Mood Disorder History and Personality Assessment in Premenstrual Dysphoric Disorder

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Background: Menstrually related dysphoria is known to be associated with other affective disorders, notably major depressive disorder and puerperal depression. The relationship between premenstrual dysphoric disorder (PMDD) and maladaptive personality disorders and traits, however, is less established, at least in part because of the methodological and nosologic difficulties in the diagnosis of both PMDD and personality disorders. This study seeks to address this problem to elucidate the relationship between PMDD, other affective disturbances commonly experienced by women, and maladaptive personality.

Method: Axis I and II disorders were examined using standardized instruments and stringent diagnostic criteria (DSM-IV and the International Personality Disorders Examination) in 34 women with DSM-IV PMDD and 22 healthy women without severe premenstrual mood changes.

Results: Seventy-seven percent of the PMDD group had suffered from a past Axis I disorder in comparison with 17% of the control group. Two thirds of the parous women with PMDD had suffered from major depressive disorder in the puerperium. Personality disorder diagnoses were not highly represented in either group of women. The women with PMDD had significantly more obsessional personality traits ($p < .001$) but not absolute personality disorder diagnoses.

Conclusion: Obsessional symptoms are known to cluster with the affective disorders and may reflect underlying temperamental and biological vulnerability. This study provides further evidence of the link between serotonergic dysregulation, personality vulnerability, and mood changes related to the female reproductive cycle.

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It is now known that premenstrual dysphoric disorder (PMDD)[1] is closely linked to the affective disorders. The evidence for this association comes from a variety of sources. From a theoretical point of view, it is known that depressive disorder and PMDD share a biological substrate in that both are aggravated by acute tryptophan depletion,[2] both share neuroendocrine markers of reduced serotonergic function as a trait marker,[3] and both respond to selective serotonin reuptake inhibitors (SSRIs).[4,5] Rubinow et al.[6] go so far as to describe estrogen/gonadotropin-serotonin interactions as the likely origin of PMDD. Further evidence for an association between these disorders comes from prevalence studies using lifetime historical data. It has been shown that upwards of 70% of women with late luteal phase dysphoric disorder (LLPDD),[7] the DSM-III-R category for clinically significant premenstrual mood change, have suffered a past major depressive episode.[8] It is noted that patients with PMDD have increased past episodes of mood disorder and a family history of mood disorder.[9]

The relationship between depression and PMDD, however, is unlikely to be completely straightforward. In the longitudinal twin study conducted by Kendler et al.,[10] it was found that environmental and genetic factors for premenstrual syndrome (PMS) were only weakly related to depressive disorder. Unlike in depressive disorder, treatment response to SSRIs in PMDD is rapid, allowing intermittent dosing to be effective.[11] Therefore, it would appear unlikely that the biological or neurotransmitter basis of the 2 disorders is completely the same or that they are expressions of the same underlying defect, although serotonergic neurotransmission seems strongly implicated in both.

The evolution of PMDD and its relationship to affective disorder can be investigated using prospective studies. Roca et al.[12] followed up 27 women with PMS at 5 and 12 years, retrospectively applying diagnostic criteria since the PMDD diagnosis was not available when their study began. Fifty-two percent of the PMDD patients and none of the controls had a history of depression prior to entering the study. Unlike Wetzel et al.,[13] who did find a higher than expected proportion of new depression cases in college students with PMS, Roca et al.[12] did not find a higher inception of depression when the presence of depression in the past history was controlled for. Therefore,

in the group studied by Roca et al., all the new cases of depression were accounted for by the attendant risk of having suffered depression at baseline rather than PMDD diagnosis. The PMDD symptoms and diagnosis showed nosologic stability over time in this small sample.

De Ronchi et al.[14] have also examined the association of LLPDD and depressive disorder**.** They administered the Structured Clinical Interview for DSM-IV (SCID)[15] to 43 LLPDD subjects and 85 controls, using the effect size method for diagnosis of PMDD (mean severity in the late luteal phase exceeding severity in the follicular phase by at least 1 standard deviation). There was a 9-fold risk of suffering from LLPDD (odds ratio = 9.23) for those with mild or moderate depression as determined by the Montgomery-Asberg Depression Rating Scale.[16] Older women (over 30 years of age) with the disorder were more likely to have avoidant personality disorder than controls, but no significant personality disorder diagnoses were found in younger women.

Overall, personality dysfunction as a correlate of PMDD has received less attention than the correlation of PMDD with affective disorders. The prevalence of both Axis I and Axis II disorders in women with premenstrual problems has been investigated by Pearlstein et al.[17] In their study of 78 patients with LLPDD, 78% had a lifetime history of any Axis I disorder, notably major depressive disorder and depression of the puerperium, and only 10% had had an Axis II diagnosis, which is similar to average population estimates.[18] The personality disorder diagnoses found in this group were avoidant, paranoid, and obsessive-compulsive. Eckert et al.[19] found high levels of personality dysfunction in women with premenstrual symptoms but no association between personality disorder diagnosis per se and PMS or LLPDD diagnosis. They found, however, a correlation between personality disorder diagnosis and severity of symptoms.

Maladaptive personality traits may also have an impact on the reliability of retrospective data. Taylor et al.[20] found that a retrospective checklist, alongside a measure of neuroticism versus stability, identified more premenstrual changes than a daily nonspecific health record in neurotic women and drew attention to response bias in any past study that had used retrospective checklists. High levels of neuroticism were found by Bancroft et al.[21] as well as past history of depressive disorder. These findings may fit into the overall picture of an underlying depressive personality profile for women who have PMDD. Parry et al.[22] found increased Minnesota Multiphase Personality Inventory scores for cyclothymia, depression, and hypomania and for passive-aggressive traits among women with LLPDD. It is possible therefore that despite difficulties in reporting, an underlying personality trait underpins vulnerability for the 2 disorders, perhaps again reflecting the purported psychopharmacologic substrate of serotonergic dysfunction.

Past investigations into PMDD have suffered from lack of clarity regarding classification and measurement of symptoms. This study was designed to investigate past mood disorders and personality morbidity in women with PMDD without the limitations that could render results misleading. Methodology was used to increase nosologic precision, thereby obtaining a pure PMDD sample. Confounding effects were further minimized by use of a control group selected by the same methods and careful distinction between cyclical and enduring symptomatology.

METHOD

Recruitment

An advertisement was put into a newspaper covering most of south London asking for volunteers who suffered from severe premenstrual symptoms and also for healthy volunteers. Overall, 158 women replied to the advertisement. Of these, after telephone screening for exclusions, 88 women were given appointments. The main reason for noninclusion was use of oral contraceptive; others reported enduring psychiatric or gynecologic problems or were taking other kinds of medication. Twenty-seven women failed to attend for assessment despite 2 prompting appointments. A similar proportion of women who said they suffered from severe premenstrual symptoms and healthy women failed to attend their appointment. The study was approved by the institutional ethics committee (Institute of Psychiatry, Kings College London, London, U.K.), and all participants gave written informed consent prior to their inclusion.

Diagnosis of PMDD

All women included were rated using the DSM-IV criteria for PMDD.[1] This diagnosis requires a list of symptomatology in most menstrual cycles over the previous year; symptoms must cause significant social upheaval and must be assessed prospectively. Participants rated their symptoms on a visual analogue scale 1 page per day for at least 3 menstrual cycles. The method of applying daily ratings and criteria for change has varied between authors. Rubinow et al.[23] have found visual analogue scales (VAS) to be an effective method of confirming menstrual cycle–related mood change. Yonkers et al.[5] used a criterion of premenstrual worsening by at least 75% in a minimum of 5 scores in their Daily Record of Severity of Problems, which scores each symptom on a 6-point scale from absent (0) to severe (6). Freeman et al.[24] have used a 5-point scale for 17 common symptoms of PMDD and applied a criterion of 50% increase in total average score between premenstrual and follicular phases. Steiner et al.[25,26] have used a combination of the Premenstrual Tension Syndrome Observer (PMTS-O) and Self-Rating (PMTS-SR) scales with visual analogue symptom scales and again found general agreement between the scales and sensitivity to premenstrual mood deterioration.

The daily rating scale in the present study allowed symptom ratings from no symptoms at all (0 mm) to most severe (100 mm) for 19 common premenstrual symptoms, notably related to dysphoria, irritability, and anxiety. For a diagnosis of PMDD, the mean premenstrual symptom score in the 5 days premenses for the 5 most severe symptoms must exceed follicular phase scores by at least 50%. All subjects included in the study had low daily rating scores during the follicular phase and large increases in symptomatology in the late luteal phase exceeding this criterion, consistent with a "pure" PMDD diagnosis. A visual analogue scale rather than a point scale on separate sheets was used to minimize the chance of stereotyped answers. Subjects who obviously did not cycle in their symptomatology, as evidenced by either chronicity of symptoms or lack of symptoms, were excluded. The PMTS-SR and PMTS-O were also used to assess symptom severity.[25]

Subjects

All subjects in the PMDD group met the above criteria for diagnosis. Subjects in the control group were free of significant premenstrual symptoms. At screening interview, the following were excluded from the study: women who did not report severe cyclical symptoms; those who were receiving medication, including oral contraception; those suffering from significant medical illness or psychiatric disorder; those planning to become pregnant during the time of the study; those with irregular menstrual cycles; and those taking excess alcohol or taking illicit substances. Only 5 women were excluded from the study after full examination of their Axis I and II disorders: 4 met full criteria for current major depressive disorder, and 1 met criteria for dysthymia. Three women who initially presented themselves as suffering from premenstrual symptoms failed to meet severity and variability criteria and were included as controls.

Measures of Other Axis I and II Disorders

The SCID[15] was administered to all participants. This interview examined lifelong mood disorders, psychotic symptoms, substance misuse, anxiety, and other disorders.

Personality was assessed using the International Personality Disorders Examination (IPDE).[18,27] The IPDE was developed by the World Health Organization to standardize the diagnostic assessment of personality in clinical research and has been widely evaluated in field trials across the world. It has been found to demonstrate satisfactory interrater reliability and temporal stability, although, like all personality disorder assessments, the validity is unknown against an acceptable gold standard.[27] It is satisfactory for use without an informant but may be biased by overwhelming Axis I symptoms. Therefore, IPDE assessments were made during the follicular phase.

Table 1. Characteristics of the Premenstrual Dysphoric Disorder (PMDD) and Control Groups[a]

	PMDD (N = 34)		Control (N = 22)	
Characteristic	Mean	SD	Mean	SD
Age, y	35.0	6.0	32.2	5.8
Mean symptom duration, y	11.3	5.5	...	...
Late luteal PMTS-O score	24.2*	6.4	7.1	5.5
Late luteal PMTS-SR score	23.1*	4.2	6.1	8.5

[a]Abbreviations: PMTS-O = Premenstrual Tension Syndrome Observer Scale, PMTS-SR = Premenstrual Tension Syndrome Self-Rating Scale.
*$p < .001$ vs. controls, Mann-Whitney test.

If symptoms reported were obviously limited to the premenstruum and were not representative of the subject's usual personality, they were not included in the analysis. An informant for the IPDE was not used. Hill et al.[28] examined the factors that influence agreement between subject and informant in assessment of personality function. Contrary to what one might expect, there was no underreporting of difficulties by subjects, and there was also good agreement for levels of dysfunction.

Statistical Analysis

Parametric indices such as mean and standard deviation and t tests were used when appropriate. Nonparametric data obtained from the instruments used for diagnosis and ratings were analyzed using chi-square and Mann-Whitney tests. Tests were considered significant at $p < .05$.

RESULTS

Thirty-four women met criteria for PMDD without concurrent alternative Axis I disorder. They were compared with 22 healthy control women who had no severe premenstrual symptoms. Characteristics of these women are shown in Table 1. There was no significant difference in age between the 2 groups ($t = -0.75$, $p = .46$). Symptoms appeared to start at a relatively young age, with a mean recalled symptom duration of 11 years. There was a highly significant difference for both PMTS-O and PMTS-SR ratings between PMDD subjects and controls.

Rates of past Axis I disorder in the PMDD and control groups are shown in Table 2. Overall, there was significantly more psychiatric disorder in the PMDD group compared with the control group ($\chi^2 = 18.33$, df = 1, $p = .001$). As expected, the frequency of mood disorder history in the PMDD group was much higher than in the controls. There were significantly more past cases of major depression in the PMDD group ($\chi^2 = 14.66$, df = 1, $p = .001$). Puerperal mood disorders were considerably more frequent in the PMDD group: 10 of 15 parous women in the PMDD group versus none of 6 parous controls had suffered from postnatal depression ($\chi^2 = 7.7$, df = 1, $p = .01$).

Table 2. Past DSM-IV Axis I Diagnoses in the Premenstrual Dysphoric Disorder (PMDD) and Control Groups[a]

DSM-IV Diagnosis	PMDD (N = 34)	Control (N = 22)
Major depressive disorder (single episode)	18 (53)	3 (14)
Recurrent major depressive disorder	6 (18)	1 (5)
Depressive episode during the puerperium, N/N parous	10/15	0/6
Substance use disorder	2 (6)	0 (0)
Total with past Axis I disorder	26 (77)	4 (18)

[a]Values shown as N (%) unless specified otherwise.

Table 3. Dimensional Scores on the International Personality Disorders Examination for the Premenstrual Dysphoric Disorder (PMDD) (N = 34) and Control (N = 22) Groups

	PMDD Group		Control Group	
Personality Disorder Diagnosis	Mean	SD	Mean	SD
Paranoid	0.8	1.8	0.7	1.5
Schizoid	0.1	0.5	0.1	0.5
Dissocial	0.1	0.3	0.0	0.0
Emotionally unstable				
Impulsive	0.2	0.7	0.2	0.7
Borderline	1.3	2.6	0.5	0.8
Histrionic	0.2	0.7	0.0	0.0
Anancastic	4.2*	2.8	2.0	2.1
Anxious	1.0	1.7	0.5	0.8
Dependent	0.5	1.8	0.5	1.2

*p < .001, Mann-Whitney test.

Two women with PMDD had been dependent on opiates but had long been in remission.

For Axis II, both groups had low numbers of absolute personality disorder diagnoses, and no significant difference was found between groups. Eight subjects (24%) in the PMDD group in comparison with 1 (3%) in the control group had a personality disorder. This total was almost entirely represented by positive diagnoses of anancastic personality disorder. Six (18%) in the PMDD group had a pure diagnosis of anancastic personality disorder as compared with only 1 (5%) in the control group. One subject was found to have a diagnosis of dependent personality disorder. One subject had a combined diagnosis of paranoid personality disorder and borderline personality disorder while scoring highly on several dimensional scores.

Table 3 shows the dimensional scores for each disorder rating on the IPDE for the PMDD and control groups. The anancastic scores were significantly greater in the PMDD group than the control group, but no other differences met significance.

DISCUSSION

This investigation further confirms the link between affective illness and PMDD, notably puerperal mood disorder and major depressive disorder. Pearlstein et al.[17] commented on the high number of women in their study who had had a puerperal mood disorder, and this relationship is borne out in the current study in which two thirds of women with PMDD who were parous had had postnatal depression compared with none of the controls. Single-episode and recurrent major depressive disorder were highly represented in this sample of women with PMDD. One could propose that this co-occurrence represents a true relationship, since the diagnostic methods used sought to minimize methodological problems in diagnosis. The study also highlights why prospective follow-up may not be apt to reveal new cases of depression readily, since a large proportion of the results were already influenced by the high number of depression diagnoses at baseline.

PMDD symptoms were recalled over 11 years in this PMDD sample, and they may well have been present although not recalled prior to this study. It may be that a cohort of teenagers or college students, such as the young sample studied by Wetzel et al.,[13] needs to be followed up to observe the onset of diagnoses in order of occurrence, since premenstrual symptoms appear at a relatively young age and may or may not evolve into the full disorder.

The subject of Axis II disorders and their relationship to Axis I disorders is less clear. What is of note is the low occurrence of personality disorder diagnoses in both the subjects and controls and the lack of significant differences between groups. The failure to detect other significant differences may in part be due to the small number of study subjects with personality disorder diagnoses, as expected on the basis of previous estimates in the London population.[18] This finding does, however, concur with other studies that have not found high levels of personality disorder diagnosis associated with pure PMDD.[14,17,19] When personality disorder is present, multiple personality disorder diagnoses are likely in affected individuals.[29] One PMDD subject demonstrated this mixed pathology and appeared atypical to the PMDD group as a whole.

Anancastic traits were more highly represented in the PMDD group than the control group in this sample**.** The content of the dimension for assessing anancastic personality in the IPDE centers on perfectionism, rigidity, caution, and conventionality.[18] All of these items require convincing examples of the behavior in question and more than 4 of 8 criteria to be positive for a full personality disorder diagnosis**.** The IPDE has been found to be sound with respect to confining its scope to long-lasting personality traits that are relevant to personality disorder diagnosis.[30] Importantly for this study, obsessional symptoms that were purely cyclical and exclusive to the premenstruum without any generalization into more long-lasting elements of the personality were not included in the analysis.

The relationship of obsessional symptoms to PMDD, depression, and postnatal depression is certainly of interest. It is known that obsessional symptoms can occur dur-

ing the course of the affective disorders as epiphenomena[31] and may be more highly represented in postnatal depression than in nonpuerperal episodes. The content of obsessional thoughts in postnatal depression often centers on causing harm to the newborn.[32] Preexisting obsessional symptoms can increase in the premenstruum.[33] Compulsive hair-pulling also increased in the premenstruum in women suffering from trichotillomania.[34] Like PMDD, obsessive-compulsive disorder is hypothesized to be related to serotonergic systems, and some defects of serotonergic function in obsessive-compulsive disorder have been demonstrated in the laborotory.[35]

Underlying temperamental characteristics may ultimately underpin the relationship between obsessive traits, depression, and menstrual cycle mood change. Freeman et al.[36] found that the Harm Avoidance factor of the Tridimensional Personality Questionnaire (TPQ)[37] was associated with depressive symptoms in premenstrual syndrome. Benjamin et al.[38] have found that subjects with high persistence scores on the TPQ, characterized as perfectionist, industrious, and persistent, have polymorphism for the short serotonergic transporter allele. Not only, therefore, is the high prevalence of affective disorders supportive of the link between PMDD and serotonergic dysfunction, but the finding of obsessional character traits is also supportive of this relationship.

A criticism of the methodology used in this study is that even well-constructed methods of personality assessment using a categorical approach are conceptually difficult. Livesley[39] describes personality disorder as the least satisfactory of all contemporary psychiatric diagnoses since it is susceptible to value judgment, particularly because symptoms are inferred retrospectively over many years. The proposition that there is an underlying biological risk for PMDD, affective illness, and obsessionality could be further investigated by examination of temperamental rather than personality disorder factors in women with PMDD, with a subsequent examination of the common polymorphisms around the norepinephrine and serotonin systems.

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