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Original contribution

The premenstrual symptoms screening tool (PSST) for clinicians

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Summary

A variety of instruments have been used in an attempt to operationalize DSM-IV criteria for premenstrual dysphoric disorder (PMDD) and to understand clinically significant premenstrual syndrome (PMS). The objectives of this research were to devise a simple user friendly screening tool to identify women who suffer from severe PMS/PMDD and who are likely to benefit from treatment. Five hundred and nineteen women, between the ages of 18 and 55 yrs, who were seen at a primary care facility completed ''The Premenstrual Symptoms Screening tool'' (PSST). The PSST reflects and 'translates' categorical DSM-IV criteria into a rating scale with degrees of severity. The results are in line with reported prevalence rates from several recent large prospective studies. We believe that the PSST applies a necessary degree of measure of severity and impact of premenstrual symptoms, establishes quickly if women qualify for PMDD, and is less time consuming and more practical than two cycles of prospective charting. This fast simple tool is an effective screening tool and an important starting point for further assessment.

Keywords: Premenstrual syndrome (PMS); premenstrual dysphoric disorder (PMDD); screening instrument.

Introduction

Epidemiologic surveys have estimated that as many as 80% of women of reproductive age experience some symptoms attributed to the premenstrual phase of the menstrual cycle (Johnson et al., 1988; Hylan et al., 1999). The ICD-10 diagnosis of Premenstrual Syndrome (PMS) requires only one premenstrual symptom in a list of symptoms which includes mild psychological discomfort, feelings of bloating and weight gain, breast tenderness, swelling of hands and feet, various aches and pains, poor concentration, sleep disturbance and change in appetite (WHO 1996). The PMS definition lacks definitive criteria for symptom severity and symptom duration nor is there a requirement to establish the impact or the burden of these symptoms.

More stringent criteria are required for a diagnosis of Premenstrual Dysphoric Disorder (PMDD), the most severe form of PMS. PMDD diagnostic criteria found in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (APA 1994) specify that at least five of eleven mood, behavioural or physical symptoms must be present and at least one must be from the four core symptoms:

1) markedly depressed mood, feelings of hopelessness, or self-deprecating thoughts
2) marked anxiety, tension, feelings of being ''keyed up'' or ''on edge''
3) marked affective lability (e.g., feeling suddenly sad or tearful or increased sensitivity to rejection)
4) persistent and marked anger or irritability or increased interpersonal conflicts. The symptoms must markedly interfere with work or school or with usual social activities and relationships with others (e.g., avoidance of social activities, decreased productivity and efficiency at work or school). The presence of the cyclical pattern of symptoms must be confirmed by prospective daily symptom ratings for a minimum of two consecutive symptomatic cycles, and must be present for most months during the previous year (Table 1).

The DSM-IV diagnostic criteria for PMDD however do not measure the degree or severity of the premenstrual symptoms nor is the absence/presence of symptoms

Table 1. Summary of PMDD Criteria*

A. Symptoms must occur during the week before menses and remit a few days after onset of menses.
Five of the following symptoms must be present and at least one must be (1), (2), (3), or (4).

1. Depressed mood or dysphoria
2. Anxiety or tension
3. Affective lability
4. Irritability
5. Decreased interest in usual activities
6. Concentration difficulties
7. Marked lack of energy
8. Marked change in appetite, overeating, or food cravings
9. Hypersomnia or insomnia
10. Feeling overwhelmed
11. Other physical symptoms i.e. breast tenderness, bloating

B. Symptoms must interfere with work, school, usual activities or relationships
C. Symptoms must not merely be an exacerbation of another disorder
D. Criteria A, B, and C must be confirmed by prospective daily ratings for at least two consecutive symptomatic menstrual cycles

* Modified DSM-IV criteria.

over and above the required number of symptoms of relevance. The clinician is called upon to make a categorical judgement, presumably based on a clinical interview, as to whether a subject meets the diagnostic criteria for PMDD or not. At the end of this first interview only a tentative diagnosis of PMDD can be established. It is the prospective daily charting which has to be completed over a period of two consecutive symptomatic cycles (Criterion D) which is used to confirm the diagnosis and is the only measure of severity as well as of change over time. There are at least 5 different diaries that have been used in recent years and there is no consensus as to which one is the preferred (Reid, 1985; Mortola et al., 1990; Endicott and Harrison, 1992; Freeman et al., 1996; Steiner et al., 1999.) Prospective daily charting has been used primarily in PMS/PMDD randomized clinical trials (Sundblad et al., 1993; Steiner et al., 1995; Yonkers et al., 1997; Wikander et al., 1998; Freeman et al., 1999; Pearlstein et al., 2000; Dimmock et al., 2000; Halbreich et al., 2002; Cohen et al., 2002).

DSM-IV criteria attempt to address the distinctiveness of PMDD as an entity separate from other psychiatric disorders, medical disorders or the more loosely defined PMS. However, comprehensive data about the prevalence of PMDD and mild, moderate or severe PMS in the community is limited because of a lack of consensus in study criteria and design. Existing studies differ in their interpretation of DSM-IV criteria, and definitions of clinically significant premenstrual symptoms are not comparable (Ramcharan et al., 1992; Gehlert and Hartlage, 1997; Deuster et al., 1999; Hylan et al., 1999; Angst et al., 2001; Wittchen et al., 2002; Sternfeld et al., 2002).

Although the above mentioned studies were designed with some rigor to assess PMDD, substantial differences exist in the measurement tools used, and in the study structure (retrospective, prospective, cross sectional). This clearly signifies the difficulty in trying to operationalize criteria for PMDD and in trying to understand clinically significant PMS. The objective of our research was to devise a simple user friendly tool which will help identify women who meet DSM-IV criteria for PMDD as well as women who experience 'clinically significant' PMS but do not qualify for the diagnosis of PMDD. Based on our experience of the reluctance on the part of patients and health care providers to initiate treatment only after two cycles of prospective daily symptom, we developed a screening tool, 'The Premenstrual Symptoms Screening Tool (PSST) (Appendix 1). The PSST includes a list of premenstrual symptoms as well as a measure of impairment in accordance with DSM-IV criteria for PMDD. It also 'translates' categorical DSM-IV criteria into a rating scale with degrees of severity. It has been suggested that the subjective reporting of severity of symptoms may be the most useful clinical diagnostic indicator of women seeking treatment (Angst et al., 2001) and captures the greatest number of symptomatic women (Smith et al., 2003). We used the instrument as a screening tool to identify women who suffer from severe PMS/PMDD and who are likely to benefit from treatment.

Methods

The study was conducted from 1999 to 2001 and was coordinated by research staff from a university affiliated women's clinic in a moderately sized city in southern Ontario, Canada. Women in their reproductive years who were over 18 years old, able to provide written informed consent and who had regular menstrual cycles were invited to complete the PSST. The premenstrual symptoms and impairment criteria listed on the questionnaire are in accordance with DSM-IV criteria for PMDD. Women are asked "Do you experience some or any of the following premenstrual symptoms which *start before* your period and *stop* within a few days of bleeding?" The symptoms listed are depressed mood/hopelessness, anxiety/tension, tearful/increased sensitivity to rejection, anger/irritability, decreased interest in work activities, decreased interest in home activities, decreased interest in social activities, difficulty concentrating fatigue/lack of energy, overeating/food craving, insomnia, hypersomnia, feeling overwhelmed or out of control, and physical symptoms. In order to capture the DSM-IV criteria of impairment at work, at school, in usual social activities and in relationships with others, (burden of illness), women are asked "Have your symptoms as listed above, interfered with:" any of the following five domains: work efficiency or productivity, relationships with

coworkers, relationships with your family, social life activities and/or home responsibilities. Whereas the DSM-IV criteria does not specify degree of severity, we asked women to rate their experience of symptoms as well as impairment as 'not at all', 'mild', 'moderate' or 'severe'. We also collected additional demographic information on these women including: age; number of children; hormonal contraception; onset, regularity, duration of cycle; pain with periods; number of days that premenstrual symptoms last; and number of years with premenstrual symptoms. The PSST was piloted at a primary care facility which employs several family physicians and nurse practitioners. Over a period of a few months, women who were at the facility for their annual influenza vaccine were recruited at random and asked to complete the questionnaire.

Results

Five hundred and nineteen women between the ages of eighteen and fifty-five years completed the PSST. Eleven were dropped from analysis because of incomplete data. This left 508 on whom analysis was conducted.

Three groups of women were identified using SAS analysis. The first group consisted of twenty six women (5.1%) who met DSM-IV criteria for the diagnosis of PMDD. In order to meet these criteria, women had to report at least one of the four core symptoms (irritability, dysphoria, tension, lability of mood) as *severe* and at least 4 additional symptoms (for a total of 5) as *moderate to severe.* They also had to report that their 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). We identified this group as '*PMDD*'.

In the second group, one hundred and five women (20.7%) marginally missed DSM-IV criteria for the diagnosis of PMDD. These women reported at least one of the four core symptoms as *moderate to severe* and at least four additional symptoms as *moderate to severe*. They also reported that their symptoms interfered *moderately to severely* with their ability to function in activities of daily living in at least one of the five psychosocial domains listed above. We identified this group as '*MODERATE TO SEVERE PMS*'.

The third group consisted of the rest of the women (N = 377 women, [65%]) who experienced '*NO/MILD PMS*'.

Approximately one third of the women in the survey were on hormonal contraceptives (HC). The rates of '*PMDD*' were similar between women on and those not on HC. Of those women using HC, 5.9% were classified as '*PMDD*' and 26.0% marginally missed the DSM-IV criteria for the diagnosis of PMDD and were classified as '*MODERATE TO SEVERE PMS*'. In women not using HC, the comparable rates were 4.8% and 25.6%.

Continuous variables were analyzed by analysis of variance and categorical variables were analyzed by Fisher's exact test. The '*NO/MILD PMS*' group had statistically significant fewer days of menstrual bleeding compared to the '*PMDD*' group ($p = .007$) and more women in this group had regular periods when compared to the '*MODERATE TO SEVERE PMS*' group ($p = .021$). The '*NO/MILD PMS*' group also had a statistically significant fewer number of premenstrual symptom days than either of the other two groups (Table 2).

There was a statistically significant difference among all three groups with respect to menstrual cramps: the '*PMDD*' group reported more pain than the '*MODERATE TO SEVERE PMS*' group ($p = .040$) and the '*NO/MILD PMS*' group ($p < .001$); and the '*MODERATE TO SEVERE PMS*' group experienced more pain than the '*NO/MILD PMS*' group ($p = .022$). Overall, 92.0% of women in the '*PMDD*' group, 72.4% of women in the '*MODERATE TO SEVERE PMS*' group and 59.7% of women in the '*NO/MILD PMS*' group reported pain associated with their periods. (Table 3).

Table 2. Demographics

	No/Mild PMS			*Moderate to Severe PMS*			*PMDD*		
	N	Mean	Standard deviation	N	Mean	Standard deviation	N	Mean	Standard deviation
Age	360	34.63	8.72	100	35.39	8.76	22	33.23	7.71
Age period started	375	12.89	1.49	104	12.67	1.54	25	12.44	1.23
Length of cycle	353	28.11	2.66	98	27.58	2.68	25	28.16	2.95
How many days bleeding lasts*	374	5.04	1.44	103	5.28	1.80	26	5.88	1.97
Number of children	377	1.31	1.17	105	1.45	1.26	26	1.35	1.02
Number days premenstrual symptoms last**	270	3.57	2.56	96	5.64	3.08	23	6.70	3.02
Number years with premenstrual symptoms	301	11.49	8.12	92	12.32	8.31	23	11.00	5.36

* $p = 0.007$: No/Mild PMS vs. PMDD.
** $p < 0.001$: No/Mild PMS vs. Moderate to Severe PMS and No/Mild PMS vs. PMDD.

Table 3. Demographics

	No/Mild PMS	*Moderate to Severe PMS*	*PMDD*
Regular period*	295/365 = 80.8%	72/103 = 69.9%	18/26 = 69.2%
Menstrual cramps**	222/372 = 59.7%	76/105 = 72.4%	23/25 = 92.0%
Hormonal contraception	125/375 = 33.3%	34/104 = 32.7%	10/26 = 38.5%
Timing of symptoms			
Start of period	141/284 = 49.7%	36/78 = 46.2%	13/21 = 61.9%
After childbirth***	60/229 = 26.2%	39/75 = 52.0%	9/17 = 52.9%
After starting BC pill	29/228 = 12.7%	8/58 = 13.8%	2/16 = 12.5%
After stopping BC pill	41/224 = 18.3%	11/57 = 19.3%	2/15 = 13.3%

* $p = 0.021$: No/Mild PMS vs. Moderate to Severe PMS.
** $p = 0.022$: No/Mild PMS vs. Moderate to Severe PMS; $p < 0.001$: No/Mild PMS vs. PMDD; $p = 0.040$: Moderate to Severe PMS vs. PMDD.
*** $p < 0.001$: No/Mild PMS vs. Moderate to Severe PMS; $p = 0.025$: No/Mild PMS vs. PMDD.

Statistically significantly more women in the '*MODERATE TO SEVERE PMS*' and the '*PMDD*' groups reported that their symptoms started after childbirth ('*NO/MILD PMS*' vs.'*MODERATE TO SEVERE PMS*' [$p < .001$]; '*NO/MILD PMS*' vs '*PMDD*' [$p = .025$]. There was no statistical significance between any of the groups who reported the onset of symptoms when they first began to have periods (Table 3).

Symptoms were categorized as present if the women responded ''moderate'' or ''severe'' and not present if they responded ''not at all'' or ''mild''. All individual symptoms were reported more frequently in the women with either '*MODERATE TO SEVERE PMS*' or '*PMDD*' compared to those with '*NO/MILD PMS*' and more frequently in the women with '*PMDD*' compared to those with '*MODERATE TO SEVERE PMS*'. However, more than two thirds of the women with '*MODERATE TO SEVERE PMS*' reported anger/irritability (91.4%), physical symptoms (84.8%), fatigue/lack of energy (84.5%), tearfulness (77.0%), anxiety/tension (76.0%), depressed mood (71.6%) and overeating (66.7%), and more than half reported feeling overwhelmed (63.8%), decreased interest in work (54.1%) and decreased interest in home (51.0%) (Table 4).

Table 4. Proportion of patients with either moderate or severe symptoms

Group	*No/Mild PMS*	*Moderate to Severe PMS*	*PMDD*
Depressed mood	11.3%	71.6%	96.2%
Anxiety/tension	18.2%	76.0%	96.2%
Tearful	23.2%	77.0%	91.7%
Anger/irritability	30.0%	91.4%	96.2%
Decreased interest in work	5.6%	54.1%	57.7%
Decreased interest in home	6.4%	51.0%	69.2%
Decreased interest in social	5.1%	48.5%	65.4%
Difficulty concentrating	4.6%	44.6%	69.2%
Fatigue/lack of energy	24.9%	84.5%	92.3%
Overeating	24.5%	66.7%	73.1%
Insomnia	5.1%	29.7%	52.0%
Hypersomnia	14.3%	48.0%	62.5%
Feeling overwhelmed	9.5%	63.8%	96.0%
Physical symptoms	38.0%	84.8%	88.5%

Symptoms are considered present if answered as ''moderate'' or ''Severe'' and not present if answered ''not at all'' or ''Mild''.

Discussion

The PSST reflects DSM-IV criteria and 'translates' categorical DSM-IV criteria into a rating scale with degrees of severity. The results are in line with several recent prospective studies which report a prevalence of PMDD in a range of 4.6 to 8.1% and a prevalence of severe PMS in a range of 12.6% to 31.0% (Gehlert and Hartlage, 1997; Hylan et al., 1999; Angst et al., 2001; Wittchen et al., 2002; Sternfeld et al., 2002).

The burden of illness of PMDD is inherent in the diagnosis; the premenstrual cluster of emotional and behavioural symptoms are so disruptive that they affect a woman's functioning in the home, in social situations and at work. Women who meet criteria for PMDD usually require pharmacologic treatment, specifically selective serotonin reuptake inhibitors (SSRIs) in order to effectively manage their symptoms and the impact on activities of daily living (Dimmock et al., 2000; Steiner, 2000).

The burden of illness for women with a diagnosis of PMS is less clear because of the considerable variation in the number, duration and severity of symptoms. Data regarding the extent of clinically significant symptoms and the degree of psychosocial and functional impairment in this population is lacking. Women may

experience only one premenstrual symptom but find that it severely interferes with their quality of life; others may report several symptoms but with only minimal to mild impact. In our study, we found that a high proportion (20.7%) of women did not qualify for the very strict DSM-IV research diagnostic criteria for PMDD yet more than half of these women reported anger/irritability, physical symptoms, fatigue/lack of energy, tearfulness, anxiety/tension, depressed mood, feeling overwhelmed and decreased interest in work and in home. Women who do not meet PMDD criteria are generally encouraged to try conservative treatments and non-pharmacologic management (Steiner, 2000). These measures are likely to be ineffective for the large subgroup of women who marginally miss meeting PMDD diagnostic criteria yet experience significant functional impairment. The potential magnitude of premenstrual impairment in occupational settings, (i.e. absences from work), reduced productivity as well as with lifestyle and relationships can be profound. It has also been reported that premenstrual impairment resulted in difficulty with completing home-based tasks and/or discord in family relationships (Hylan et al., 1999). Several studies have shown that levels of impairment in social and leisure activities, as well as marital and other family relationships, in women with PMDD are similar to that of major depressive disorder (Yonkers et al., 1997; Pearlstein et al., 2000).

The burden of illness of depression in the workplace has been well documented; findings suggest elevated rates of chronic disability, lost work days and diminished work performance in this population (Greenberg and Birnbaum, 2000; Pearlstein et al., 2000; Macdougall and Steiner, 2003). The finding of similar rates of PMDD between women on and those not on hormonal contraceptives is in line with data which suggest that HC may reduce premenstrual physical symptoms but do not effect a statistically significant reduction in psychological symptoms (Backstrom et al., 1992; Graham and Sherwin, 1992; Freeman et al., 2001). Therefore, for women on HC the core mood symptom criteria for the diagnosis of PMDD are unchanged. A high proportion of women with '*PMDD*' (88.5%) and '*MODERATE TO SEVERE PMS*' (84.8%) reported moderate to severe physical symptoms compared to only 38.0% of women in the '*NO/MILD PMS*' group. DSM-IV criteria for PMDD highlights premenstrual mood symptoms yet our data clearly show a very high percentage of women with either '*PMDD*' or '*MODERATE TO SEVERE PMS*' who experience significant physical symptoms. Physical symptoms may play a larger role in the burden of illness of PMDD than originally thought.

This study had a number of limitations. We are aware that accurate diagnoses were not possible as the data was not collected prospectively over time and patients were not interviewed by a clinician. As well, there was no means of determining if there was a premenstrual exacerbation/magnification of an underlying psychiatric or medical illness. We also did not differentiate between women who had '*NO PMS*' vs '*MILD PMS*'.

Nevertheless, The Premenstrual Symptoms Screening Tool with the simple 4-point rating (not at all, mild, moderate, severe) applies a necessary degree of measure of severity and impact of premenstrual symptoms. As such, it establishes quickly if women qualify for PMDD and is less time consuming and more practical than two cycles of prospective charting which may be a deterrent for seeking help. This fast, simple tool is an effective screening tool and an important starting point for further assessment. Following screening, the clinician still must rule out other psychiatric and medical conditions and if in doubt, more comprehensive assessment measures including prospective charting should be initiated.

The 'Premenstrual Symptoms Screening Tool' will need to be further validated against the current ''golden standard'' of prospective daily charting.

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Appendix 1

The premenstrual symptoms screening tool (PSST)

(please mark an "X" in the appropriate box)

Do you experience some or any of the following premenstrual symptoms which *start before* your period and *stop* within a few days of bleeding?

Symptom	Not at all	Mild	Moderate	Severe
1. Anger/irritability				
2. Anxiety/tension				
3. Tearful/Increased sensitivity to rejection				
4. Depressed mood/hopelessness				
5. Decreased interest in work activities				
6. Decreased interest in home activities				
7. Decreased interest in social activities				
8. Difficulty concentrating				
9. Fatigue/lack of energy				
10. Overeating/food cravings				
11. Insomnia				
12. Hypersomnia (needing more sleep)				
13. Feeling overwhelmed or out of control				
14. Physical symptoms: breast tenderness, headaches, joint/muscle pain, bloating, weight gain				

Have your symptoms, as listed above, interfered with:

	Not at all	Mild	Moderate	Severe
A. Your work efficiency or productivity				
B. Your relationships with coworkers				
C. Your relationships with your family				
D. Your social life activities				
E. Your home responsibilities				

Scoring

The following criteria must be present for a diagnosis of **PMDD**

1) at least one of #1, #2, #3, #4 is **severe**
2) in addition at least four of #1 – #14 are **moderate to severe**
3) at least one of A, B, C, D, E is **severe**

The following criteria must be present for a diagnosis of **moderate to severe PMS**

1) at least one of #1, #2, #3, #4 is **moderate to severe**
2) in addition at least four of #1 – #14 are **moderate to severe**
3) at least one of A, B, C, D, E is **moderate to severe**