

Premenstrual Syndrome: Correlation and Functional Impairment

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ABSTRACT

Introduction: Premenstrual syndrome (PMS) and its more severe form “premenstrual dysphoric disorder (PMDD)” is a common yet underdiagnosed disorder. It is characterized by anxiety, mood changes, and several somatic symptoms in the last week of the luteal phase and began to remit within a few days after the onset of the follicular phase.

Aims: The aim of this study was to evaluate the prevalence of PMS and PMDD among females at a tertiary care center and evaluate the associated symptomatology, sociodemographic variables, and functional impairment.

Materials and methods: In an observational, cross-sectional study, 150 randomly selected females (18–30 years) were evaluated for menstrual history after sociodemographic profiling. Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV)-TR (SCID)-PMDD was applied among those who were positive on premenstrual symptoms screening tool. Statistical analysis was done using Statistical Package for the Social Sciences, version 14.0.

Results: The prevalence of PMS was 21.33%. Moderate to severe PMS was 14% and PMDD was 7.33% according to DSM-IV-TR criteria. Fatigue/lack of energy, decreased interest in work were the most commonly reported symptoms. Decreased school/work efficiency and productivity was the commonest form of functional impairment. Increased body mass index, onset of symptoms since menarche, duration of premenstrual symptoms, menstrual cramps, and family history showed statistically significant association with PMS/PMDD.

Conclusion: Premenstrual syndrome is fairly common and causes significant functional impairment. Screening females in relevant age group for its symptomatology may aid in early detection and better management.

Keywords: Premenstrual dysphoric disorder, Premenstrual symptom, Premenstrual syndrome.

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INTRODUCTION

Nearly one-fourth (27.7%) of the Indian female population falls in the 15 to 29 years age group.¹ This reproductively important transition phase of life associated with growth spurts in several physical and mental dimensions. It is estimated in epidemiological surveys that as many as 80% of reproductive age women experience some symptoms in the premenstrual phase.²

Premenstrual dysphoric disorder (PMDD) is a severe form of premenstrual syndrome (PMS) which significantly impairs quality of life.³ The disability-adjusted life years lost to this is comparable with other major psychiatric disorders, such as depression and anxiety.⁴ Recently, PMDD has been incorporated in the main body of Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V), from Appendix B as in DSM-IV.⁵

The psychological symptoms associated with PMDD are depressed mood, anxiety, affective lability, anger or irritability, decreased interest in usual activities, difficulty in concentrating, easy fatigability, change in appetite, overeating, hypersomnia or insomnia, feeling overwhelmed, and other physical symptoms, such as breast tenderness, pain, bloating, and weight gain. These symptoms are present for most of the time during the last week of the luteal phase, begin to remit within a few days of the onset of menstrual flow, and are absent in the week after menses.⁶ Women with PMS report significant impairment in personal relationships, compromised work levels, and increased absence from work, school, or college.⁷

Serotonin neurotransmitter abnormalities is the commonly implicated etiology,⁸ as suggested by preclinical studies and proven therapeutic efficacy of serotonergic drugs, in managing PMDD.^{9,10} Lifestyle factors like caffeine, salt, chocolate, refined sugars, sedentary habits aggravate symptoms of PMS/PMDD. But lifestyle modifications lack definitive therapeutic evidence.³ Premenstrual syndrome is relatively underinvestigated in Indian context owing to various sociocultural factors. We aimed to study PMS/PMDD its associated symptomatology, sociodemographic, menstrual factors, and functional impairment.

MATERIALS AND METHODS

In an observational cross-sectional study, randomly selected 150 females (18–30 years) presenting to Department of Psychiatry, Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India, were evaluated.

All females 18 to 30 years old, with regular menstrual cycles (21–35 days) and willing to give written informed consent were included in the study. Subjects with medical and gynecological illnesses, such as anemia, diabetes, hypothyroidism, asthma, migraine, epilepsy, pelvic inflammatory disease, endometriosis, and amenorrhea were excluded. Also subjects with history of substance abuse or psychotropic drugs were excluded from the study. After sociodemographic data, detailed menstrual history, premenstrual symptoms, hormonal pills use, family history in first-degree relatives were collected. Premenstrual symptoms screening tool (PSST) was applied.² The questions and meaning of related terms were explained to the participants up to their satisfaction. Confidentiality was assured to all the participants ensuring cooperation and participation.

Premenstrual Symptoms Screening Tool

Steiner et al² developed this screening tool for premenstrual symptoms. This “translates” categorical DSM-IV-TR criteria¹² into a rating scale with degrees of severity. It consists of 14 items assessing premenstrual symptoms of mood, anxiety, sleep, appetite, and physical symptoms. It also includes functional impairment items of five different domains.

Participants rate their experience of each symptom and functional impairment in last 12 months duration during most of the cycles on 4-point Likert scale as “not at all,” “mild,” “moderate,” or “severe.” Using PSST scoring criteria, PMDD, moderate to severe PMS, and no/mild PMS subjects were identified.¹

Structured Clinical Interview for DSM-IV-TR (SCID-DSM-IV)

The SCID-PMDD is a clinician-administered structured interview developed and validated by Accortt et al.¹¹ It includes 11 psychological and physical symptoms of criterion A¹² phrased in a detailed layperson format similar to items on the SCID¹³ to facilitate the assessment of the specific DSM-IV-TR criteria for PMDD.

Statistical Analysis

Descriptive and analytical statistical analysis was done using Statistical Package for the Social Sciences version 4.0

RESULTS

Out of total studied 150 subjects, 18 participants (7.33%) on screening by PSST met DSM-IV-TR criteria for the diagnosis of PMDD. Twenty-one participants (14.7%) marginally missed the DSM-IV-TR criteria for the diagnosis of PMDD (moderate to severe PMS).

Remaining 118 subjects (78.67%) had “no/mild PMS.”

On analyzing the sociodemographic characteristics of studied subjects, there was no statistically significant difference among three groups with respect to residence, religion, and marital status. Postgraduate students had higher rates of PMS and PMDD compared with illiterates and graduates (Table 1).

The most common reported symptom was “fatigue/lack of energy” in the study group (102, 68%), followed by “decrease interest at work” (94, 62.67%) and “anger/irritability” (90, 60%). Almost all participants (95.24%) of “moderate to severe PMS” group and majority of PMDD group (90.91%) reported “fatigue/lack of energy”. Decrease interest in work was reported by all participants of PMDD group, also majority of “moderate to severe PMS” group (95.24%), and near two-thirds of all (60.1%)

Table 1: Sociodemographic characteristics of subjects

Characteristic	No/mild PMS n = 118 (%)	Moderate to severe PMS n = 21 (%)	PMDD n = 11 (%)	Total (%)	p-value
Mean age	23.1 ± 1.2	22.9 ± 1.1	21.6 ± 1.9	–	0.04
Rural/urban					
Rural	52 (78.8)	10 (15.15)	4 (6.06)	66	0.8
Urban	67 (79.8)	12 (14.3)	5 (5.95)	84	
Religion					
Hindu	118 (78.7)	23 (15.33)	9 (6.0)	138	0.6
Muslim	9 (75)	2 (16.67)	1 (8.3)	12	
Marital status					
Single	104 (80.62)	22 (17.05)	3 (2.33)	129	0.8
Married	16 (76.2)	4 (19.05)	1 (4.76)	21	
Education					
Illiterate	74 (77.08)	14 (14.58)	8 (8.3)	96	0.009
Graduate	16 (8.88)	2 (11.11)	–	18	
Postgraduate	23 (63.89)	8 (22.22)	5 (13.89)	36	

Chi-square test; p < 0.05 is considered statistically significant

Table 2: Symptoms associated with PMS/PMDD

Symptom(s)	No/mild PMS n = 118 (%)	Moderate to severe PMS n = 21 (%)	PMDD n = 11 (%)
Affective lability	33 (27.97)	17 (80.95)	10 (90.91)
Depressed mood	52 (44.07)	20 (95.24)	11 (100)
Decreased interest in social activities	49 (41.53)	19 (90.48)	8 (72.73)
Decreased interest in usual activity at work	63 (53.39)	20 (95.24)	11 (100)
Decreased interest in usual activity at home	52 (44.07)	18 (85.71)	9 (81.82)
Anger/irritability	63 (53.39)	17 (80.95)	10 (90.91)
Anxiety/tension	56 (41.46)	18 (85.71)	11 (100)
Fatigue/lack of energy	72 (61.02)	20 (95.24)	10 (90.91)
Overeating/food craving	10 (8.47)	9 (42.86)	4 (36.36)
Insomnia	22 (18.64)	16 (76.19)	7 (63.64)
Feeling overwhelmed	20 (16.95)	15 (71.43)	7 (63.64)
Hypersomnia	29 (24.58)	14 (66.67)	8 (72.73)
Physical symptoms	43 (36.44)	16 (76.19)	8 (72.73)

Table 3: Functional impairment associated with PMS/PMDD

Functional impairment	No/mild PMS n = 88 (%)	Moderate to severe PMS n = 21 (%)	PMDD n = 11 (%)	p-value
Relationships with friends, classmates/coworkers	35 (39.77)	16 (76.19)	10 (90.91)	<0.004
Relationship with your family	23 (26.14)	14 (66.67)	9 (81.82)	<0.003
School/work efficiency or productivity	61 (69.32)	19 (90.48)	10 (90.91)	0.0016
Social life activities	36 (40.91)	17 (80.95)	10 (90.91)	<0.001
Home responsibilities	35 (39.77)	18 (85.71)	9 (81.82)	<0.005

Chi-square test; $p < 0.05$ is considered statistically significant

participants, and thus, it remained the second most common reported symptom (Table 2).

A total of 120 participants reported at least one area of impaired functioning. Most frequent functional impairment reported was "school/work efficiency and productivity" seen among 92.5% of the total respondents, 90.48% of "moderate to severe PMS," and 10 of 11 among "PMDD" group (Table 3).

The mean menstrual cycle length was 23.1 ± 1.2 days in no/mild PMS group and 22.9 ± 1.1 and 21.6 ± 1.9 in moderate to severe PMDD groups respectively. There was no statistically significant difference among groups with respect to age of menarche, length of the menstrual cycle, and days of the menstrual bleeding. Premenstrual dysphoric disorder group and "moderate to severe PMS" group experienced more number of days and years with premenstrual symptoms as compared with "no/mild PMS" group.

All study groups were comparable with respect to regularity of cycles at the time of menarche ($p = 0.76$), although there was statistically significant difference among groups with respect to positive family history, in first-degree relatives, menstrual cramps, and symptoms onset since menarche.

More number of participants in "moderate to severe PMS" and "PMDD" groups reported that they had symptoms since menarche as compared with "no/mild PMS" group ($p < 0.003$). There was no statistically significant

difference among groups with respect to regular exercise ($p = 0.24$) or regular games ($p = 0.82$).

DISCUSSION

Several previous studies were comparable to our study owing to similar sample characteristics like similar age group and preponderance of urban unmarried.¹⁴⁻¹⁹

The prevalence of PMS according to DSM-IV-TR criteria was 21.33% (14% for moderate to severe PMS and 7.33% for PMDD) among studied 150 subjects. Rapkin and Mikacich²⁰ and several other Asian studies show similar results.^{12,13,15,18} In an Indian study, Banerjee et al²¹ reported 6.4% prevalence of PMDD in Indian women.²² Our results were also concordant with Steiner et al¹⁴ who reported the prevalence of severe PMS and PMDD as 21.3 and 8.3% respectively, although few studies like Chayachinda et al²³ report a higher prevalence of PMDD (25.1%) of PMDD among Thai nurses. The slightly lower prevalence in our study can be attributed to sociocultural factors, stress, and beliefs in Indian society that affect reporting of the premenstrual symptoms.

Fatigue/lack of energy (68%) was the most common reported symptom in our study sample.

Similar results were suggested by Nourjah¹⁸ and Bakhshani et al,¹⁵ whereas Pearlstein et al,²⁴ Tabassum et al,¹⁶ and Nisar et al²⁵ reported it as the third most common symptom.

Second and third most common symptoms reported by our study subjects were decreased interest in work

Table 4: Correlation of PMS/PMDD

Characteristic	No/mild PMS n = 118 (%)	Moderate to severe PMS n = 21 (%)	PMDD n = 11 (%)	p-value
Age at menarche (years)	14.8 ± 1.6	14.5 ± 1.2	13.9 ± 0.2	0.06
BMI	18.1 ± 3.7	19.8 ± 3.8	19.2 ± 3.5	0.005
Length of cycle (days)	29.3 ± 2.4	28.5 ± 2.3	28.4 ± 1.8	0.4
Days bleeding lasts	4.8 ± 1.8	4.9 ± 1.3	4.9 ± 1.1	0.6
Premenstrual symptom duration (days)	1.6 ± 1.2	2.8 ± 1.6	3.9 ± 1.1	<0.001
Years with premenstrual symptom	2.5 ± 2.1	3.8 ± 1.7	3.8 ± 1.1	0.005

Chi-square test; p < 0.05 is considered statistically significant

Table 5: Demographic correlations

Characteristic	No/mild PMS n = 118 (%)	Moderate to severe PMS n = 21 (%)	PMDD n = 11 (%)	p-value
Regularity of cycle at menarche	88 (74.58)	16 (76.19)	8 (72.73)	0.76
Onset of symptoms since menarche	26 (22.03)	14 (66.67)	5 (45.45)	<0.003
Menstrual cramps	67 (56.78)	18 (85.71)	9 (81.82)	0.008
Family history of PMS	24 (20.34)	10 (47.62)	4 (36.36)	0.006
Regular exercise	30 (25.42)	4 (19.05)	1 (9.09)	0.24
Regular games	33 (27.97)	7 (33.33)	3 (27.27)	0.82

Chi-square test; p < 0.05 is considered statistically significant

(62.67%) and anger/irritability (60%) respectively. Several studies in past have reported anger/irritability as the most common symptom.^{2,14,16,24-26} Stout et al²⁷ in a community-based nonpatient sample reported "decreased energy" and "being irritable" as the most common reported premenstrual symptoms. Singh et al¹⁹ while studying Indian college students reported that the most common symptom in subjects "not having any impairment" was "irritability" and those "with impairment" was "tiredness and lack of energy." In DSM-V the order of symptoms have been revised for diagnostic criteria of PMDD.²⁸ "Mood swings and irritability" are now at the top of the list as compared with "markedly depressed mood" in the DSM-IV-TR. Our findings are consistent with this change in DSM-V.²⁸

Steiner et al¹⁴ suggested nearly three-quarters PMDD and almost half of the severe PMS cases reported that symptoms interfered with their relationships and/or school/work efficiency/productivity. Similarly, in our study, "school/work efficiency and productivity" was the most common (60%) reported functional impairment (Table 4).

Our study suggests association of higher body mass index (BMI) with "moderate to severe PMS" and "PMDD" groups than "no/mild PMS" group (p = 0.005). Another Indian study by Bansal et al²⁶ and literature supports our findings.²²

Similar to Steiner et al² and Issa et al,¹⁷ our study found no significant difference in length of the menstrual cycle (p = 0.4) and days of the menstrual bleeding (p = 0.6) in all the groups.

Our study suggests statistically significant higher duration of premenstrual symptoms in "PMDD" group

and "moderate to severe PMS" group. This is probably because of the chronic, relapsing, and remitting nature of illness. Study by Steiner et al² supports our results. Positive family history and menstrual cramps were more common in "moderate to severe" PMDD study groups, as also suggested in several other studies.^{2,14,17,18,22,23,25,29,30} Also, Deuster et al,³¹ Nourjah,¹⁸ and Nisar et al²⁵ found a family history of PMS in more than half of the study participants (57%). A genetic preponderance is suggested in several studies (Table 5).³²⁻³⁴

The "onset of symptoms since menarche" was significantly more in "moderate to severe PMS" and PMDD groups, which is supported by existing literature.¹⁴ Physical exercise in the form of regular exercise and games failed to show any association with study groups. Benefits of aerobic exercise have been suggested for PMS sufferers, and high-intensity aerobic exercise was found to be superior to low-intensity one for PMS treatment.²²

The study has certain limitations. The study sample represented only a group at a single tertiary care center. Recall bias cannot be ruled out as subjects reporting premenstrual symptoms was based on retrospective recall of symptoms. Larger prospective population-based studies are recommended using gold standard prospective daily diaries of symptoms for future trials.

CONCLUSION

Premenstrual syndrome is a common underrecognized entity presenting at a tertiary care center. The most common presenting symptoms include fatigue and decreased interest in work. It significantly causes functional impairment commonly in the form of decreased

work efficiency and productivity. Higher BMI, early onset of symptoms since menarche, longer duration of premenstrual symptoms, menstrual cramps, and family history are significant correlates. Early diagnosis may pave the way for effective management and significant improvement in quality of life.

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