sample population was disturbed.

The commonest changes included early or late start of the cycle (227), more aggravated menstrual symptoms (e.g., cramping, discharge and low back pain) (205), and menorrhagia (277).

Individuals with aggravated symptoms of ill-timed cycles scored higher (cumulatively as average scores) on the CSS compared to their counterparts \( (p < 0.05) \).

| Variable              | Mean CSS Score | P Value |
|-----------------------|----------------|---------|
| Menstrual Cyclicity   |                |         |
| Regular               | 71 ± 04        |         |
| Irregular             | 106 ± 13       | < 0.05  |
4. DISCUSSION

Phelan, et al argues that “although it is well understood that increased psychosocial stress can result in menstrual cycle irregularities, very little emphasis is laid on the issue. He reports that 46% of women self-reported an increase in menstrual cycle irregularities during the COVID-19 pandemic”. This does hold true for our locality as well, since ours is among the first research to investigate this matter. In addition to the beliefs, our research shares similar results and associates menstrual irregularities with covid related stress [15].

There is a widespread belief that the pandemic has been difficult for many individuals, and women have been affected more oftentimes, due to a variety of factors. In particular, Almeida, et al, states that “given the unprecedented nature of the COVID-19 pandemic and its psychosocial impact, it is unsurprising that women may experience disruptions in menstrual cyclicity similar to other acute life stressors or natural disasters” [16]. Nagma, and Vannucinni have formerly investigated the relationship between menstrual irregularity and overbearing stress and noted that perceived stress scores are oftentimes higher among individuals with menstrual irregularity [17] and menorrhagia [18].

This research categorically notes that the probability of menstrual disturbances is higher among women yielding a high CSS score. It is however interesting to note that regardless of the CSS score, our study sample (in its entirety) did display some sort of menstrual irregularity (during the pandemic); giving support to the stance that menstrual irregularities are naturally rife in this local populace and have been aggravated during the pandemic.

Barelo, et al. [19] stressed that “psychosocial stress and other mental health disorders have been associated with changes in the duration, corresponding to the number of days of menstrual bleeding, and quantity of menses that is reflected in heavier or lighter bleeding patterns”. It was also noted by Xiong, et al. [20] that “women with self-perceived high stress jobs have reported both longer and shorter durations of menses”. Shi et al, on the other hand suggests that “women who suffer from depression have separately reported longer durations of menses [21]. In this study, we find that COVID-19-related stressors may also be a contributing factor in menstrual cycle changes, as more than half of all women with higher CSS scores reported a change in the duration of menses” [21].

In addition, respondents noted significant changes in menstrual bleeding during the COVID-19 pandemic. Morin et al. linked “abnormal bleeding patterns and other menstrual irregularities to stress in adolescent and young adult populations”. Morin claimed that it is fair to assume that “stress may be contributing to alterations in menstrual bleeding patterns among adult populations as well” [22].

Grieger et al. noted that “menstrual cycle variation is not significant between women in their 20s and early 30s but is more common among women aged 35 years and older” [23]. In this research, the average age of respondent was 31 years and a valid proportion of the respondents aged higher than the average age, hence the said effect may be minimal.

5. CONCLUSION

The findings concluded that a significant association exists among the women with irregular menstrual cycles and Stress due to Covid’19 (p < 0.05). Stress relief may help alleviate menstrual irregularities in the current scenario.

CONSENT AND ETHICAL APPROVAL

Ethical approval before starting the study and informed written consent was taken from each participant.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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