

A study of co-morbid depression and anxiety in pre-menstrual dysphoric disorder (PMDD) among undergraduate medical students: a descriptive study

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Abstract

Background: PMDD is a cyclical disorder associated with luteal phase of menstrual cycle which presents with multiple somatic and affective complaints and functional impairment. It is frequently associated with significant co-morbidities like depression, anxiety, panic disorder and dysthymia. The presence of PMDD and associated co-morbidities result in significant impairment in physical, social and occupational functioning.

Aim: To study co-morbid depression and anxiety and their severity in PMDD

Methods: The study was conducted among undergraduate (UG) medical students of S. Nijalingappa Medical College, Bagalkot. Students were assessed on their premenstrual symptom severity using the Daily Record of Severity of Problems (DRSP), Hamilton depression rating Scale (HAM-D) for depression and Hamilton anxiety Rating Scale (HAM-A) for anxiety. The study population was divided into two groups: with and without PMDD and depression and anxiety was compared in both the groups. Statistical analysis was done using SPSS11 version.

Results: PMDD was reported in 20.9% female medical students. Co-morbid depression and anxiety were both higher in group with PMDD as compared to those without PMDD.

Conclusion: PMDD is both common and disabling disorder associated with significant co-morbidities. Early diagnosis and intervention can prevent significant burden of health care costs in our set up.

Keywords: PMDD; Depression; Anxiety; Medical students

Introduction

PMDD is a somatopsychic illness triggered by changing levels of sex steroids that accompany an ovulatory menstrual cycle. It occurs about a week before the menstrual cycle and is characterized by irritability, emotional lability, headache, anxiety and depression with somatic symptoms of oedema, weight gain, breast pain, syncope and paresthesias.¹ Almost 40% of women have mild to moderate premenstrual symptom. 3-7% of these women suffer from full diagnostic criteria of PMDD. Since most women suffer from one or other mood/somatic symptom during this phase, it is important to recognize those in whom the condition is associated with functional impairment.²

Major depressive disorder, dysthymia, generalized anxiety disorder (GAD) and bipolar disorder are

most commonly associated with PMDD.³⁻⁶ 30-76% of women with PMDD have history of depression. Both depression and PMDD have bilateral negative impact on each other. Medical students are among the high stress people. Thus, it is predictable that depression and Premenstrual Syndrome (PMS) have elevated frequencies in this population.⁷

According to Delara *et al.* in a study among adolescents between 14-19 years, 37.2% (224 out of 607) met the diagnostic criteria for PMDD.⁸

In a recent study in Gujarat, India the prevalence of PMS reported was 18.4% and PMDD 3.7% according to Diagnostic & Statistical Manual for Diseases – IV Text Revision (DSM-IV TR) and 91% according to the International Classification of Diseases, 10th edition criteria (ICD-10) among the college students.⁹

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Another study from western India reported 12.22 % of females to be suffering from PMDD with all showing work impairment during the period. Also co- morbid depression was reported in 18.52% of those who suffered from PMDD.¹⁰

Considering the above findings, it is predictable that medical students are at high risk for PMDD and a prompt and early awareness about this common and yet neglected diagnosis can help prevent these individuals from disabling consequences of the disorder.

The objectives of the present study were -

- To find co-morbid depression & anxiety in students with PMDD
- To compare the severity of depression and anxiety in those with / without PMDD

Materials and Methods

The study was descriptive in design. Permission for the study was taken from the ethics committee of SNMC & HSK Hospital, Bagalkot for the same. Undergraduate medical students satisfying the inclusion and exclusion criteria were included in analysis. The study period was between June-August 2016.

Inclusion criteria

1. Students giving informed consent
2. Age 18 - 24 years
3. Having regular menstrual cycles

Exclusion criteria

1. Irregular menstrual cycles
2. Students on contraceptives/ hormonal preparations
3. Major medical / gynaecological illness
4. Students on psychotropics

1. Daily record for severity of problems (DRSP), a questionnaire used to assess pre- menstrual symptoms and their severity starting on the day of their cycle. The questionnaire is based upon all symptom criteria required for diagnosis of PMDD as per DSM- IV TR. It is a prospective charting where each student should tick the form each night before going to bed for the whole month. This is evaluated for a period of 2 months following which a diagnosis of PMDD can be made. A luteal phase score $\geq 30\%$ above the follicular phase gives a diagnosis of PMDD.¹¹ This tool will help to diagnose and separate the two groups those having PMDD and those not.

2. Hamilton depression rating scale (HAM- D): It is a 17 item scale used to measure the severity of depression. Scores ≤ 7 : normal, scores between 8-13: mild depression, scores between 14-18 : moderate depression and scores 19 and above as severe depression.¹²

3. Hamilton anxiety rating scale (HAM- A): It is a 18 item scale with scores between 0-56 used to measure severity of anxiety. Mild anxiety < 17 , Moderate anxiety: 18-24, Severe anxiety: > 25 .¹³

Out of 340 students who were given the proforma, 301 forms were complete in all respect and fulfilling the inclusion and exclusion criteria and thus included in the final analysis. The students were divided in two groups on whether suffer from PMDD or not. Assessment of co-morbidity and comparison of severity of depression and anxiety was done between both the groups.

Data analysis was done using the SPSS 11 software. Chi square test was used for the categorical variables. Unpaired 't' test was used for analysis of quantitative data.

Results

The entire age group of the study population varied from 18- 25 years. The mean age of the study sample was 20.75 years with standard deviation (SD) of 1.92. Figure 1a shows the distribution of students in three age groups between 18- 20 years, 21- 23 years and > 23 years. 47.5% of students belonged to age group between 18- 20 years, 45.8% were between 21-23 years of age and 6.6% students were > 23 years of age.

15.3% of students were 18 years of age, 19 years (16.3%), 20 years (15.9%), 21 years (14.6%), 22 years (15.0%), 23 years (16.3%), 24 (4.7%) and 25 years (2.0%). Figure 1b shows the frequency and percentage distribution of students according to their age in years.

21.9% belonged to 1st year, 22.9% in 2nd year, 34.2% students in 3rd year and 20.9% in 4th year respectively. Figure 2 shows year-wise percentage of MBBS students in the study sample.

PMDD was reported in 20.9% of medical students. Depression as measured by the HAM- D scale was absent in 69.4% of students while mild, moderate and severe depression was reported in 22.3%, 6.6% and 1.7% of the students. Mild anxiety as observed by HAM- A scale was reported in 89% of students, 9.3% had moderate and 1.7 % had severe anxiety as shown in table 1.

Table 1: Distribution of PMDD, depression and anxiety among medical students

Parameter	Frequency	Percentage
PMDD		
Absent	238	79.1
Present	63	20.9
Total	301	100
DEPRESSION		
Absent	209	69.4
Mild	67	22.3
Moderate	20	6.6
Severe	5	1.7
Total	301	100
ANXIETY		
Mild	268	89.0
Moderate	28	9.3
Severe	5	1.7
Total	301	100

Figure 1a

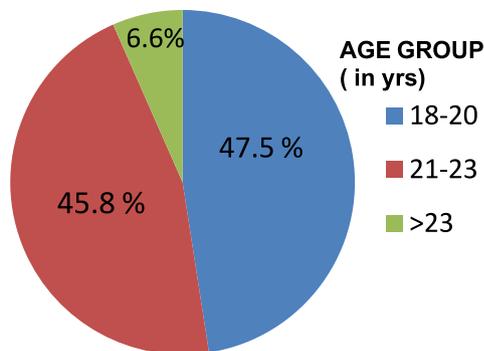


Figure 1b

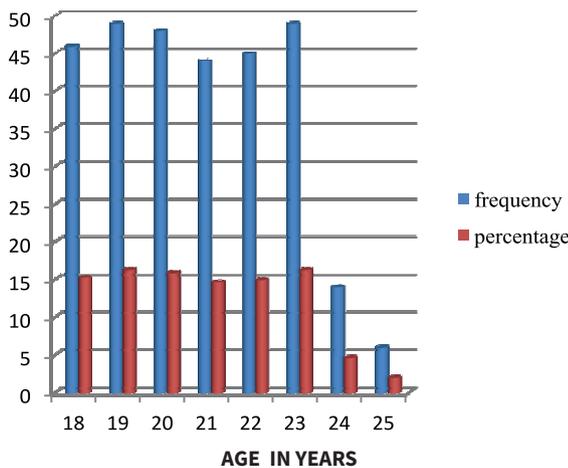


Figure 1a and 1b. Age distribution of the study participants

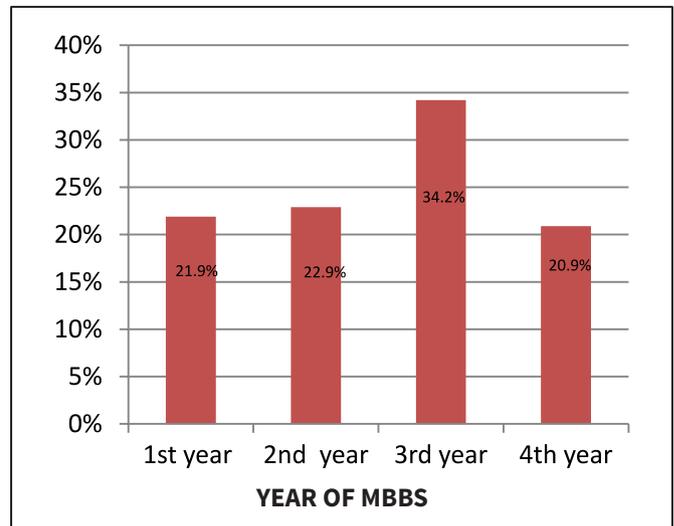


Figure 2. Year-wise distribution of students

The mean age of participants in PMDD group was 20.86 with SD of 2.48 while those in without PMDD the mean age was 20.72 with SD of 2.56. The mean HAM-D score in the group with PMDD was 13.24 with SD of 4.98. The HAM-D score in the group without PMDD was 5.26 with SD of 2.45. The mean HAM-A scores in PMDD group was 16.86 with SD of 5.11 while the mean anxiety scores for the group without PMDD was 11.09 with SD of 2.75.

Cross tabulation of age in years with PMDD showed highest frequency of PMDD in the 19 old students (30.2%) and least in 21 year old female students (1.2%). (Table 2)

Table 2: Comparative analysis of relation of age with PMDD

Age in years	PMDD ABSENT		PMDD PRESENT	
	Frequency	%	Frequency	%
18	43	18.1	3	4.8
19	30	12.6	19	30.2
20	37	15.5	11	17.5
21	43	18.1	1	1.6
22	34	14.3	11	17.5
23	33	13.9	16	25.4
24	12	5.0	2	3.2
25	6	2.5	0	-
Total	238	100	63	100

Cross tabulation analysis of PMDD with year of MBBS showed highest percentage of 4th year students (25.4%) with PMDD and lowest in 3rd year students (16.4%) as represented below (Table 3).

Table 3: Comparative analysis of PMDD with year of MBBS

YEAR OF STUDY	PMDD ABSENT (frequency and % within group)	PMDD PRESENT (frequency and % within group)	TOTAL (frequency and % within group)
1st year	50(75.8%)	16(24.2%)	66(100%)
2nd year	52(75.4%)	17(24.6%)	69(100%)
3rd year	89(86.4%)	14(13.6%)	103(100%)
4th year	47(74.6%)	16(25.4%)	63(100%)
Total	238(79.1%)	63(20.9%)	301(100%)

Comparison of the two groups with and without PMDD and HAM-D scores revealed significant findings of 46.0 % mild depression, 28.6 % moderate depression and 7.9 % severe depression in the group with PMDD (Table 4).

Table 4: Comparative analysis of severity of depression and anxiety among the comparison groups (with /without PMDD)

PMDD	DEPRESSION ABSENT (frequency and percentage)	MILD DEPRESSION (frequency and percentage)	MODERATE DEPRESSION (frequency and percentage)	SEVERE DEPRESSION (frequency and percentage)	TOTAL (frequency and percentage)	$\chi^2(3) = 127.7,$ $p \text{ value} = 0.001$
Present	11(17.5%)	29 (46.0%)	18(28.6%)	5 (7.9%)	63(100%)	
Absent	198(83.2%)	38(16.0%)	2(0.8%)	0(0.0%)	238(100%)	
Total	209(69.4%)	67(22.3%)	20(6.6%)	5(1.7%)	301(100%)	

Comparison of both groups on anxiety severity on HAM- A showed higher levels of anxiety was reported in the group with PMDD, 60.3 % having mild anxiety, 34.9 % moderate anxiety and 4.8 % with severe anxiety. Chi square test represented values to be statistically significant (Table 5).

Table 5: Severity of anxiety among the comparison groups

PMDD	MILD ANXIETY (frequency and percentage)	MODERATE ANXIETY (frequency and percentage)	SEVERE ANXIETY (frequency and percentage)	TOTAL (frequency and percentage)	$\chi^2(2) = 68.2$ $p \text{ value} = 0.001$
Present	38(60.3%)	22 (34.9%)	3(4.8%)	63(100%)	
Absent	230 (96.6%)	6 (2.5%)	2(0.8%)	238(100%)	
Total	268(89.0%)	28 (9.3%)	5(1.7%)	301(100%)	

Discussion

The findings of the present study suggest that the prevalence of PMDD is higher in medical students (20.9%). The present study reports a higher finding than that reported by Raval *et al.* in college students in Gujarat (3.7%)⁹ , Banerjee *et al.* in Indian women (6.4%),³ Niser *et al.* (5.8%)¹⁴ among female medical students, comparable findings with studies in Croatia (17.2%)¹⁵ and Pakistan (18.2%)¹⁶, Thailand (25.2%)¹⁷ and lower finding as compared to studies in Nigerian medical students (36.1%)¹⁸ and Iranian adolescents (37.2%).⁹ This suggests the relationship and influence of culture on the subjective perception of pre-menstrual complaints in different regions of the world in populations belonging to similar age group. The present finding might be a result of the high stress level faced by medical students as compared to other professional / degree courses which could have

influenced the findings of the study.

While on assessing the socio-demographic values, highest percentage of 19 year old reported PMDD (30.2%) which could be an incidental finding because of higher representation of this age in our study. The present study reports highest percentage of students in final year reporting PMDD which could be due to the pattern in MBBS curriculum and higher stress levels faced by these students. No significant differences were observed on other socio-demographic variables. Our study shows comparative higher levels of depression and anxiety in the group of students suffering from PMDD with findings of 46% versus 16% mild depression, 28.6% versus 0.8% moderate depression ,7.9% versus 0.0% severe depression in students with and without PMDD respectively. The present study reports higher co- morbid depression

in medical students as compared to study among medical students in Iran even though higher rates of depression was reported in both studies in the group with PMS.¹⁹ The lower findings in the Iranian study was probably because of a less strict criteria for PMS than that used in present study which predicts lower depression on account of less functional impairment.

Anxiety levels were similarly found to be higher in students with PMDD with findings of 60.3% reporting mild anxiety and 34.9% moderate anxiety and 4.8% severe anxiety in those with PMDD.

Our findings compare to the study reported by Fava et al.²⁰ where anxiety disorders were reported in 59% of the patients with PMDD with most common diagnosis being GAD, panic disorder and social phobia.

Strengths

- The prospective assessment of PMDD is an advantage of the present study as retrospective studies have confounding factor of recall bias.

Limitations

- Smaller sample size , cross sectional assessment
- The assessments were subjective and not confirmed by personal interviews which could have led to increased findings reported in the study .
- The factors and stressors associated with PMDD, depression and anxiety have not been assessed
- The study was conducted in a particular age group of females belonging to one profession. The extent to which the findings can be applied to general population cannot be commented upon.

Conclusion

PMDD is a common yet neglected diagnosis due to lack of awareness and associated stigma with the associated condition which prevents females from seeking help for this disabling disorder. Medical profession is a stressful one and higher frequency of PMDD is expected in this group. Co- morbid depression and anxiety are frequently associated with PMDD as seen in the present study. Proper awareness about the disorder can help early diagnosis and intervention can help in reducing the health care costs of our economy and help these females function at par with their healthier counterparts.

Future Directions

More studies with greater sample size are needed for finding the exact prevalence of PMDD and associated co- morbidities.

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