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Review Article

CONCEPTUAL STUDY OF PREMENSTRUAL SYNDROME WITH MODERN AND AYURVEDA POINT OF VIEW

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ABSTRACT

Pre menstrual syndrome (PMS) is distressing psychological, physical and/ or behavioural symptoms. It occurs during the luteal phase of menstrual cycle. The significant regression of symptoms comes with onset of or during the period. PMS can also be defined as a combination of emotional, physical and psychological disturbances. It occurs after a woman's ovulation, which gets end with onset of her menstrual flow. Here, in this review a detailed explanation about its etiology, symptoms, signs, diagnosis, differential diagnosis and its treatment are being described. Ayurveda points of view regarding PMS are also being described. Premenstrual syndrome can be probably correlated with *Rituvyatita Kalaja Pitta Vata Vriddhi*. As *Vata dosha* plays important role in aggravating the other *Doshas* as well. *Vata Dosha* imbalance causes the imbalance state of other *Doshas* causing premenstrual syndrome. *Vata* in association with *Pitta* and *Kapha* simultaneously vitiates *Manodosha* and *Rasadhatu. Mithyahar vihar* is the *Samanya nidana* for this syndrome.

INTRODUCTION

The word pre-menstrual syndrome is composed of Pre means prior to; Menstrual means menses; syndrome means group of symptoms. It seems it is a collection of a group of symptoms prior to the menses. There is no universally agreed single definition for PMS. The WHO international classification of diseases (ICD) includes premenstrual tension syndrome under the heading "diseases of the genitourinary tract". It is also known as Premenstrual Tension (PMT) and Premenstrual Stress. Premenstrual syndrome is a psychoneuroendocrine disorder of unknown aetiology, often noticed just prior to menstruation. There is cyclic appearance of a large no of physical, psychological and behavioural symptoms during the last 7- 10 days of the menstrual cycle.

It should fulfil the following criteria (ACOG)

- Not related to any organic lesion (without any physically detectable cause)
- Regularly occurs during the luteal phase of each ovulatory menstrual cycle.
- Symptoms must be severe enough to disturb the life style of the woman or she required medical help.
- Symptom free period during rest of the cycle.

When these symptoms disrupt daily functioning, these are grouped under the name Pre Menstrual Dysphoric Disorder (PMDD). It is the severe form of PMS which should recurs for at least two menstrual cycles for making its diagnosis. In the mid 1980s, a multidisciplinary US national Institutes of Health consensus conference on PMS proper criteria that were adopted by the diagnostic and statistic Manual III (DSM III) to define the severe form of this condition: originally entitled "late luteal phase dysphoric disorder", it was later renamed "PMDD". It is included as a psychiatric disorder in the 5th edition of the Diagnostic & Statistical Manual for mental disorders (DSM-5). This is extremely common in all age groups but especially found in child bearing age group after the age of 30 yrs upto 45 yrs. The age incidence of PMS

is said to be due to the fact that stresses are most severe in the third and fourth decades. It has no relationship with parity, but symptoms disappear during pregnancy and after menopause. Educated, professional, highly strong patients are more likely to complain of PMS. The exact causes are unknown, although several different biologic factors have been suggested. Of these, estrogen and progesterone level variation (less common in women with surgical oophorectomy, drug induced ovarian hypofunction such as with GnRH agonists or rare in women with anovulatory cycles), as well as these sex steroids influence the CNS neurotransmitters, noradrenaline, gamma amino butyric acid (GABA) and serotonin, are frequently studied. Sex steroids also interact with the rennin-angiotensin-aldosterone system (RAAS) to alter electrolyte and fluid balance. The antimineral ocorticoid properties of progesterone and possible estrogen activation of the RAAS system may explain PMS symptoms of bloating and weight gain.

Most women of reproductive age have some physical discomfort or dysphoria in the weeks before menstruation. Symptoms are often mild, but can be severe enough to substantially affect daily activities. About 5–8% of women thus suffer from severe premenstrual syndrome (PMS); most of these women also meet criteria for premenstrual dysphoric disorder (PMDD). Mood and behavioural symptoms, including irritability, tension, depressed mood, tearfulness, and mood swings, are the most distressing, but somatic complaints, such as breast tenderness and bloating, can also be problematic. We outline theories for the underlying causes of severe PMS, and describe two main methods of treating it: one targeting the hypothalamus-pituitary-ovary axis, and the other targeting brain serotonergic synapses. Fluctuations in gonadal hormone levels trigger the symptoms, and thus interventions that abolish ovarian cyclicity, including long-acting analogues of gonadotropin-releasing hormone (GnRH) or oestradiol (administered as patches or implants), effectively reduce the symptoms, as can some oral contraceptives. The effectiveness of serotonin reuptake inhibitors, taken throughout the cycle or during luteal phases only, is also well established.[1]

AIM

Aim of this review is to evaluate and discuss about Pre menstrual syndrome, its prevalence, etiology, sign and symptoms and its management in both perspective Modern as well as Ayurveda.

OBJECTIVE

Is to elaborate the concept regarding pre menstrual syndrome in both perspective Ayurveda as well as Modern.

MATERIALS AND METHODS

From Brihatrayee and other Ayurveda literatures, articles related to pre menstrual syndrome are compiled. From Modern books and research papers and e-sources compilation is done.

Prevalence

It is estimated that as many as 3 of every 4 menstruating woman have experienced some form of PMS. The symptoms are mild, but 5-8% have moderate to severe symptoms that are associated with substantial distress or functional impairment. However, some studies suggest that upto 20% of all women of fertile age have premenstrual complaints.[2]

Previous Indian studies have found a 20% prevalence of PMS in the general population & among there with PMS 8% had severe symptoms[3]. Raval et al. did a study in Gujarat among 489 college students and found the prevalence of PMS was 18.4% and of PMDD was 3.7%.[4]

Etiology

The etiology of PMS remains unknown and may be complex and multifactorial. The role of ovarian hormones is unclear, but symptoms often improve when ovulation is suppressed. Changes in hormone levels may influence centrally acting neurotransmitters such as serotonin, 1 but circulating sex hormone levels are typically normal in women with PMS. Some evidence suggests that the disorder is related to enhanced sensitivity to progesterone in women with underlying serotonin deficiency. This mechanism may not explain all cases, because some patients do not respond to treatment with selective serotonin reuptake inhibitors (SSRIs). Deficiencies in prostaglandins, related to an inability to convert linoleic acid to prostaglandin precursors, may be involved in PMS. Genetic factors also seem to play a role, as the concordance rate is two times higher in monozygotic twins than in dizygotic twins.

Symptoms

A patient may complain of only one symptom or may be full of the following symptoms.

Table 1: Premenstrual Syndrome symptoms

S.No.	Related to	Symptoms
1.	Fluid retention	Bloating, Weight gain, Oedema, Reduced urination
2.	Pain	Pelvic pain, Mastalgia (breast tenderness), Headache, Joint & muscular pain, Backache.
3.	Psychological	Irritability, anger, depressed mood, crying and tearfulness, anxiety, tension, mood swings, lack of concentration, confusion, forgetfulness, restlessness, loneliness, decreased self-esteem, tension.
4.	Behavioural	Lack of consciousness Absenteeism Suicidal tendency & criminal acts Aggression Indecision
5.	Nervous system	Insomnia Hypersomnia Anaemia Food cravings Fatigue Pricking/tingling sensation Lethargy Agitation Change in sex drive Clumsiness Dizziness or vertigo
6.	Gastrointestinal	Nausea Diarrhoea Palpitations Sweating
7.	Skin	Acne, Oily skin, Greasy or dry hair

Signs

On physical examination– no abnormality is detected. The pelvic organs feel normal.

Table 2: Research Criteria for Premenstrual Dysphoric Disorder[5]

A. In most menstrual cycles during the past year, five (or more) of the following symptoms were present for most of the time during the last week of the luteal phase, began to remit within a few days after the onset of the follicular phase, and were absent in the week after menses, with at least one of the symptoms being 1, 2, 3, or 4:
1. Markedly depressed mood, feelings of hopelessness, or self-deprecating thoughts 2. Marked anxiety, tension, or feelings of being "keyed up" or "on edge" 3. Marked affective lability (e.g., feeling suddenly sad or tearful or increased sensitivity to rejection) 4. Persistent and marked anger or irritability, or increased interpersonal conflicts 5. Decreased interest in usual activities (e.g., work, school, friends, hobbies) 6. Subjective sense of difficulty in concentrating 7. Lethargy, easy fatigability, or marked lack of energy 8. Marked change in appetite, overeating, or specific food cravings 9. Hypersomnia or insomnia 10. A subjective sense of being overwhelmed or out of control 11. Other physical symptoms, such as breast tenderness or swelling, headaches, joint or muscle pain, a sensation of "bloating," or weight gain (NOTE: In menstruating females, the luteal phase corresponds with the period between ovulation and the onset of menses, and the follicular phase begins with menses. In non menstruating females (e.g., those who have had a hysterectomy), determining the timing of the luteal and follicular phases may require measurement of circulating reproductive hormones.)
B. The disturbance markedly interferes with work or school, or with usual social activities and relationships with others (e.g., avoidance of social activities, decreased productivity and efficiency at work or school).
C. The disturbance is not merely an exacerbation of the symptoms of another disorder, such as major

depressive disorder, panic disorder, dysthymic disorder, or a personality disorder (although it may be superimposed on any of these disorders).
D. Criteria A, B, and C must be confirmed by prospective daily ratings during at least two consecutive symptomatic cycles. (The diagnosis may be made provisionally before this confirmation.)

Diagnosis

PMS must be distinguished from simple premenstrual symptoms (e.g., bloating, breast tenderness) that do not interfere with daily functioning and are characteristic of normal ovulatory cycles.[6] The three key elements of the diagnosis are symptoms consistent with PMS, consistent occurrence of symptoms only during the luteal phase of the menstrual cycle, and negative impact of symptoms on function and lifestyle.[7] When PMS or PMDD is suspected, patients should be instructed to keep a premenstrual daily symptom diary for several consecutive months so that cycle-to-cycle variability can be examined. Based on this diary, many women may be found to have non luteal symptom patterns. Standardized daily symptom calendars, such as the Calendar of Premenstrual Experiences and the Prospective Record of the Impact and Severity of Menstruation, provide reliable and convenient record.

- Difficult to diagnose
- No clear cause
- Symptoms complex and vary
- Cyclic pattern – crucial for diagnosis
- Menstrual diary keeping – changes (physical, psychological)
- Symptoms appear prior to menses & disappear when bleeding starts.
- TFT (thyroid function test) – R/O other medical disorders
- USG to rule out organic cause- endometriosis etc.

Differential Diagnosis of Premenstrual Syndrome[8]

Affective disorder (e.g., depression, anxiety, dysthymia, panic)
Anemia
Anorexia or bulimia
Chronic medical conditions (e.g., diabetes mellitus)
Dysmenorrhea
Endometriosis
Hypothyroidism
Oral contraceptive pill use
Personality disorder
Substance abuse disorders
Perimenopause

Treatment

As the aetilogy of PMS is unknown so it is treated mostly empirically and symptomatically. Most commonly prescribed treatment is NSAIDS, pyridoxine, evening primerose oil, diuretics, OCP, Progestogens, GnRH analogues, psychotherapy, lastly surgery.

Management Treatment goals for PMS are to ameliorate or eliminate symptoms, reduce their impact on activities and interpersonal relationships, and minimize adverse effects of treatment. Although numerous treatment strategies are available, few have been adequately evaluated in randomized, controlled trials. Furthermore, research findings can be difficult to apply because of the variability of inclusion criteria and outcome measures in clinical trials, the lack of studies directly comparing treatment modalities, and the high response rate to placebo (25 to 50 percent). Initially, all patients with PMS should be offered non pharmacologic therapy. Medication should be offered to patients with persistent symptoms of PMS and those who meet criteria for PMDD. Surgical treatment, principally hysterectomy plus bilateral oophorectomy, is controversial because it is irreversible and associated with significant risks. Surgery may be considered in severely affected patients who fail to respond to other therapies and also have significant gynecologic problems for which surgery would be appropriate.

Nonpharmacologic Therapy: Non pharmacologic interventions for PMS include patient education, supportive therapy, and behavioral changes. Women who have been educated about the biologic basis and prevalence of PMS report an increased sense of control and relief of symptoms. Although not rigorously evaluated, supportive therapy may be responsible for the high placebo-response rates in clinical trials. Small comparative trials show some benefit for formal psychologic interventions such as relaxation therapy and cognitive behavioral therapy. Behavioral measures include keeping a symptom diary, getting adequate rest and exercise, and making dietary changes. The daily symptom diary may help patients identify optimal times for implementing behavioral and other changes to manage symptom exacerbations. Women report that maintaining a symptom diary helps them manage PMS or PMDD. Sleep disturbances, ranging

from insomnia to excessive sleep, are common in women with PMS. A structured sleep schedule with consistent sleep and wake times is recommended, especially during the luteal phase. Dietary restrictions and exercise may also be useful in patients with PMS. Sodium restriction has been proposed to minimize bloating, fluid retention, and breast swelling and tenderness. Caffeine restriction is recommended because of the association between caffeine and premenstrual irritability and insomnia. In epidemiologic and short-term prospective studies, women with PMS who practiced aerobic exercise reported fewer symptoms than control subjects.

In one randomized, placebo-controlled crossover trial[9] chiropractic therapy was associated with a decrease in PMS symptoms. However, this effect was only noted in patients randomized to initially receive chiropractic treatment.

Dietary Supplementation: Dietary supplements that have been evaluated in women with PMS include vitamins (A, E, and B6), calcium, magnesium, multivitamin/mineral supplements, and evening primrose oil. Because most studies have been small or poorly designed, efficacy needs to be confirmed in large, well-designed clinical trials before evidence-based recommendations can be made. In nine randomized, controlled clinical trials of vitamin B6 as a single supplement or in a multivitamin, improvement of symptoms was reported, but the poor quality of the trials limits their usefulness.[10] Vitamin B6 should not be routinely recommended for women with PMS.[11] Studies of vitamin A do not support its use, but vitamin E supplementation is a recognized treatment for mastalgia[12]. In one randomized, controlled trial, the administration of 400 IU per day of vitamin E during the luteal phase was found to improve affective and somatic symptoms in women with PMS. [13] The ACOG recognizes vitamin E as a potential treatment for PMS, because of minimal harm and its potentially beneficial antioxidant effect. Supplements of calcium carbonate in a dosage of 1,200 mg per day for three menstrual cycles resulted in symptom improvement in 48 percent of women with PMS, compared with 30 percent of placebo-treated women. [14] Magnesium in a dosage of 200 to 400 mg per day has shown minimal benefit in alleviating bloating.[15] The ACOG recommends calcium supplementation but not magnesium supplementation. Evening primrose oil, a prostaglandin precursor, has been studied in women with PMS, based on the theory of inadequate levels of prostaglandin E1. A systematic review of placebo-controlled trials of evening primrose oil suggested lack of benefit in PMS, although mild relief was demonstrated in women with breast tenderness. [16]

Hormones[17]

Hormone therapy should only be prescribed when other measures fail. Oestrogen, progestogen and androgen have all been advised and used, the rationale depending on different theories of the causation of symptoms. However, it is probably more effective to eliminate endogeneous hormone variations by the administration of daily oral contraceptive pills, or progestogens, e.g. deyhydro-gesterone 20mg daily, oral medroxyprogesterone acetate 10-30mg daily, oral medroxyprogesterone acetate 10-3mg daily or depot medroxy-progesterone acetate 150mg i.m. every 3 months.

GnRH agonists have had success in 60-70 percent of patients with PMS. This medical oophorectomy has significant side effects. Combining it with oestrogen– progestogen add-back decreases the side effects but also the efficacy of treatment of PMS.

Other Drugs

Bromocriptine has been tried but it best relieves cyclical breast symptoms. While some of other symptoms are made relieved or made tolerable, the overall benefit is not significantly greater than the obtained by the combination of placebo therapy and a caring physician.

When there is emotional instability and anxiety, mild tranquilizers are beneficial. Most proprietary remedies contain mixtures of vitamins and micronutrients while others contain tranquilizers, anti- histamine stimulants, and progestogens as well.

Surgery

In some extreme cases, relief may not be obtained with any medications. Total abdominal hysterectomy with bilateral salpingo-oophorectomy has been recommended for these women, followed by HRT with unopposed oestrogen. However, since this is an extreme step, a test with a GnRH analogue should be done to confirm that the procedure will indeed be effective. Adequate counselling is essential.

Prescription Medications Commonly Used in the Treatment of Premenstrual Syndrome (PMS) [18]

Drug class and representative agents	Dosage	Recommendations for use	Side effects
SSRIs Fluxetine (sarafem)	10 to 20mg	First-choice agents for treatment of PMDD, at present, only fluxetine is labelled for this indication.	Insomnia, drowsiness, fatigue, nausea, nervousness, headache, mild tremor, sexual dysfunction.
Sertraline (Zoloft)	50 to 150mg	Clearly effective in alleviating behavioural and physical symptoms of PMS and PMDD.	
Fluvoxamine (luvox)	25 to 50mg/day	For intermittent therapy, administer during luteal phase (14 days before menses).	
Diuretics: Spironolactone	25to 100mg/day during luteal phase	Clearly, effective in alleviating breast tenderness and bloating.	Antiestrogenic effects, hyperkalemia
NSAIDs Naproxen, sodium (Anaprox.)	275 to 550mg twice daily	Effective in alleviating various physical symptoms of PMS but not breast tenderness.	Nausea, gastric ulceration, renal dysfunction, use with caution in women with pre- existing gastro intestinal or renal disease.
Androgens Danazol (Danocrine)	100 to 400mg twice daily	Somewhat effective in alleviating mastalgia when taken during luteal phase continuous therapy is not recommended because of side effects profile and cost.	Weight gain, decrease breast size, deepening of voice, monitor lipid profile and liver function.
GnRH agonists Leuprolide (lupron)	3.75mg IM every month or 11.25mg IM every three months.	Somewhat effective in alleviating physical and behavioral symptoms of PMS.	Hypoestrogenic side effect including atrophic vaginitis, hot flushes, cardio- vascular and osteoporosis.
Goserelin (zoladex)	3.6mg SC every month or 10.8mg SC every three months.		
Nafarelin (synarel)	200 to 400mg intra- nasally twice daily.		
Histrelin (supprelin)	10mg per kg per day SC		

According to Ayurveda Point of View

In the *Ritu chakra* (menstrual cycle), three phases are described in the classic texts of Ayurveda as well as in modern books. The phases are *Rajah Kala* (Menstrual phase), *Ritu Kala* (Proliferative phase with ovulation) and finally the *Rituvyatita Kala* (Luteal or secretary phase).[19]

Ritu Chakra **(menstrual cycle)**	***Rajah Kala*** **(Menstrual phase),**	***Ritu Kala*** **(Proliferative phase with ovulation)**	***Rituvyatita Kala*** **(Luteal or secretary phase)**
Dosha Pradhanta (predominance)	*Vata*	*Kapha*	*Pitta*
Dosha Chaya	*Kapha*	*Pitta*	*Vata*
Dosha Prakopa	*Vata*	*Kapha*	*Pitta*
Dosha Shamana	*Pitta*	*Vata*	*Kapha*

Rituvyatita Kala (phase) is governed by *Pitta* basically. *Pitta* is a kind of transformation energy. So the basal body temperature is raised by 0.5^0F to 1^0F as said in the modern books. This is due to *Pitta Dosha* predominance by Ayurvedic principals and due to thermogenic effect of norepinephrine and progesterone by modern science. *Pitta* is formed of Agni *Mahabhuta* mainly. So the *Agni* of whole body rises along with the *Updhatvagni* of endometrium layer of uterus specifically.

Premenstrual syndrome can be probably correlated with *Rituvyatita Kalaja Pitta Vata Vriddhi*. As stated in *Sharangdhara Samhita*,[20] *Pitta* and *Kapha Doshas* are *Pangu* and the movement of these *Doshas* is done by *Vata Dosha* only. So *Vata Dosha* imbalance causes the imbalance state of other *Doshas* causing premenstrual syndrome. *Vata* in association with *Pitta* and *Kapha* simultaneously vitiates *Manodosha* and *Rasadhatu. Mithyahar vihar* is the *Samanya nidana* for this syndrome. *Mithya-ahara*, not following codes and conduct of food, *Mithya-vihara* like *Ati-chintana, Shoka*, *Bhaya* leads to *Vata prakopa*. Further exposure to *Nidana* makes *Vata* move in *Viloma gati* presented as *Anavasthita chitta*, *Udvega, Glani, Rodana, Pralapa, Daha, Shotha, Sarvanga vedana* etc.

It is useful to eat *Yava* during menstruation. Similarly, Milk is sweet, unctuous, refreshing, body-promoting, intellect- promoting, strength-promoting, mind- promoting, vitalizes, fatigue-alleviating, destroyer of internal haemorrhage, union-promoting in injuries, whole-some for all living beings. Hence, it is always better to avoid the factors which trigger the complications during the menstruation. But, now-a-days, at the era of globalization it is quit impossible to follow the *Rajaswala Paricharya*[21] as it is mentioned in the Classics. But, it can be followed at some extent such as these modifications in the *Rajaswala Paricharya* will help to maintain her equilibrium of health during the most sensitive period of menstruation.

Some Drugs that can be used in Ayurveda are *Yastimadhu churna, Gokshura churna, Dadimastaka churna, Brahmi, Ashwagandha, Jatamamsi* and *Guduchi* to cope with emotional symptoms, *Shatavari* and *Kumari* are the best to deal with a *Pitta* imbalance.

Some *Yoga* can also be prescribed along with medicines like *Ushtrasana, Gomukhasana, Bhujangasana* and *Pavanamuktasana. Pranayamas* like *Nadi Shodhana* and *Anulomaviloma* are also helpful in *Vata* imbalance, *Naukasana* and *Dhanurasana yoga* postures and *Sheetali pranayama* can be use in *Pitta* imbalance. *Suryanamaskaras* and spinal twists *Bastrika* and *Kapalbhati* in *Kapha* imbalance.

CONCLUSION

Hence, severe PMS is consistently reported by about 5% of all women of fertile age. The management of PMS is complex. At the outset it is important to establish a precise diagnosis and not rely on the patient's own diagnosis. It is mandatory to separate PMS/PMDD from other diagnoses, particularly depression and anxiety disorders, premenstrual exacerbation of another disorder, or mild physiological symptoms requiring no more than reassurance; preferably this assessment should be done by the general practitioner before referral to a gynaecologist or a psychiatrist. Diagnosis is best achieved through daily rating symptoms over at least one menstrual cycle; clinicians can ask patients to choose their worst symptoms and chart the severity daily, or can select a validated scale such as the Daily Record of Severity of Problems.

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