



Role of Anthropometric Indices in the Appearance of Premenstrual Syndrome in College Students

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Abstract

Background: Menstrual cycle is usually a cyclical process in the reproductive stage of a woman. In the luteal phase of menstrual cycle, large number of symptoms appear and end as soon as the menses start, called as premenstrual syndrome. These symptoms last for 7-10 days of menstrual cycle and are not associated with any organic lesions in the pelvic cavity but disturb the daily activity of women. The aim of this study is to find out whether there is any role of anthropometric indices in appearance of premenstrual syndrome (PMS) in college going students.

Materials and Methods: A total of 60 participants have been selected in the age group of 17-22 years and they have been given with Daily record of severity of problem (DRSP) questionnaire and asked to record their symptoms for 3 consecutive menstrual cycles and then the anthropometric indices like height, weight, BMI, arm circumference, waist circumference, hip circumference, waist to hip ratio, waist to height ratio were measured. The statistical analysis was derived by using SPSS software. Mann Whitney's test was performed to assess the role of anthropometric indices in appearance of premenstrual syndrome.

Results: After the analysis of DRSP questionnaire it was observed that the prevalence of PMS in the given sample is 0.2166. The p values of anthropometric indices are not significant.

Conclusion: PMS is one of the common disorders among female students in the age group of 17-22 years, having prevalence of 0.2166. After the study was completed it was found out that there is no significant relation between PMS and anthropometric indices.

Keywords: Premenstrual Syndrome; Anthropometric Indices; DRSP

Introduction

Premenstrual syndrome (PMS) is a psychoneuroendocrine disorder of unknown etiology, often noticed prior to menstruation. This cycle appears with large number of symptoms and last for 7-10 days of menstrual cycle [1]. The symptoms usually occur during the luteal phase of the menstrual cycle, the day when the egg is released from the ovary and ends as soon as the menstrual flow starts. Premenstrual syndrome is one of the most common disorders of reproductive age that can be seen in different intensities in 85-90% of women.

The exact etiology of PMS is not known. It has been postulated that it represents a syndrome which is the result of multiple biochemical abnormalities [3].

Few among those abnormalities include:

- Excess of estrogen or deficiency of progesterone in the luteal phase
- Increased intolerance to carbohydrate during the luteal phase
- Pyridoxine deficiency

- Increased production of vasopressin, aldosterone, prolactin and systemic prostaglandins
- Fluctuation in the level of endorphin levels
- Skin problem
- Gastrointestinal symptoms
- Abdominal pain

Among the various diagnostic criteria of PMS, American College of Obstetricians and Gynecologists (ACOG) is the widely used one. According to ACOG [1], PMS is diagnosed only when:

- Symptoms are not related to any organic lesions
- Symptoms regularly occur during the luteal phase of each ovulatory menstrual cycle
- Symptoms must be severe enough to disturb the life style of the woman
- There must be Symptom free period during the rest of life.

PMS is the name given to collection of physical, cognitive, affective and behavioral symptoms that occur cyclically with each menstrual cycle.

Cognitive

- Difficulty in concentrating
- Feeling overwhelmed or out of control

Emotional

- Depression
- Angry outbursts
- Irritability
- Anxiety
- Confusion
- Social withdrawal
- Poor concentration
- Insomnia
- Increased nap taking

Physical

- Food cravings
- Breast tenderness
- Bloating
- Weight gain
- Swellings of hand and feet
- Fatigue

These symptoms have great potential to interfere with personal, social and occupational functions. These changes occurring in youths (15-24 years) will impact their physical, emotional, social development as well as their academic performance. This may instill a negative approach towards menstruation.

Epidemiological surveys reports 80% of women in reproductive age group have some symptoms attributed to premenstrual phase of menstrual cycle. Though it affects such a vast majority of women in reproductive age group, the degree of discomfort varies with each individual. About 80% of women report mild degree of distress, 20-40% report moderate degree of distress and in 10% of women distress is severe enough resulting in poor quality of life.

Several factors including genetic, environmental, psychological, biological, and social factors are documented to play a role in occurrence of PMS. Genetics plays an important role. Women with a history of PMS in mothers are more likely to report PMS (70%) in comparison to women with negative family history (37%) [4].

Many researches show the impact of various Life style factors on PMS such as smoking, stressful life, lack of exercise, lack of sleep, diet high in caffeine, alcohol, salt etc. However it's not clear whether these factors cause PMS or it may increase the severity of symptoms.

The relation of anthropometric indices like height, weight, body mass index (BMI), arm circumference, hip circumference, waist to height ratio, waist hip ratio to PMS is yet ambiguous [23]. These indices are becoming most of our concern in these days due to increase in the amount of stress a person is being exposed to, lack of time for individuals to exercise and changing dietary habits etc. Due to these, individuals mainly women tend to develop the risk of weight gain and become vulnerable to many health issues like PCOS, obesity, insomnia, mental depression etc. The lifestyle modification measures can be recommended and can act as the best non-medicinal intervention when the cause and effect relationship is formulated. Hence the objective of this study is to determine the role of anthropometric indices in the appearance of premenstrual symptoms.

Review of Literature

PMS is usually characterized by mood changes, anxiety, and somatic symptoms experienced during the luteal phase of menstrual cycle and stop as soon as the menses start.

The etiology of which remains an enigma, despite considerable research effort. There are many hypotheses regarding the etiology of PMS which include

- Alteration in the level of estrogen and progesterone starting from the mid luteal phase.
- Neuroendocrine factors:
- Serotonin
- Endorphins
- γ -aminobutyric acid (GABA) [10]
- Psychological and psychosocial factors may produce behavioral changes [1]

Prevalence of PMS

The prevalence of PMS was 18.4%. Moderate to severe PMS was 14.7% [5] in a study conducted in Gujarat.

prevalence of PMS was reported 40% in Europe, 85% in Africa, 46% in Asia and 60% in South America [6].

Difference between PMS and PMDD

All the symptoms like mood swings, bloated abdomen, breast tenderness, cry spells etc., comes around at the same time i.e. during the luteal phase every month and stops as soon as the menses start comes under the condition called PMS.

If the PMS symptoms are so extreme that they stop you from doing the normal things that you do at work or at home, or if the symptoms affect the relationship with the people in your life, then it is considered as premenstrual dysphoric disorder (PMDD) [7].

Diagnosis of PMS

There is no particular diagnostic test for PMS so far [2]. The only way to diagnose the PMS and its severity is by recording the symptoms [8] for at least two consecutive months. The symptoms should start at the luteal phase and should stop as soon as the menses commence only then they the women is said to have been suffering from PMS or PMDD [9].

Role of lifestyle in PMS

A healthy lifestyle is the first step for managing PMS. For most of the woman change in lifestyle controls the symptoms [11].

Dietary changes in relieving the PMS

DO'S

- Drink plenty of fluids (water or juice) to help reduce bloating, fluid retention, and other symptoms
- Eat frequent small meals
- Eat balanced diet with extra whole grains, vegetables and fruits (iv)A health care provider may recommend nutritional supplements
- Get regular aerobic exercise throughout the month to help reduce the severity of PMS symptoms [12].

Don'ts

- Avoid soft drinks, alcohol and caffeine
- Avoid over eating
- Avoid over intake of salt and sugar

Does sleep have any role in PMS

Normal sleep is essential for an individual's physical and mental wellbeing. Although there is a variation in sleep requirements amongst individuals, most adults require approximately seven hours on a regular basis to have good health. Women have more disturbed sleep than men.

Menstrual-related hormonal fluctuations may be responsible for this sleep disturbance [13,14] sleep onset insomnia, frequent nighttime awakenings, and non-restoration of sleep. These sleep related problems also have daytime consequences in the form of poor concentration, daytime sleepiness, decreased alertness and poor performance at work [14,15].

Effect of relaxation therapies

The relaxation therapies are usually used to lower down the levels of stress, fatigue. The therapies include meditation, yoga and exercise. By the research conducted previously there exists a relation between relaxation therapy and PMS and there is reduction in severity of the symptoms gradually [16].

Effect of exercise

Physical activity has attracted the attention of women [17] in reducing the symptoms of PMS. It seems that physical activity affects the mechanisms of brain endorphins and improves mood symptoms. Physical activity by increasing endorphins and reducing the symptoms of adrenal cortisol leading to the improvement of PMS [18]. The results of most studies showed that physical activity can improve PMS symptoms [19].

Conditions that MIMIC PMS

There are few conditions which mimic PMS includes depression, idiopathic edema, chronic fatigue, hypothyroidism, irritable bowel syndrome [20].

Treatment to PMS

Changes in the life style usually relieve the symptoms, but based on severity of the symptoms doctors prescribe antidepressants, nonsteroidal anti-inflammatory drugs (NSAIDs), diuretics, and hormonal contraceptives [21].

Aim

To determine the role of anthropometric indices in the appearance of premenstrual syndrome in college students of age group 17-22.

Objective

- To calculate the prevalence of premenstrual syndrome (PMS) in college going girls in the age group of 17-22
- To assess the relationship between the anthropometric indices namely height, weight, body mass index (BMI), arm circumference, waist circumference, hip circumference, waist hip ratio (WHR), waist to height ratio (WHTR) to premenstrual syndrome (PMS).

Methodology

- **Type of study:** Cross sectional observational study
- **Study design:** Study followed a descriptive survey design
- **Setting of the study:** Study was carried out among the undergraduate students of MNR Homoeopathic medical college, Sangareddy, Telangana

- **Population of the study:** The population comprised of female students of age between 17-22 years.
- **Sample size:** The sample size was 60.
- **Sampling technique:** Cluster sampling technique was adopted for this study. Randomization was achieved by deploying lottery method. The names of all subjects in the population were written down on lots and 60 were chosen randomly, from each cluster.

Selection criteria

- **Inclusion criteria:** Willingness to participate in the study, regular menstrual cycles (21-35 days), age between 17 to 22 years.
- **Exclusion criteria:** Any organic pelvic lesion, any generalized disease like hyper/hypothyroidism, diabetes etc., history of any long standing medical therapy in last 3 months.

Data collection procedure- It consisted of three parts-

- Socio demographic pro forma -It had basic information of the participant such as name, age, address, contact no.
- Daily record of severity of problem (DRSP) Questionnaire [22] – was filled by participants for 3 consecutive months starting from November 2019 which facilitated to divide participants into 2 groups namely PMS and non PMS.
- Anthropometric measurements- including height, arm circumference, waist circumference and hip circumference were measured of all participants in centimeter with a non-elastic tape with a precision of 0.1 cm and weight in kilogram with a precision of 0.1 kg. BMI, WHR and WHTR were calculated using formulae.

Confidentiality

Confidentiality of the data was maintained.

Plan of analysis

SPSS (Version 23, IBM Company, Armonk, NY) software was used for data analysis. Descriptive statistics such as percentage, means were calculated. Mann Whitney's test was performed to determine the relationship between PMS and anthropometric indices. $P < 0.05$ will be considered statistically significant.

Daily Record of Severity of Problems related to Premenstrual Syndrome																																					
Name																																					
Month																																					
Symptoms	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
Felt depressed, sad, down, or blue																																					
Felt hopeless																																					
Felt worthless or guilty																																					
Felt anxious, tense, keyed up, or on edge																																					
Had mood swings (e.g., suddenly felt sad or tearful)																																					
Was more sensitive to rejection or feelings were more easily hurt																																					
Felt angry, irritable																																					
Had conflicts or problems with people																																					
Had less interest in usual activities (e.g., work, school, friends, hobbies)																																					
Had difficulty concentrating																																					
Felt lethargic, tired, fatigued, or had a lack of energy																																					
Had increased appetite or overate																																					
Had cravings for specific foods																																					
Slept more, took naps, found it hard to get up when intended																																					
Had trouble getting to sleep or staying asleep																																					
Felt overwhelmed or that I could not cope																																					
Felt out of control																																					
Had breast tenderness																																					
Had breast swelling, felt bloated, or had weight gain																																					
Had headache																																					
Had joint or muscle pain																																					
At work, school, home, or in daily routine, at least one of the problems noted above caused reduced productivity or inefficiency																																					
At least one of the problems noted above interfered with hobbies or social activities																																					
At least one of the problems noted above interfered with relationships with others																																					
Menstrual flow: H = heavy, M = medium, L = light or spotting; leave blank for no bleeding																																					
Totals																																					

Figure 1: DRSP questionnaire.

Ethical consideration

Ethical clearance from the institutional ethics committee was taken. Informed consent was taken from the participants.

Observation and Result

After tracking the DRSP questionnaire for 3 consecutive menstrual cycles it was observed that out of the 60 participants 13(22%) were having premenstrual syndrome whereas and 47(78%) fell into the category of non-PMS. Hence the prevalence of PMS in this study population is 0.2166.

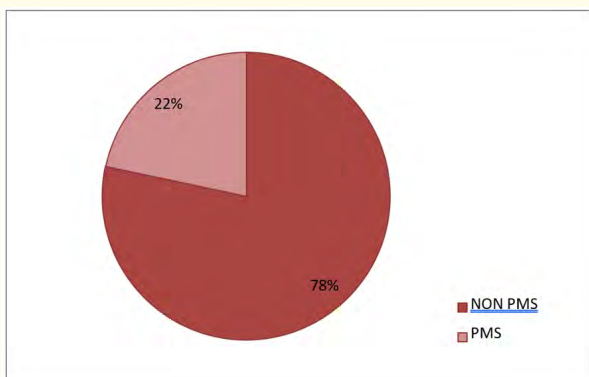


Figure 2: Percentage of girls with and without PMS.

The means of anthropometric indices namely weight (Kg), height (cm.), BMI (Kg/m²), arm circumference (cm), hip circumference (cm), waist circumference (cm), waist to hip ratio and waist to height ratio of both PMS and Non PMS groups are compared in the following bar diagram.

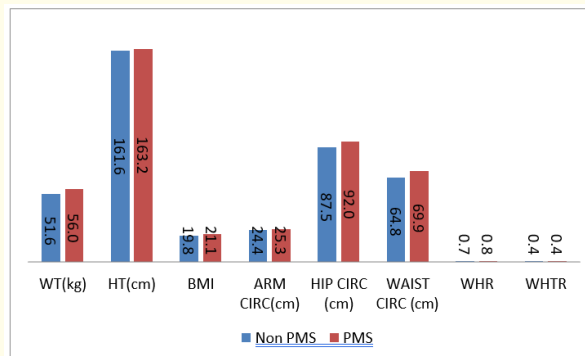


Figure 3: The mean value of both PMS and Non-PMS group.

The mean + standard deviation and P values of all anthropometric indices are mentioned in table 1 below.

Anthropometric Indices	With PMS (n = 13)	Without PMS (n = 47)	P
	(n%)	(n%)	
Weight in kg	56 ± 13.844	51.61 ± 8.342	0.33
Height in cm	163.15 ± 5.213	161.61 ± 7.376	0.628
Body Mass Index (BMI)	21.09 ± 5.313	19.8 ± 3.172	0.622
Arm Circumference in cm	25.3 ± 4.308	24.425 ± 2.9	0.612
Waist Circumference in cm	69.92 ± 10.4	64.787 ± 6.75	0.424
HIP Circumference in cm	92 ± 10.37	87.531 ± 8.469	0.145
Waist to hip ratio (WHR)	0.758 ± 0.064	0.749 ± 0.112	0.311
Waist to height ratio (WHTR)	0.429 ± 0.069	0.401 ± 0.045	0.254

Table 1: (n%) value and p values of anthropometric indices.

Where the data are expressed as (n%) or mean ± SD.

SD: Standard Deviation, PMS: Premenstrual Syndrome.

Discussion

This study was planned to find out if there was any role of anthropometric indices in appearance of symptoms of PMS and the assessment was made using DRSP questionnaire.

In, the present study the prevalence of PMS was reported as 21.6% as compared to the prevalence in study conducted in Gujarat where it was 18.4% [5]. A study conducted in Tamil Nadu involving 500 health-care and non-health-care students aged 17-27 years reported 47.6% and 52.3% prevalence of PMS, respectively [41], which is higher as compare to the present study.

The p values of anthropometric indices were calculated (Table 1) and it is observed that the p values are not statistically significant (>0.05).

This means we retain the null hypothesis which says that “there is no role of anthropometric indices in the appearance of premenstrual symptoms” and reject the alternative hypothesis. As the significant relation between anthropometric indices and PMS was not found it is very much necessary to study and understand the probable risk factors for the appearance of the premenstrual syndrome. The risk factors can be anything ranging from genetic makeup to faulty dietary habits [12], to lack of sleep [14,15], to emotional stress etc. As the study population was medical students the factors like staying away from home, hostel/mess food, academic stress, peer pressure should also be considered for study.

Conclusion

The prevalence of PMS among the study population is 0.2166.

There is no significant relationship between anthropometric indices and PMS.

Limitation of Study

- As the sample of study was small, it is not possible to make generalized conclusion that there is no relation between the anthropometric indices and PMS.
- There was time limit.
- Data collection could have been more elaborated to incorporate other risk factors.

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