



## CASE REPORT

# Premenstrual Syndrome, Progesterone and its Impact on Female Wellbeing and Work Productivity

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## Introduction

Premenstrual Syndrome (PMS) is defined as the recurrence of psychological and physical symptoms during the luteal phase that remit during the follicular phase of the menstrual cycle. PMS occurs in ovulatory cycles, and progesterone may be the underlying cause or at least the triggering factor of symptoms in susceptible women [1]. Progesterone levels rise during ovulation and decline before menstruation; several studies suggest that Premenstrual Syndrome (PMS) may be caused by progesterone deficiency [2]. Therefore, bioidentical hormones are of great importance, as they are chemically and structurally identical to endogenous hormones, facilitating their metabolism.

The global prevalence of PMS is estimated at 47.8 [3], while its most severe form, Premenstrual Dysphoric Disorder (PMDD), affects 3-8% of women of reproductive age [4]. Up to 91% of women report that their productivity is affected by these symptoms, which typically appear one week before menstruation. Menstrual discomfort leads 45% of women to miss work for several days or hours. In Mexico, 24,049,349 women are part of the labor force, representing 40% of the total workforce. Among them, 48% experience symptoms ranging from intense to disabling.

Official data from the Mexican Social Security Institute (IMSS) report an average of only 11 disability leaves per month among 554 women due to diagnoses such as menstrual pain, endometriosis, dysmenorrhea,

or dysphoria. This figure comes from a total of 9,066,310 insured women registered with the Institute as of November 2024. Overall, IMSS reports an average of 1,653 days of disability leave per month, which corresponds to an average of 2.98 days per woman [5].

## Materials and methods

An internal recruitment was conducted within the company OmicronLab, where medical histories were obtained using a Premenstrual Syndrome (PMS) screening questionnaire consisting of 76 questions. Eleven women who reported experiencing moderate to severe symptoms during their menstrual cycle, as well as a perceived decrease in work productivity, were included. A physician clinically reviewed the symptom questionnaires and determined that only six participants met the criteria for PMS. Clinical follow-up was conducted for approximately one year for these patients using a 30-question survey focused on PMS and Bioidentical Hormone Replacement Therapy (BHRT). Each patient received topical progesterone cream for one year at a nightly dose ranging from 50 to 100 mg/g.

## Results

To synthesize the data from the volunteers, only the two most representative cases-those with the most severe initial symptoms and the greatest symptom reduction throughout the study-were selected and represented through heat maps. In volunteer 2 (Figure 1), a higher concentration and greater intensity of

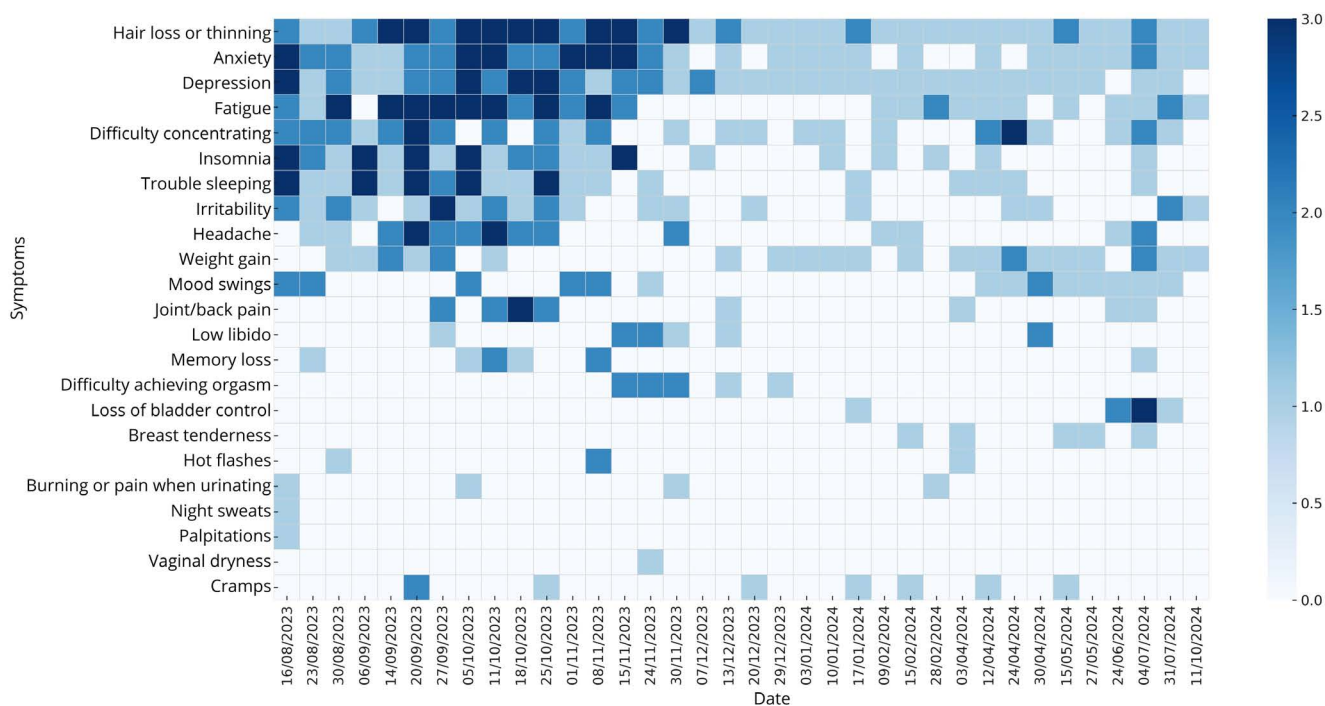


Figure 1: PMS in Volunteer 2.

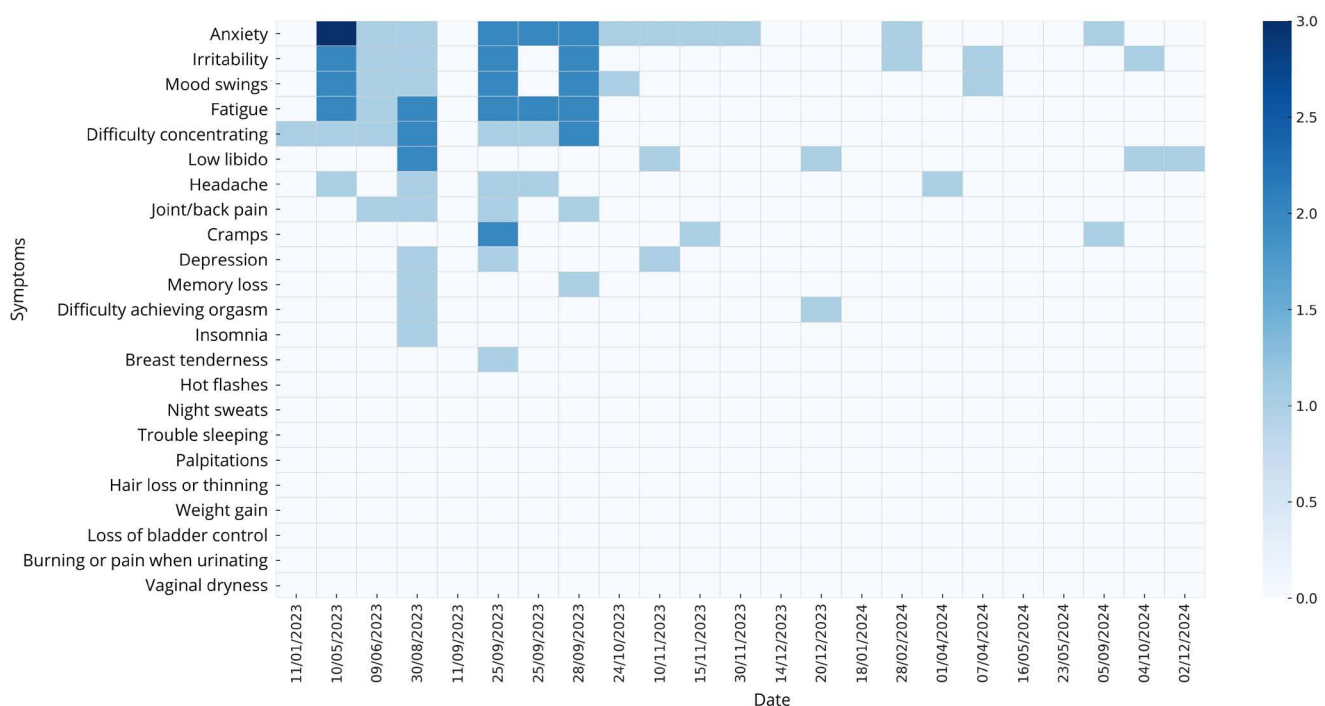


Figure 2: PMS in Volunteer 3.

symptoms were observed during the first three months, followed by a monthly progressive decrease in both the number and intensity of symptoms, reaching stabilization by month 14. The patient reported acne and fatigue during the first four months, followed by a reduction in menstrual bleeding and a shortened period duration to three days.

In volunteer 3 (Figure 2), a higher number and intensity of symptoms were also observed during the

first three months, followed by a gradual monthly reduction until month 11. The patient reported significant improvement starting from the third month. Symptoms shown in gray represent those that were never experienced.

## Discussion and Conclusion

Hormonal treatment reduces fluctuations of sex hormones throughout the menstrual cycle, thereby mitigating adaptive changes in the central

nervous system that occur under the influence of progesterone and estrogen derivatives. Theoretically, this could eliminate symptoms in women who are particularly sensitive to hormonal fluctuations. Progesterone is a steroid hormone metabolized into 3 $\alpha$ ,5 $\alpha$ -tetrahydroprogesterone (3 $\alpha$ ,5 $\alpha$ -THPROG; allopregnanolone), which regulates several functions in the brain, spinal cord, and sciatic nerve—such as myelination, neuroprotection, and neuropathic pain. Due to its small molecular size and lipid solubility, circulating progesterone easily crosses the blood–brain barrier [6]. Maladaptive responses of gamma-aminobutyric acid (GABA-A) receptors to allopregnanolone may be prevented by avoiding progesterone peaks [7,8]. The elimination of these progesterone surges could increase serotonin levels in women suffering from PMS [9,10].

In the present study, topical progesterone was administered to six patients for approximately one year. One patient withdrew halfway through due to initiation of another hormone treatment for fertility purposes. A significant improvement in symptom scores between the beginning and end of the study was observed in 50% of participants. All volunteers reported overall well-being and improvement in their premenstrual symptoms by the end of the study.

All participants (100%) reported satisfaction with the study, as well as improvement in quality of life, performance, and work productivity. Dalia Empower & Plenna [11] reported that in Mexico, 45% of surveyed women have missed or attempted to miss work due to menstrual discomfort and associated symptoms, while 48% have left work early or reduced hours. It is worth noting that Mexico's GDP could be 15% higher by 2030 if government and private-sector initiatives facilitated the inclusion of 8.2 million more women in the economy. However, beyond inclusion, addressing women's basic health needs is essential<sup>11</sup>. PMS and PMDD are not merely symptom complexes; they significantly affect quality of life through increased stress, greater difficulty performing daily activities, anxiety, interpersonal sadness, reduced perceived sleep quality, unhappiness, and higher psychiatric comorbidity—all of which directly impact personal life and occupational productivity [12,13].

In summary, identifying the clinical presentation of PMS or PMDD is crucial for the safe clinical management of affected women. Personalized transdermal bioidentical hormone replacement therapy with progesterone, at doses ranging from 50 to 100 mg/g according to symptom severity, represents a key approach to mitigating premenstrual progesterone peaks, increasing serotonin levels, reducing symptoms, and ultimately improving both productivity and quality of life.

## Conflict of Interest

The authors declare no conflicts of interest.

## Informed consent

All volunteers provided informed consent for the preparation of this case series.

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