e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(3); 1024-1027

Original Research Article

Association of Premenstrual Syndrome and Premenstrual Dysmorphic Disorder with Body Mass Index and Its Effect on Quality of Life: A Cross Sectional Study

Lakshman T.K. [1], Shivkumar N.[2*]

[1] Professor, Department of Obstetrics and Gynaecology, Adichunchangiri Institute of Medical Sciences, Bellur, Karnataka, India

[2] Postgraduate, Department of Obstetrics and Gynaecology, Adichunchangiri Institute of Medical Sciences, Bellur, Karnataka, India

Received: 25-12-2023 / Revised: 23-01-2024 / Accepted: 26-02-2024

Corresponding Author: Dr. Neha S

Conflict of interest: Nil

Abstract:

Introduction: Premenstrual syndrome (PMS) is one of the most common disorders in women at reproductive age that could significantly interfere with activities of daily life. As per retrospective community surveys nearly 90% of women have experienced PMS at least once in life time. Thus the study was conducted to analyse the effects of BMI on PMS and Premenstrual Dysmorphic Disorder (PMDD) .

Aims and Objectives: To assess the frequency of PMS and PMDD among menstruating women and to determine the association between BMI, PMS and PMDD.

Materials and Methods: A cross sectional study was conducted in 268 women in September, 2023. Each one of them were given a Premenstrual Symptom Screening Tool (PSST) questionnaire through with PMS and PMDD was screened and diagnosed, BMI was calculated and association was analyzed statistically between BMI, PMS and PMDD.

Results: The mean age of subjects studied was ± SD: 22.35±5.29 and mean BMI was found to be ± SD: 21.95 ± 3.70. Prevalence of PMS and PMDD was 56% and 28.4% respectively. However the P value of 0.556 indicated that the influence of BMI on PMS is statistically insignificant and P value of 0.992 shows that influence of BMI on PMDD is insignificant as well.

Conclusion: Although there is no significant relation between BMI and PMS .The overweight young females had the highest percentage of severe form of PMS and the lowest percentage of mild forms of PMS while the young females with normal BMI had the highest percentage of mild symptoms and the lowest percentage of severe symptoms of PMS. Thus PMS has a negative impact on quality of life in menstruating women.

Keywords: PMS, PMDD, BMI, QOL.

Introduction

Premenstrual syndrome (PMS) is a disorder with recurring physical and emotional symptoms during the late luteal phase of the menstrual cycle [1]. The World Health Organization (WHO) has classified PMS under the 10th revision of the International Classification of Diseases (ICD-10) [2].According to American College of Obstetrics and Gynecology (ACOG) at least one of the 6 affective and one of the 4 somatic symptoms are reported 5 days before to onset of menstruation in prior 3 cycles and cease within 4 days of onset of menstruation.

Several behavioral symptoms include depression, angry outbursts, irritability, crying spells, anxiety, confusion, social withdrawal, poor concentration, as well as sleep disturbance, thirst, and appetite changes. There are also physical symptoms such as breast tenderness, bloating and weight gain, headache, swelling of hands limbs and foot in addition to pain [3]. However 3–8% reproductive age women reported more severe symptoms like tension, irritability, dysphoria, and liability of mood, which affected their daily activities, without relief from these symptoms over years. This was termed as premenstrual dysphoric disorder (PMDD) [4].

Obesity is a global issue affecting more than 13% of the adult population particularly females (15%). The World Health Organization (WHO) defines overweight and obesity as abnormal or excessive fat accumulation that presents a risk to health [5] .Overweight a prequel to obesity was present in almost 39% of the global adult population with slightly female predominance (40%)[6]. Adiposity may impact risk through the complex interaction of

hormonal and neurochemical factors, but it is not known if adiposity increases a woman's risk of developing PMS and PMDD [7].

Hence, this study aimed to find the relationship of PMS and PMDD with BMI and its effect on the QOL [3].

Aims and Objectives:

- To assess the prevalence of PMS and PMDD among menstruating females.
- To determine the association between BMI, PMS and PMDD.
- To study impact of PMS on quality of life among the subjects.

Material and Methods:

A cross sectional study was conducted in 268 women at Adichunchungiri Institute of medical sciences in September, 2023. Ethical committee clearance was taken from the institutional ethical committee, AIMS, Bellur before commencing the study. A Google questionnaire was circulated among the subjects which included data regarding sociodemographic status, height, weight, Body mass index(BMI), nature of cycles, marital status and The Premenstrual Syndrome Screening Tool(PSST). The tool consisted of various premenstrual symptoms including the emotional and physical component.

The criteria for PMDD: At least one of the four core symptoms (irritability, dysphoria, tension, liability of mood) as severe and at least 4 additional symptoms as moderate to severe. The symptoms interfered severely with their ability to function in at least one of five domains (work efficiency/ productivity, social life, home responsibilities, relationship at work, or relationships at home).

The criteria for Moderate to Severe PMS: At least one of the four core symptoms (irritability, dysphoria, tension, liability of mood) as moderate to severe and at least 4 additional symptoms as moderate to severe. The symptoms interfered moderate to severely with their ability to function in at least one of five domains (work efficiency/productivity, social life, home responsibilities, relationship at work, or relationships at home).[8]

Their severity was assessed to obtain a score in order to screen and diagnosed PMS and PMDD. 268 responses were tabulated, BMI was calculated and assessed. Statistical association of BMI with PMS /PMDD was analysed. Chi-square or Fisher Exact test was used to study the significance of study parameters. The impact of PMS on quality of life was also studied in these subjects.

Inclusion Criteria:

- Age between 12 years and 50 years.
- Subjects with or without medication for PMS.
- Willingness to participate in the study.

Exclusion Criteria:

- Refusal to participate in the study.
- Use of psychotropic medications in the past two months.
- Pregnancy or menopause.

Results

The mean age of subjects studied was 22.35±5.29. Minimum age being 12years and maximum age being 50years. Age distribution showed maximum subjects in the range of 18 to 30years.

Table 1: Distribution of subjects according to age groups

Age in years	No. of subjects	Percentage
12-20	122	45.5%
21-30	129	48.1%
31-40	14	5.2%
41-50	3	1.1%
Total	268	100.0

Mean ± SD: 22.35±5.29. Further study subjects were divided into 4 groups based on their BMI. Categorized into four categories 13.8% were underweight, 67.2% had BMI within normal range, 14.9% were overweight and 4.1% are obese with mean BMI of ± SD: 21.95 ± 3.70 as shown in Table 2.

Table 2: Distribution of subjects according to BMI

BMI(Kg/m2)	No. of Subjects	Percentage
<18.5	37	13.8%
18.5-24.9	180	67.2%
25.0-29.9	40	14.9%
>30	11	4.1%
Total	268	100.0

Mean ± SD: 21.95 ± 3.70. According to the criteria as mentioned in the questionnaire 150 out of 268 subjects were diagnosed with PMS with the prevalence of 56% and 76 were diagnosed with PMDD with the prevalence of 28.4%.

Table 3: Association of PMS/PMDD in relation to BMI of subjects studied.

Variables	BMI (kg/m^2)				Total	P Value
	Under Weight	Normal Weight	Over Weight	OBESE		
Criteria -PMDD						
No	25(67.6%)	129(71.7%)	30(75%)	8(72.7%)	192(71.6%)	0.912
Yes	12(32.4%)	51(28.3%)	10(25%)	3(27.3%)	76(28.4%)	0.912
Criteria -PMS						
No	15(40.4%)	76(42.2%)	21(52.5%)	6(54.5%)	118(44%)	0.556
Yes	22(59.5%)	104(57.8%)	19(47.5%)	5(45.5%)	150(56%)	0.556
Total	37(100%)	180(100%)	40(100%)	11(100%)	268(100%)	

Discussion

PMS is among the commonest gynecologic complaints in young women. Findings of our present study showed a high percentage of subjects (71.3%) experienced premenstrual symptoms out of which 74.3% sought medical care.

Although the association between PMS and BMI was statistically insignificant, which is similar to a retrospective community survey conducted by Arati M, Mesquita JC et al using MMDQ, and SF-36 questionnaire concluded that PMS affects the QOL negatively, however no association with BMI was observed [4].

A cross-sectional study was conducted in Virginia; prevalence of PMS was 10.3 percent. Obese women (BMI>30) had nearly a three-fold increased risk for PMS than non-obese women, whereas in our study mean BMI of subjects is 21.95 which indicated majority of the subjects (67.2%) have normal BMI and hence no association was found. PMS is observed in subjects irrespective of high BMI [9]

In our study mean age group studied is 21.95 years with 67.2% having normal BMI and 14.9% constituting obese individuals out of which 85.1% had regular cycles and 14.9% had irregular cycles similar to a study conducted by Ganesan DK et al in which 44% of the participants have their BMI within normal range and 8% are obese. Irregular menstrual pattern was present in 13% of the study participants. Thus, a strong association was found between BMI and menstrual irregularity as well [6].

In our study 268 subjects were divided into four groups A, B, C and D according to their BMI as underweight, normal, obese and overweight respectively. The responses on the severity of symptoms were tabulated. In group A 18% had no symptoms, 28% had mild symptoms, 30% were said to have moderate symptoms whereas 26% had severe symptoms. In group B 14% did not report to have any symptoms, 44%, 29% had mild and moderate symptoms respectively.

Remaining had severe symptoms. Among overweight subjects 10% had no symptoms, 16% had mild symptoms, and 29% had moderate symptoms, while 45 % of them had severe symptoms. In group D only 10% of them did not have any symptoms whereas maximum subjects i.e 51% reported to have severe symptoms. P-value 0.01, its indicate that severity was more in the Group D, Group C and Group A than group A. Normal weight group have low severity of PMS.

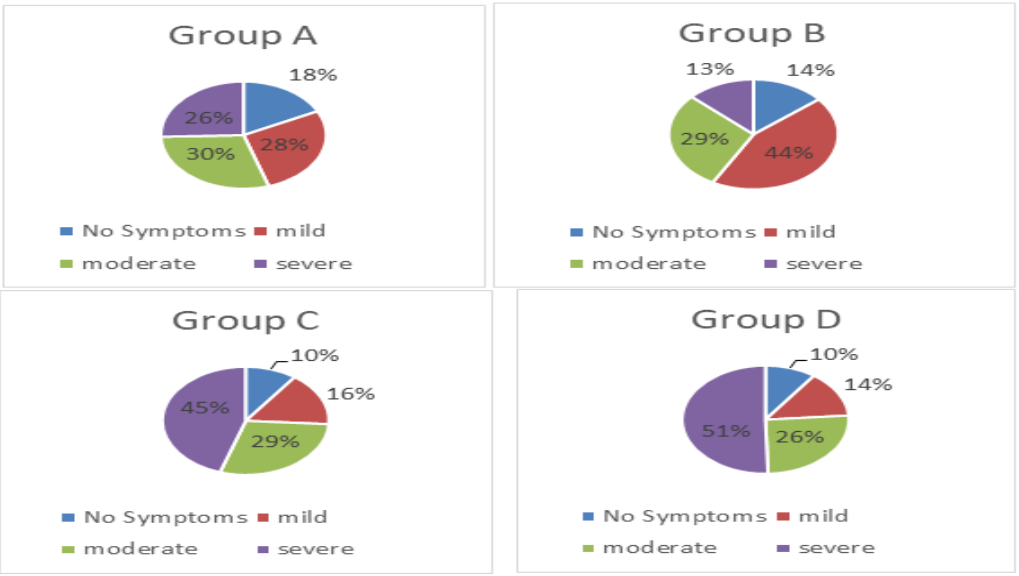

Figure 1:

The results of present study can be explained by several known mechanisms. Adipose tissue converts androgens into estrogens, body weight affects estrogen metabolism, lighter women have less effect on estrogen metabolism and obese women are more likely to affect estrogen metabolism [9]. Obese women, who are less likely to exercise, are at increased risk of stress, depression, and sleep deprivation, perhaps one of the reasons why PMS is higher in people with high BMI than normal BMI. In the other word, sedentary life style is one of the reasons for PMS [10]. The studies showed that the two neurotransmitter systems implicated in the genesis of the symptoms are the GABAergic and the serotonergic systems. Progesterone metabolites formed by the corpus luteum of the ovary and in the brain bind to a Nonsteroidal-binding site on the membrane of the gamma-aminobutyric acid (GABA) receptor, changing its configuration, making it resistant to further activation and eventually decreasing GABA-mediated inhibition. Similarly, the progestogens in some hormonal contraceptives are also thought to adversely affect the GABAergic system. The lowering of serotonin levels can give rise to PMDD-like symptoms. Thus, agents that increase serotonin levels especially during luteal phase are implicated in treating PMDD [11]. Another study reported that caffeine could reduce serotonin synthesis. The condition could exacerbate the serotonin decrease and worsen PMS/PMDD symptoms. Thus emphasis should be made on lifestyle modifications, weight loss and exercise in order to overcome PMS and PMDD [12].

Conclusion

Although there is no statistically significant relation between BMI and PMS. Overweight young females had severe symptoms of PMS and the lowest percentage of milder severity of PMS while the young females with normal BMI had the highest percentage of mild forms of PMS and the lowest percentage of severe symptoms of PMS. Thus, PMS has a negative impact on quality of life in menstruating women.

References

1. Mizgier M, Jarzabek-Bielecka G, Jakubek E, Kedzia W. The relationship between body mass index, body composition and premenstrual syndrome prevalence in girls. Ginekol Pol. 2019; 90(5):256-261.
2. Harshada Thakur, Priyanka Pareek, Mehmood G Sayyad & Suhas Otiv. Association of Premenstrual Syndrome with Adiposity and Nutrient Intake Among Young Indian Women, International Journal of Women's Health, 2022; 14: 665-675.
3. Seedhom AE, Mohammed ES, Mahfouz EM. Life Style Factors Associated with Premenstrual Syndrome among El-Minia University Students, Egypt. ISRN Public Health. 2013; 2013:1–6.
4. Arati M, Mesquita JC. Association of Premenstrual Syndrome with Body Mass Index, and its Effect on the Quality of Life: A Cross-sectional Study. J South Asian Feder Obst Gynae 2019; 11(6):371–374.
5. Chooi YC, Ding C, Magkos F. The epidemiology of obesity. Metabolism. 2019 Mar; 92(92):6–10.
6. Ganesan DK, Krishnan GK, Chitharaj RR, Boopathirajan R. A cross-sectional study on relationship between body mass index and menstrual irregularity among rural women in Tamil Nadu. International Journal of Community Medicine and Public Health. 2019 Oct 24; 6(11):4635.
7. Bertone-Johnson ER, Hankinson SE, Willett WC, Johnson SR, Manson JE. Adiposity and the Development of Premenstrual Syndrome. Journal of Women's Health [Internet]. 2010 Nov; 19(11):1955–62.
8. Jinko Y, Michiko N, Toshiko K, Fumi H, Keiko U. Cross-Sectional Questionnaire Study on PMS/PMDD and Stress Factors in the Life of Female Medical Students. International Journal of Women's Health and Wellness. 2021 Dec 31; 7(2).
9. Masho SW, Adera T, South-Paul J. Obesity as a risk factor for premenstrual syndrome. Journal of Psychosomatic Obstetrics & Gynecology. 2005 Mar; 26(1):33–9.
10. Dehnavi Z, Rad M, Sabzevary M. Factors associated with premenstrual syndrome in female high school students. Journal of Education and Health Promotion. 2018; 7(1):64.
11. Rapkin AJ, Akopians AL. Pathophysiology of premenstrual syndrome and premenstrual dysphoric disorder. Menopause international [Internet]. 2012; 18(2):52–9.
12. Dinh Trieu Ngo V, Bui LP, Hoang LB, Tran MTT, Nguyen HVQ, Tran LM, et al. Associated factors with Premenstrual syndrome and Premenstrual dysphoric disorder among female medical students: A cross-sectional study. Garitano Gutierrez I, editor. PLOS ONE. 2023 Jan 26; 18(1): e0278702.