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A Study of common Pre-menstrual Symptoms & their severity (Pain) with relation to VAS in Young Adult Medical Females

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Abstract
Introduction: *Premenstrual Syndrome (PMS) is a common disorder in childbearing age. Based on different definitions, it is accompanied with specific annoying symptoms that clearly emerge after ovulation and decrease or end with the onset of menstruation. Methods: The present study aimed to determine common premenstrual symptoms & their severity (pain) with relation to VAS in 200 female medical students of GMC, Kannauj in the academic year 2016. Two Hundred female students studying in medical college were randomly selected. The subjects completed two questionnaires of Demographic Information and Symptom Assessment based on the criteria of ACOG and DSM-IV. The pain severity was assessed by using Visual Analogue Scale(VAS).Results: According to the mentioned criteria, among medical students, the most common mood symptom (emotional) was mood variability("35%") and somatic symptom (physical) was Abdominal Pain("38%")& pain felt by students was mild("45%").Conclusion: Given the high prevalence of PMS and its effect on various aspects of life, we highly recommend informing young individuals through books, workshops and media in order to identify the symptoms, provide information about methods of control and treatment of this syndrome, and apply non-interventional treatments and methods to reduce the symptoms.*

Keywords: *Premenstrual Syndrome, Prevalence, Severity, Visual Analogue Scale(VAS),American College of Obstetrics and Gynaecology (ACOG), Diagnostic and Statistical Manual of Mental Disorder-IV (DSM-IV).*

Introduction

Nowadays, women's health is one of the main objectives of the health and is an indicator of social and economic development. Most women may experience cyclical changes in their physical, mental and behavioural status during their childbearing years[1]. Few women develop some nonspecific features about a week before the onset of menstrual bleeding that are combinely called as premenstrual syndrome (PMS) or premenstrual dysphoric disorder(PMDD)[22].

The usual featuresare edema, painful or swollen breasts, depression, loss of concentration, irritability, headache, behavioural changes & emotional disturbances. These features disappear

within 1-3 days after the start of menstruation[22] .These changes lasted for 2 days (up to 4 days) after the onset of menstruation [8]. Before Christ, Hippocrates, for the first time, mentioned a series of physical and psychological changes in his writing[9]. In 1931, Robert Frank, an American physician in the New York Academy of Medicine, raised the issue and stated that it could be due to ovarian dysfunction and used the term luteal action or premenstrual tension for this phenomena. In the same year, a psychoanalysis named Karen Horney stated that this syndrome is the result of sexual desire and power[10,11] and applied the term Premenstrual Syndrome (PMS) to describe it[12]. In mid 1980s, severe form of PMS was called Premenstrual Dysphoric Disorder (PMDD)[13]. Therefore, the premenstrual syndrome is a clinical condition associated with huge uncertainties in the etiology which includes a series of physical, cognitive, behavioral and mood changes that occur periodically in the luteal phase of the menstrual cycle and decrease or end with menstruation. Symptoms range is very broad and affects all aspects of life (family, social, occupational, etc.)[14,15,16]. The condition for PMS diagnosis is the existence of two consecutive periods accompanied with annoying changes[17,18]. Hence, this syndrome is a broad concept with various severity that differs from one individual to another[19]. The cause of this syndrome is still unknown and several theories have been proposed to explain the case. However, there is no laboratory test for this syndrome and diagnosis is just conducted based on the diaries of individual's physical and psychological changes[20]. The 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. Though the salt & water retention has mainly been attributed to PMS, the exact cause of it is not known. Recently, it has been proposed that PMS occurs due to an excess & complex interplay between the sex steroids & brain neurotransmitters[22]. Academic authorities have issued various criteria for PMS.

1) American College of Obstetrics and Gynecology (ACOG) mentioned that this syndrome is at least accompanied with an emotional or a physical symptom that occurs before menstruation and after its initiation, the symptoms may disappear without any pharmacological intervention[2,3].

2) Diagnostic and Statistical Manual of Mental Disorder-IV (DSM-IV) which identifies PMDD and emphasizes on mood disorders stated that the existence of at least 5 symptoms out of 11 symptoms mentioned for this syndrome is essential[4]. These 11 symptoms are stress and anxiety, change of mood (feeling sad or crying all of a sudden), depressed mood, persistent anger or personal clashes, reduced interest in social relationships and work, feeling of immersion or being out of control, change in appetite (overeating or having little appetite), difficulty in sleeping (oversleeping or insomnia), lack of concentration, fatigue and lethargy, and physical symp- toms (chest pain, abdominal pain, joint or muscle pain, frequent urination, weight gain, back pain, acne, nausea, abdominal bloating, chest pain and chest sensitivity, headache)[5,6].Some authors outlined 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]. Diminished academic performance is one of the main complaints attributed to menstrual-cycle problems (Clarke & Ruble, 1978; Moos, 1985). Indeed, Sherry, Notman, Nadelson, Kanter & Salt (1988) found that nearly half of their sample of university students reported considerable premenstrual/menstrual distress symptoms. Richardson (1988a, 1988b; 1989) reported that about 30 per cent of various samples of female undergraduates reported poor academic performance premenstrually. Richardson (1989, p. 321) pointed out that, "Out of 215 respondents, 73 per cent reported that at least one aspect of academic work was disrupted by premenstrual symptoms, and 14 per cent reported that their academic work was disrupted in all six respects. In short, most female students attribute some disruption of their academic work to the occurrence of premenstrual symptoms, and a minority report a severe or widespread disruption of their performance[7].

Materials & Methods

A total of 200 healthy young MBBS female aged 17-25 years(with normal Menstrual Cycle of 30+/-3 days, regular for atleast 6 months prior to this study) studying in Government Medical College, Kannauj were selected for this study.This study was conducted between January and March 2016 after obtaining approval from the ethics committee. Overall, 200 female students were randomly recruited. Participation in the study was voluntary and if a student refused to participate, another student was included. Questionnaires were handed out to the students in the classroom and collected after being filled. A questionnaire was designed with the help of DSM-IV definition of PMDD and existing literature on PMS. The questionnaire consisted of two sections.The Firstpart included somatic symptoms occurring during pre-menstrual period.The secondpart consisted the symptoms of affective(mood). The participants were asked to identify symptoms they had experienced during two weeks preceding their menstruation (3 days, 4-6 days, or 7-14 days before menstruation) in the past three months. The respondents were further asked to rate the severity of the pain on a visual analogue scale: 0=nopain, 2=mild, 4=discomforting, 6=distressing, 8=horrible, 10=excruciating. The prevalence of each symptom was calculated by computing the ratio of the women reporting the symptom to the total number of participants. They were screened for selection on the basis of the following criteria : The subject should not have history of any medical illness like Respiratory or Cardiovascular disease.

- The subjects should not have habits of smoking , alcoholism.
- The subjects should not have Irregular menstrual cycle or Dysmenorrhoea.
- Subjects should not have any history of Hypertension or hypotension and Bradycardia or Tachycardia.
- They should not be on any drug or hormonal therapy.

Basal Parameters were taken to initiate the study. Age, BMI, WHR, Resting Pulse Rate, Resting Blood Pressure were recorded to select the healthy subject for study.

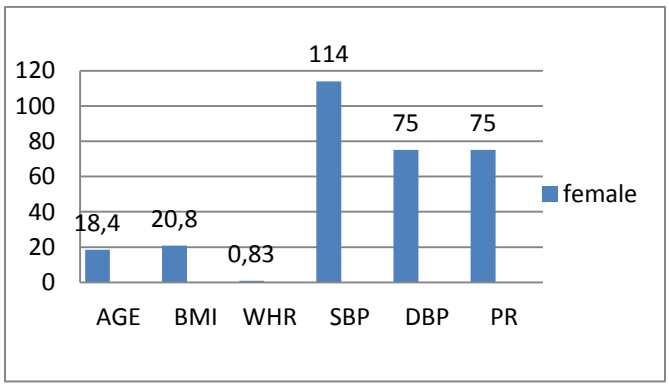
Results

In the present study 200 medical female students of age group 17-25 years were selected for this study. The Basal Parameters are shown in table=1, figure=1.

Table-I Base-line values (Mean± SD) of different parameters in female subjects.

Parameter	FEMALE(N=200)
Age(years)	18.4±.90
BMI(Kg/m²)	20.83±1.33
WHR(WC/HC)	.83±.01
Resting SBP(mmHg)	114.68±4.18
Resting DBP(mmHg)	75.16±3.83
Resting Pulse Rate (min.)	74.80±3.12

Figure-I Graphical Representation of Mean Values of Basal Parameters in Female.



The current study aimed to determine the prevalence of premenstrual syndrome and severity of pain prior to menses in female students. Findings showed that almost all medical students participated in this study had experienced at least one somatic or emotional pre menstrual symptom. The frequency and prevalence of symptoms are represented in Table II. Analyzing the questionnaire indicated that based on ACOG criteria, in 20 individuals "10%", premenstrual somatic symptoms did not exist and other 180 individuals "90%" had premenstrual somatic symptoms. The premenstrual emotional (mood) symptoms were absent in 26 individuals "13%", while 174 individuals "87%" complained emotional symptoms. Moreover, by examining the Visual Analogue Scale (VAS),Figure II, Table III, 56 individuals "28%", did not complain any type of pain while 144 individuals "72%", complained pain. Of which 90 individuals "45%", complained mild pain, 32 individuals "16%" complained discomfort, 14 individuals "7%" complained distress, 2 individuals "1%" complained horrible & 6 individuals "3%" complained excruciating pain. The most common mood symptom (emotional) was mood variability "35%" and the least common mood symptom was sense of immersion or out of control "2%". Moreover, among somatic symptom (physical), abdominal pain was the most frequent symptom i.e. "38%" and pain in rectum was the least frequent somatic symptom "1%". Comparing mood symptoms (emotional) and somatic symptoms (physical) demonstrated that premenstrual syndrome was associated with mood changes "87%" and somatic changes "90%".

Table-II Prevalence (%) of each Pre Menstrual Symptom (Subjects=200)

Somatic symptoms (physical)		Symptoms of affective (mood)	
	Frequency(Percentage)		Frequency(Percentage)
Frequent urination	14 (7)	Mood variability	70(35)
Increased weight	18 (9)	Stable Anger and personal involvement	12(6)
Lower back pain	68 (34)	Depressed mood	40(20)
Acne	26 (13)	Sense of immersion or outside the control	4(2)
Nausea	16 (8)	Difficulty in sleeping	16(8)
Flatulence	8 (4)	Change in appetite (overeating or anorexia)	10(5)
Pain or tenderness of the breasts	44 (22)	Difficulty in concentrating	32(16)
Abdominal pain	76 (38)	Fatigue and lethargy	38(19)
Headache	14 (7)	Decreased interest in social relationships and work	24(12)
Joint and muscle pain	58 (29)	Vaginal secretion	50(25)
Pain in rectum	2 (1)	Anxiety	32(16)
Constipation or Diarrhoea	24 (12)		

Figure-II Visual Analogue Scale (VAS) for Pain Assessment

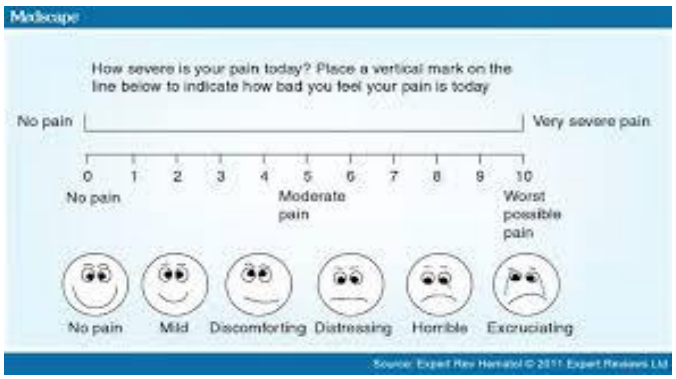


Table-III Pain Distribution (Subjects=200).

Type	Frequency(Percentage)
No pain	56(28)
Mild	90(45)
Discomforting	32(16
Distressing	14(7)
Horrible	2(1)
Excruciating	6(3)

Discussion

The ovarian hormones, E (estrogen) and P (progesterone), have been most frequently implicated in etiological theories of PMS. A relative deficiency of E, and/or P, or a reaction to the withdrawal of either hormone have been proposed as causal factors in the occurrence of premenstrual symptoms (Clare, 1985).Support for the P deficiency hypothesis came from studies which reported lower luteal phase P levels in women with PMS compared with controls (Backstrom & Carstensen, 1974; Munday, Brush, & Taylor, 1981). Later studies, however, found either no differences in P levels between PMS sufferers and controls (Aackstram et al., 1983) or higher than normal P levels in symptomatic women (O'Brien, Selby, & Symonds, 1980). It has also been postulated that premenstrual symptoms are related to P withdrawal, based on findings that withdrawal of exogenous P treatmant can precipitate depression (Hamburg, 1966). However, premenstrual symptams usually begin well before a luteal P levels start to fall (Backstrom et aL, 1983). More ovar, this theory does not explain why only a proportion of women actually complain of symptoms, whereas all women experience P withdrawal during ovulatory cycles. There is also little evidence in support of an E excess hypothesis. In fact, it has been suggested that if a relative excess of E caused PMS, then the symptoms should be most apparent in the pre-ovulatory phase, when circulating levels of E are much higher than concentrations of P (Reid, 1985). There is some support for the role of E withdrawal in provoking menstrual migraines (Somerville, 1972) but no clear evidence that declining levels of E cause PMS(Clare, 1985). The E-P imbalance theory has stimulated a great deal of research since Greene and Dalton (1953) first attributed the cause of PMS to a high E/P ratio. Unfortunately, discrepant findings are a characteristic feature of the studies comparing hormone levels in women with and without PMS. For example, one investigation reported major differences in hormonal profiles between women with PMS and controls, with the symptomatic group showing an E-P imbalance (Dennerstein, Spencer-Gardner, Brown, Smith, & Burrows, 1984). In contrast, a recent study failed to find abnormallevels or patterns of secretion of gonadotropins, E, P, androgens, prolactin, or cortisol in women with premenstrual mood changes (Rubinow, Hoban, Grover, Galloway, Roy-Byme, Andersen, & Merriam, 1988). Acknowledging that a subtle hormonal difference may differentiate women with and without PMS, these authors nonetheless stress that there is no simple hormonal deficiency or excess which can be associated with the condition. ln a careful investigation of symptoms and hormone levels through the menstrual cycle, a very close temporal relationship between the onset of symptoms and the post-ovulatory rise in P was found, although symptoms continued to increase after luteal phase E and P had started to decline (Backstrom et al., 1983). Positive moods were maximal during the pre-ovulatory phase when E levels peaked. The authors concluded that premenstrual symptoms are closely related to the luteal phase but do not vary directly with the rise and fall of either E or P.

The relationship between high levels of E and positive mood also argues against the idea that excess E is responsible for PMC. ln summary, although the underlying pathophysiology of PMC has not been elucidated, there is strong evidence to suggest a relationship between premenstrual symptoms and ovarian function (Vaitukaitis, 1984). Reid (1985) outlined four features of PMS which support what he termed "an obligatory role" for ovarian secretion: (1) PMS does not occur prior to activation of the hypothalamic-pituitary-ovarian axis at puberty; (2) PMS disappears during pregnancy and during periods of hypogonadotropic amenorrhea; (3) PMS continues following hysterectomy if ovarian function is maintained; and(4) PMS disappears following natural or surgical menopause. ln recent years methods of hormone measurement have become increasing lysophisticated, revealing the inherent complexity of the neuroendocrine mechanisms underlying the menstrual cycle (Clare, 1985). Most authors agree that the search for a single hormonal abnormality or biological factor as the cause for PMS has proved fruitless and that it is likely that many social, psychological, and biological factors interact to produce PMC (Janowsky & Rausch, 1985)[23].Differences between the prevalence and various symptoms of this syndrome in different studies may be due to cultural differences, assessment tools, reported symptoms, type of study, method of selecting the population, and/or that some of the participants may not honestly explain their problems and that a number of researchers do not consider some of the symptoms as signs for diagnosing this syndrome [1]

Conclusion

Given that in the present era many women are involved in social, occupational, educational, familial issues and other responsibilities, if one may not find a solution for these individuals, the community will suffer from its many complications. Since there is no permanent cure for premenstrual syndrome, methods for prevention or reduction of symptoms are the best ways to deal with this syndrome; therefore, further research in this area seems essential. Limited number of conducted studies in this area, inability of measuring symptoms directly and application of retrospective and self-reported data which can lead to some memory errors in the recorded data can be mentioned as the limitations of the current study.

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