

The Prevalence and Severity of Premenstrual Syndrome (PMS) and Its' Associated Signs and Symptoms among College Students

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Abstract: Introduction: premenstrual syndrome is one of the most common disorders in women at reproductive age. The aim of this study was to investigate the frequency and severity of this syndrome and its' associated signs and symptoms. **Material & method:** Five hundred undergraduate students at Iran University of Medical Sciences, Department of Nursing-Midwifery and Management-Information schools were included in the study. They were asked to complete the premenstrual daily symptom diary for two months. Premenstrual syndrome was confirmed according to American Psychiatric Association criteria and its severity was calculated for each sign. **Results:** out of 500 students 255 (about 50%) completed and returned the premenstrual daily symptom diary forms .Out of the 255 students 200 (78.43%) were suffering FROM some degree of PMS (62% mild, 36% moderate, and 2% severe). Mood symptoms in 24% and the behavioral symptoms in 3% of them considered to be severe. None suffered from severe physical symptoms. There were significant positive relationship between behavioral symptoms and physical and mood symptoms ($r=0.55$, $r=0.398$, respectively, and $p=0.01$) and also between physical symptoms and mood symptoms ($r=0.305$, $p=0.01$). **Conclusion:** PMS can be considered as a common disorder of reproductive age. Therefore, health professionals should notice mood and behavioral as well as physical symptoms and signs of PMS and provide them with an appropriate consultation or medical intervention if necessary. However additional studies in this field are warranted.

Key words: premenstrual syndrome, menstrual cycle, diagnosis of premenstrual syndrome, PMS signs and symptoms.

INTRODUCTION

PMS is a series of recurrent signs and symptoms which appears monthly, one week before menstruation and disappears by the start of it or during first few days of menstruation. There are several reports on the onset time of PMS but apparently it never lasts more than 16 days, and is followed by a symptom free week after the starts of menstruation (Dickerson *et al.*, 2003; Fredriksen, 2000; Lowdermilk and Perry, 20041). Millions of women are suffering from PMS during their reproductive age (Approximately 40% of women will experience this syndrome in their life span) and severity of the signs among 5-10% is such that can impact daily routine. Three to 5% of PMS sufferers are severely affected with what is called premenstrual dysphoric disorder (PMDD). In both PMS and PMDD, symptoms are reviled at or shortly after commencement of menstrual flow (Bendich, 2000)

Sixty years ago the PMS presentation was first described by Frank (Speroff *et al.*, 1999). The signs and symptoms not only differ among different subjects, but also show variability from a cycle to another among

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individual women. Women during reproductive age are susceptible to PMS and there isn't specific age, but some people believe that young girls are more vulnerable (Benton, 2002; Mortola, 2002). According to some, PMS is most common between the ages 20 and 40. (Rasheed and Al Sowieleh, 2003) Aging, discontinuation of contraceptive pills, pregnancy termination, are some of the aggravating factors (Lowdermilk and Perry, 2004). PMS can influence the person's social life, at work or school. It is reported that in this period suicide, crime, accident, family quarrels and hospitalization are more common because of mental status (Dickerson *et al.*, 2003; Lowdermilk and Perry, 2004).

PMS signs and symptoms are varied. So far, more than 200 signs and symptoms have been recognized for PMS. The most common symptoms include irritability, breast tenderness, tearfulness, abdominal pain, depression or sadness, fatigue, nervousness, change in appetite and edema, but presence of collection of symptoms in person isn't always the reason of PMS (Benton, 2002; Berslin and Lucas, 2003; Derman *et al.*, 2004; Alexander *et al.*, 2000). Diagnosis of PMS is just via record of symptoms during menstrual cycle. According to the American Psychiatric Association (APA) criteria, diagnosis of PMS is firstly, symptoms associated with menstrual cycle and occurs in the last week of this cycle and remit after onset menses and secondly, presence at least five of ten symptoms that mentioned in blow and must be include at least one of the first four symptoms. This symptoms include: 1- mood swings like tearfulness, nervousness 3- anxiety -tension 4- depression -feeling hopeless 5- unconcern to usual activity 6- fatigue- lack of energy 7- concentration difficulties 8- change in appetite - increased appetite 9- insomnia 10 - somatic symptoms like breast tenderness, headache, edema muscle pain and overweight. In addition, symptoms must markedly interfere with person daily activity and relationship with each others and related to menstrual cycle not to psychiatric disorders (Berslin and Lucas, 2003).

Main cause of PMS is still unknown and may be complex and multi factorial (Derman *et al.*, 2004). Different hypothesizes have been offered for it. For example: estrogen hormone elevation, low progesterone hormone, micro nutrients deficiency such as Mg, Ca, vitamin B6, consumption coffee, drinks, caffeine products, salt, alcohol, smoke and neurotransmitter disorder like serotonin (Alexander *et al.*, 2000).

In any kind of treatment the main purpose is to decrease or eliminate the PMS signs and symptoms and their destructive effects on people's activities and proper communications (Derman *et al.*, 2004).

Our main purpose in this article was to know PMS, its frequency, its abundance and the severity of its signs and symptoms also figuring out their correlation with each other among the female students.

MATERIALS AND METHOD

Present study is a part of extensive crossed over trial for comparison between two different PMS treatment methods and placebo. In order to determine the prevalence of PMS and its' severity, a cross sectional study was conducted among female undergraduate students Nursing-Midwifery and Management-Information schools of Iran University of Medical Sciences during 2005-2006. This study was approved by ethical committee of Nursing- Midwifery and Nursing care research center of Iran University of Medical Sciences.

Volunteered students were asked to complete the standard questionnaire. Afterward, two Premenstrual Daily Symptom Diary (PDSD) forms (Dickerson *et al.*, 2003) were handed over to them. They were asked to daily registration of their physical, mood and behavioral signs and symptoms during these two months as well as rating the severity of symptoms from zero (no symptom) to three (sever symptom). The only modification in original PDSD form was deleting "feeling over whelmed" and replacing it by "edema" which was introduced in many other sources as one the most common signs. Moreover, we added two items to the list of physical changes including constipation and diarrhea. By the end of each month, completed forms were gathered separately. Overall, from 500 forms, 255 (approximately 50%) were completed and returned by participants.

PMS diagnosis was made according to American Psychiatric Association (APA) criteria during luteal phase of menstruation within two months of study. The severity of each sign and symptom for each month was added to that of the next month and the average was regarded as severity of that particular sign and symptom. Physical signs (total score of 8), mood signs (total score of 6) and behavioral ones (total score of 5) were reported separately. The overall severity of signs and symptoms (physical, mood and behavioral with the total score of 19) was calculated according to each months score and its average for two months was considered as overall PMS severity

Descriptive statistics were used for describing PMS severity and its signs and symptoms. Pierson's correlation coefficient was used for obtaining correlation between signs. The data analyzed by the SPSS software Ver.10

RESULTS AND DISCUSSION

From 255 students who completed PDS forms for two months and returned them, 200 (78.43%) was suffering from some degrees of PMS. Participants' age was between 18-23 years and there were only 2 cases older than 24 years. More than two third (70.50%) of students who had PMS and 63.64% of them who didn't have PMS were complaining of dysmenorrheal. Most of them had regular menstrual cycle with 21-31 days intervals (83.50% of patients with PMS and 88.50% of normals). Menstrual duration was between 3-7 days for 96% of girls with PMS and 78.2% of normal. Body mass index (BMI) in the most of girls(72.05%) who had PMS were normal (19-26 kg/m²) and more than half of the girls(54.5%) without PMS were thin and their BMI were less than 19 kg/m². 97% of PMS objects and 92.73% of non-PMS were single.

Most of the PMS affected were complaining of mild degree of PMS and severity of their mood related signs and symptoms were higher than physical and behavioral signs and symptoms (table 1).

All of the students were suffering from irritability and depression. Other signs and symptoms which were repeatedly mentioned by them included: increased appetite or polyphagia, nervousness and loosing temper, fatigue or lack of energy, concentration difficulties, loneliness and aloof seeking. These were reported by 95% or more of the students (table 2).

Table 1: The frequency and severity of PMS and its' signs and symptoms.

	<i>Mild N (%)</i>	<i>Moderate N (%)</i>	<i>Severe N (%)</i>	<i>Total N (%)</i>
<i>Mood</i>	57(28.6)	119(59.5)	24(12.0)	200(100)
<i>Behavioral</i>	108(54.0)	89(44.5)	3(1.5)	200(100)
<i>Physical</i>	172(86.0)	28(14.0)	0(0.0)	200(100)
<i>PMS</i>	124(62.0)	72(36.0)	4(2.0)	200(100)

Table 2: The frequency and severity of mood behavioral Physical signs and symptoms

	<i>Mild N (%)</i>	<i>Moderate N (%)</i>	<i>Severe N (%)</i>	<i>Total N (%)</i>
<i>Mood signs and symptoms</i>				
Irritability	82(41.0)	69(34.5)	49(24.5)	200(100.0)
Nervousness-loosing temper	89(44.5)	71(35.5)	38(19.0)	198(99.0)
Anxiety	28(14.0)	97(48.5)	70(35.0)	195(97.5)
Depression-sadness	27(13.5)	117(58.5)	56(28.0)	200(100.0)
Crying without any reason	140(70)	29(14.5)	1(0.5)	170(85)
Loneliness-aloof seeking	97(48.50)	75(37.5)	18(9.0)	190(95)
<i>Behavioral signs and symptoms</i>				
Fatigue –Lack of energy	71(35.5)	85(42.5)	41(20.5)	197(98.5)
Insomnia	123(61.5)	48(24.0)	1(0.5)	172(86.0)
Sexual behavioral changes	110(55.0)	7(3.5)	6(3.0)	123(61.5)
Concentration difficulties	103(51.5)	70(35)	22(11.0)	195(97.5)
Polyphasia	69(34.5)	93(46.5)	37(18.5)	199(99.5)
<i>Physical signs and symptoms</i>				
Headache	129(64.5)	39(19.5)	12(6.0)	180(90.0)
Breast tenderness	107(53.5)	66(33.0)	12(6.0)	185(92.5)
Low back pain	110(55.0)	38(19.0)	22(11.0)	170(85.0)
Supra pubic pain	134(67.0)	44(22.0)	6(3.0)	184(92.0)
Myalgia - Arthralgia	118(59.0)	38(19)	11(5.5)	167(83.5)
Getting weight	113(56.5)	19(9.5)	8(4.0)	140(70.0)
Nausea-Diarrhea-Constipation	132(66.0)	36(18.0)	6(3.0)	174(87.0)
Edema	112(56.0)	13(6.5)	0(0.0)	125(62.5)

There was a positive statistical significant correlation between severity of physical and behavioral signs (P=0.00, r=0.55) and mood and behavioral signs (P=0.00, r=0.398). Physical and mood signs also showed a positive statistical significant correlation (P=0.00, r=0.305). On the other hand, polyphagia which was seen among 99.5% objects with PMS, had a positive significant correlation with depression (P=0.001, r=0.296), concentration difficulties (P=0.00, r=0.236), and fatigue / lack of energy (P=0.00, r=0.359).

Discussion:

PMS prevalence has been reported variously (Rasheed and Al Sowielem, 2003; Derman *et al.*, 2004; Demicheli *et al.*, 2002; Steinner *et al.*, 2003). Up to 30% of the women of reproductive age experience its' symptoms at some degree (Berslin and LUCAS, 2003). In our study, from 255 of 500 completed forms, 200 (78.43%) reported different degrees of PMS. Other studies also have reported PMS prevalence from 61.4% to 96.6 % (Rasheed and Al Sowielem, 2003; Derman *et al.*, 2004; Demicheli *et al.*, 2002; Steinner *et al.*, 2003). These various differences can be the result of various age groups under study and different believes and knowledge and attitudes toward PMS.

In our study only 4 subjects (2%) were suffering from sever PMS. Range of reported severity in other

studies is between 3% and 13.4% (Derman *et al.*, 2004; Demicheli *et al.*, 2002). Our data support Tamjidi study (1995) in Tehran which reported the prevalence of severity up to 3%. This similarity can be due to the fact that in both studies the target populations are from Tehran (Tamjid, 1995).

According to our findings none of the participants had severe physical signs. Although 24 of them (12%) were suffering from severe mood signs and 3 of them (1.5%) were suffering from behavioral signs. In our research 100% of participants who had PMS were complaining of irritability, depression or sadness during this phase. This is consistent with Baluch study result (ref). He reported irritability, depression and worries as the most common mood symptoms of PMS. While Derman *et al.* introduced stress and sadness as the most common symptoms. The most of the students (99.5%) in this phase were complaining of increased appetite and polyphagia and 99% reported losing temper. According to Hatch and Goldman (2000), 70% of sample population was complaining of polyphagia and 80% experienced anger. Blundell and Dye reported polyphagia and fatigue as the most common symptoms (Dye and Blundell, 1997).

Other signs and symptoms which were reported commonly and at least 90% of students were suffering from them were as follow: fatigue (98.5%), anxiety and concentration difficulties (97.5%), loneliness (95%), breast tenderness (92.5%), lower abdominal pain (92%) and headache (90%). Some researches reported anxiety and stress (87.6%), lower abdominal pain (70.5%), fatigue (69.5%), and breast tenderness (37.1) (Derman *et al.*, 2004) but other some showed sadness and nervousness (81%), crying without any reason (65%) loneliness and aloof seeking (47%), confusion and concentration difficulties (13%). (Mortola, 2000)

In our study, both of physical and mood signs and symptoms had significant positive correlation ($p=0.00$) with behavioral signs ($r=0.398$ and $r=0.55$, respectively). We also found a positive significant correlation between physical and mood signs ($p=0.00$, $r=0.305$). It may be concluded that women's physical or mood problems can affect their behavior, which will be followed by negative mood or behavioral changes. Finally, during PMS cycle some changes will occur in women's behavior which can affect person's mood.

Rasgon *et al.*, (2000) and Benton (2002) have shown the role of neurotransmitters such as serotonin in some mood and behavioral changes such as depression, appetite, sexual desire, sleep disorders and so on. They claimed that serotonin has some influence on behavior and mood characteristics and any disorder in synthesis of this neurotransmitter may lead to other disorders by itself such as depression, aggressiveness, dysphoria, sleep disorders and polyphagia (Rasgon *et al.*, 2000; Benton, 2002). According to what they found, serum serotonin level during luteal phase is very low among those women who are suffering from PMS. On the other hand, during premenstrual period, insulin hypersensitivity can result in hypoglycemia after intake oral glucose. These conditions can result in many physical, behavioral and mood problems during this period of time (Havens *et al.*, 1991).

Our findings showed a positive significant correlation between polyphagia and depression ($p=0.001$, $r=0.296$), concentration difficulties ($p=0.001$, $r=0.296$), and fatigue ($p=0.001$, $r=0.359$). It seems that both signs of polyphagia and depression are coexistent. Some researches have shown a direct relation between severity of depression and appetite during premenstruation period and suggested serotonin as an important causing factor (Dye and Blundell, 1997). There is some evidence that higher calorie intake may improve anger, depression and concentration difficulties. Blood glucose is the only energy source for neurons and when hypoglycemia occur; the neurons function face the some disorders such as vertigo and concentration problems (Sayegh *et al.*, 1995; Benton, 2002).

According to Blundell and Dye findings, among the women who are suffering from PMS, calorie intake and increased appetite during premenstruation period is higher than any other period and this increased appetite will be higher if depression occurs to compensate the serotonin decline level in the brain (Alexander *et al.*, 2000). Therefore it could be concluded that polyphagia is a compensatory mechanism to increase the brain's serotonin level, as well as preventing the hypoglycemia.

Conclusion:

Our data show that PMS is one of the most common problems which many women suffer during their reproductive age. All of our participants who had PMS were complaining of symptoms of irritability, depression or sorrow and sadness. Increased appetite and polyphagia, nervousness, fatigue, anxiety and concentration difficulties, loneliness, breast tenderness, lower abdominal pain, and headache were also serious problems for most.

Our findings also confirm a significant positive relationship between both of physical and mood signs and symptoms with behavioral signs and also a positive significant correlation between physical and mood signs and symptoms.

These findings show mood and behavioral disorders are common between women affected with PMS.

Therefore, Health professionals should pay more attention to mood and behavioral as well as physical symptoms and signs in women with PMS and provide them with an appropriate consultation or medical intervention if necessary. Additional studies with higher sample size ,....in this field are warranted.

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