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An Overview on Hormonal Therapy in Premenstrual Syndrome

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ABSTRACT:

Premenstrual syndrome is marked by the presence of physical and behavioural symptoms that recur frequently in the second half of the menstrual cycle and interfere with multiple aspects of the woman's life. Affective symptoms such as depression, anger, and anxiety, as well as somatic symptoms such as breast soreness, bloating and swelling, and headache, are among the primary symptoms of premenstrual syndrome. Prior to considering treatment, an accurate diagnosis of premenstrual syndrome should be established. The therapy goals for premenstrual disorders patients are to alleviate symptoms and improve functional impairment. A broad range of approaches, including lifestyle changes (exercise and relaxation techniques), cognitive behavioural therapy, and medications (selective serotonin reuptake inhibitors and/or combined oral estrogen-progestin contraceptives) may be beneficial for women in the prevention and management of premenstrual syndrome. The present paper highlights the hormonal therapies to be considered in premenstrual syndrome.

Keywords: Premenstrual syndrome; Hormone Therapy; Estrogen; Progesterone

INTRODUCTION:

Premenstrual syndrome (PMS) is a disruptive set of emotional and physical symptoms that regularly occur in the one to two weeks before the start of each menstrual period.It encompasses clinically significant somatic and psychological manifestations during the luteal phase of the menstrual cycle, leading to substantial distress and impairment in functional capacity. These symptoms disappear within a few days of the onset of menstruation. The pooled prevalence of reproductive age women affected with PMS worldwide amounts to 47.8%.Among these, about 20% of women experience symptoms severe enough to disrupt their daily activities, and the remaining have mild to moderate symptoms. [1]

EPIDEMIOLOGY:

Established studies showed that an estimated 90% of females of reproductive age were impacted by mild to acute premenstrual symptoms. Among them, about 20% to 40% encounter PMS, while 2% to 8% experience premenstrual dysphoric disorder, a severe type of premenstrual syndrome, characterized by cyclical mood alterations leading to clinically marked distress, as well as functional impairment.The rate of PMS is believed to be high among this population, and it adversely affects their life and academic performance. The prevalence of PMS among the university students of different countries are as follows; for example, 33.82% in China, 37% in Ethiopia, 39.9% in Taiwan, 65% in Egypt, 72.1% to 91.8% in Turkey, and 79% in Japan.

Two risk factors for PMS are obesity and smoking. Research reveals that women with a body mass index of 30 or above are nearly three times as likely to have PMS than women who are not obese. Women who smoke cigarettes are more than twice as likely to have more severe PMS symptoms. [2]

SIGNS AND SYMPTOMS:

Any disruptive, cyclical symptom could be a symptom of PMS, and some sources have suggested that the number of claimed symptoms could exceed even 200. The exact symptoms and their intensity vary significantly from person to person, and even somewhat from cycle to cycle and over time. Most people with premenstrual syndrome experience only a few of the possible symptoms, in a relatively

predictable pattern. Additionally, which symptoms are accepted as evidence of PMS varies by culture. Commonly reported symptoms in women with premenstrual syndrome include: [3]

- Psychological symptoms: Irritability, depression, crying/tearfulness, anxiety, tension, mood swings, lack of concentration, confusion, forgetfulness, unsociableness, restlessness, temper outbursts/anger, sadness/blues, loneliness
- Behavioural symptoms: Fatigue, dizziness, sleep/insomnia, decreased efficiency, accident prone, sexual interest changes, increased energy, tiredness
- Physical symptoms: pain, Headache/migraine, breast tenderness/soreness/pain/swelling (collectively known as premenstrual mastalgia), back pain, abdominal cramps, general pain
- Physical symptoms: bloating and swelling, Weight gain, abdominal bloating or swelling, oedema of arms and legs, water retention
- Appetite symptoms: Increased appetite, food cravings, nausea

PATHOPHYSIOLOGY AND AETIOLOGY:

The pathophysiology of premenstrual syndrome is complex, imprecise, and is not fully understood. [4]

- Women with PMS often have an exaggerated response to normal hormonal changes; although their levels of estrogen and progesterone are similar to those of women without PMS, rapid shifts in levels of these hormones promote pronounced emotional and physical responses
- It is anticipated that PMS is likely to be influenced by the action of progesterone on neurotransmitters like gamma-aminobutyric acid (GABA), opioids, serotonin, and catecholamine. Preexisting serotonin deficiency with increased progesterone sensitivity is also considered responsible for this disorder.
- An increase in prolactin levels or an increase in its sensitivity to the effect of prolactin, glucose metabolism alterations, abnormal hypothalamic–pituitary–adrenal (HPA) axis function, insulin resistance, and certain nutritional electrolyte deficiencies, and genetic factors have a role in PMS. Magnesium and calcium deficiencies are postulated as nutritional causes of PMS; studies evaluating supplementation show improvement in physical and emotional symptoms
- Stress amplifies the sympathetic activity, and this results in menstrual pain by significantly increasing the intensity of uterine contraction.
- The results of a large longitudinal study carried out by Bertone-Johnson et al suggested that the experience of abuse (emotional, sexual, or physical) in early life places women at higher risk for PMS in the middle-to-late reproductive years

PROGNOSIS:

PMS is generally a stable diagnosis, with susceptible individuals experiencing the same symptoms at the same intensity near the end of each cycle for years.Inability to maintain normal activities is part of the definition of this condition; hence, morbidity is related to loss of function. Complications of PMS may include school absence and behavioral problems. PMS and PMDD have been associated with a higher risk of bulimia nervosa. PMS may also be associated with an increased risk of future hypertension. Premenstrual breast pain is associated with fibrocystic breast changes. Treatment for specific symptoms is usually effective. Unsuccessful medical management of severe symptoms frequently indicates misdiagnosis. Even without treatment, symptoms tend to decrease in perimenopausal women, and induction of menopause through surgical removal of the ovaries is a treatment of last resort.However, those who experience PMS are more likely to have significant symptoms associated with menopause, such as hot flashes. [5]

MANAGEMENT:

Pharmacotherapy was always the first line of treatment for premenstrual syndrome, but recent research has suggested the superior benefits with combination therapy.Combination of pharmacotherapies with nonpharmacological treatments, mainly cognitive and behavioural therapies, exercises, massage therapy, light therapy along with dietary and nutritional modifications have been proven beneficial for the treatment of premenstrual symptoms. [6]

Many treatments have been tried in PMS. Typical recommendations for those with mild symptoms include:

- reducing salt and caffeine intake
- not drinking alcohol
- reducing stress, e.g., by scheduling fewer activities during the week before menstruation
- learning what to expect with PMS
- increasing exercise and
- improving sleep

Management of physical symptoms: Anti-inflammatory drugs such as naproxen may help with some physical symptoms, such as pain. Spironolactone is effective as a diuretic when water retention cannot be addressed through self-care alone.

Management of emotional symptoms: Antidepressants, particularly selective serotonin reuptake inhibitors and venlafaxine, are used as the first-line treatment of severe emotional symptoms of PMS.

Vitamins, minerals, and alternative medicine: Calcium, magnesium, vitamin E, vitamin B6, chasteberry, and black cohosh may help some.

HORMONAL THERAPY:

PMS results from ovulation and appears to be caused by the progesterone produced following ovulation in women who have enhanced progesterone sensitivity. This enhanced sensitivity may be due to neurotransmitter dysfunction. Treatment is aimed at suppressing ovulation or reducing progesterone sensitivity. [7, 8]

Progesterone and progestogens: The rationale for the use of progesterone and progestogens in the treatment of PMS is based on the hypothesis that deficiency of progesterone and its derivatives is the cause of PMS. Dydrogesterone, norethisterone and levonogestrel are progestogens used for PMS therapy on the basis of their progesterone-like action.

Oestrogen: Hormonal therapy in PMS is geared towards producing anovulation. There is some evidence that oestrogenic suppression of ovarian function eliminates PMS. Oestrogen is used in the form of implants, patches or gel.

Combined oral contraceptive pill: The combined oral contraceptive pill prevents ovulation and should be effective for the treatment of PMS. Recent studies of COCs comprising 0.02 mg of ethinyl oestradiol and 3 mg of drospirenone (compound hormone pills for 24 days followed by hormone-inactive pills for last 4 days) demonstrated improved PMS symptoms.

Gonadotropin-releasing hormone analoguess: The administration of GnRH analogues, either as depot injection or nasal spray, can produce anovulation resulting in medical oophorectomy. GnRH analogues cause pituitary desensitization to GnRH by downregulation of GnRH receptors.

Consequently, there is a reduction in the secretion of sex hormones (luteinizing hormone and follicle-stimulating hormone), and, eventually, anovulation is induced. There is some evidence to show that GnRH analogues are more efficacious for the physical symptoms of PMS than the behavioural symptoms. GnRH analogue therapy will help to identify women with severe PMS who would benefit from bilateral oophorectomy. A meta-analysis reported that GnRH agonists improve PMS symptoms with an odds ratio of 8.66. GnRH agonists had a better effect on physical than psychological symptoms, although the difference was not statistically significant. However, the use of GnRH agonists leads to a medically induced menopausal state, which is characterized by typical postmenopausal symptoms including amenorrhea, bone loss, vasomotor symptoms, and flushing. To decrease these side-effects, add-back therapy is typically employed. During this therapy, progestogen is necessary to protect the endometrium, but this hormone may cause PMS-like symptoms. Therefore, tibolon can be used instead to avoid symptom recurrence

Danazol: Danazol has androgenic and antigonadotrophic properties. It is used in gynaecology for the treatment of endometriosis, fibroids, menorrhagia and other menstrual disorders such as PMS. Danazol has been shown to be of benefit in the treatment of PMS and cyclic mastalgia when given in doses of 400 mg or 200 mg continuously. Danazol is thought to produce benefit by suppressing ovulation and eliminating hormonal cyclicity.

SURGERY:

Hysterectomy with bilateral oophorectomy or bilateral oophorectomy is a cure for PMS, but this is rather invasive and rarely justified. Surgery is reserved for severe cases of PMS in which other medical treatments have failed to provide any benefit. Although rarely performed, it has been shown that surgery in the form of total abdominal hysterectomy and bilateral salpingo-oophorectomy with appropriate HRT is an extremely effective and well-accepted permanent cure for PMS. [9]

PATIENT EDUCATION

Because PMS may cause major morbidity for the adolescent, providing patient education regarding alternative therapies that may alleviate some symptoms is important.Behavioral counseling and stress management may help the patients regain control during times of high emotionalism. Relaxation techniques may also help. Areas of stress should be identified. Relaxation techniques such as yoga, biofeedback, and self-hypnosis may be beneficial. Regular exercise often decreases the symptoms of PMS. Patients should be counselled to avoid salt, caffeine, alcohol, and simple carbohydrates.

CONCLUSION:

The exact pathophysiology of PMS is unknown but ovulation has to occur for symptoms to develop. Therefore, ovarian hormones are thought to be responsible for causing PMS. In summary, hormonal therapy is one of the treatment options for premenstrual syndrome and can be effective in reducing the severity of symptoms. Additionally, lifestyle modifications and alternative treatments should also be considered in managing PMS.

REFERENCES:

1. Frey Nascimento, A., Gaab, J., Kirsch, I., Kossowsky, J., Meyer, A., & Locher, C. (2020). Open-label placebo treatment of women with premenstrual syndrome: study protocol of a randomised controlled trial. *BMJ open*, *10*(2), e032868.
2. Gao, M., Zhang, H., Gao, Z., Cheng, X., Sun, Y., Qiao, M., & Gao, D. (2022). Global and regional prevalence and burden for premenstrual syndrome and premenstrual dysphoric disorder: A study protocol for systematic review and meta-analysis. *Medicine*, *101*(1), e28528.
3. Kwan, I., & Onwude, J. L. (2015). Premenstrual syndrome. BMJ clinical evidence, 2015, 0806.

4. Gudipally, P. R. (2023, July 17). Premenstrual syndrome. StatPearls - NCBI Bookshelf.
5. Roca, C. A., Schmidt, P. J., & Rubinow, D. R. (1999). A Follow-Up Study of Premenstrual Syndrome. The Journal of Clinical Psychiatry, 60(11), 763–766.
6. Ryu, A., & Kim, T. H. (2015). Premenstrual syndrome: A mini review. Maturitas, 82(4), 436–440.
7. Usman, S. B., Indusekhar, R., & O'Brien, S. (2008). Hormonal management of premenstrual syndrome. Best Practice & Research in Clinical Obstetrics & Gynaecology, 22(2), 251–260.
8. Morse, C., Dennerstein, L., Farrell, E., & Varnavides, K. (1991). A comparison of hormone therapy, coping skills training, and relaxation for the relief of premenstrual syndrome. Journal of Behavioral Medicine, 14(5), 469–489.
9. Cronje, W., Vashisht, A., & Studd, J. W. W. (2004). Hysterectomy and bilateral oophorectomy for severe premenstrual syndrome. Human Reproduction, 19(9), 2152–2155.

