

Premenstrual Complaints. I. Prevalence of Premenstrual Symptoms in a Swedish Urban Population

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Summary

The prevalence of premenstrual discomfort was studied in a random sample of 1083 Swedish women. Data were collected by questionnaire and assessments were made by the use of a quantitative scoring system. Mental symptoms in combination with feelings of body-swelling were common, noted in two-thirds (70%) of the women. The prevalence of certain target symptoms of premenstrual discomfort was studied. The mental symptoms were irritability, sadness and anxiety, and the physical symptoms were swelling in 3 areas of the body. Premenstrual anxiety was the only mental symptom shown to increase with age ($P < 0.01$). The severity of the complaints was neither affected by parity nor by abnormal cycle lengths. Absence from work during the premenstruum was reported by a small number of women and was related to the severity of the premenstrual discomfort.

Introduction

The premenstrual tension syndrome (PMT) or premenstrual syndrome (PMS) are terms previously used to designate a set of symptoms occurring during the latter half of the menstrual cycle and disappearing at the onset of menstrual flow. The inter-individual range of variation of the patterns and severity of the cyclic symptoms is wide. Common premenstrual symptoms are tension, irritability, anxiety, depression, insomnia, fatigue, headache, nausea and swelling of the breasts. Frank [1] in 1931 coined the expression PMT syndrome and emphasized the following major charac-

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teristics of the syndrome: irritability, depression and lethargy together with symptoms such as swelling of abdomen and breasts and oedema of the fingers and legs.

The prevalence of different premenstrual symptoms or combinations of symptoms ranges from 25% to almost 100%. Coppen and Kessel [2] concluded that around 25% of all women visiting general practitioner offices suffered from a PMT syndrome. Pennington [3], on the other hand, found that 95% of 1000 high school and college girls had some premenstrual symptoms. Bickers and Woods [4] found that 36% of 1500 female workers in a factory sought advice because of premenstrual complaints. The discrepancy between these findings may in part be ascribed to differences in sampling procedures. However, there is also an impression that the definition and grading of individual symptoms are often indistinct. The aim of the present study was to estimate the prevalence and severity of common and clearly defined premenstrual symptoms in a representative sample of the general population.

The possible correlation between these symptoms and abnormal menstrual cycle lengths (<25 days or >35 days) as well as the effect of age, parity and marital status was also considered of interest to elucidate.

Case material and Methods

Population sample

The material comprised 1083 women aged from 18 to 46 years and residing in the city of Göteborg. The female population in this age range was at the time of the last census (1978) about 102,000 women. Women of the age groups 18, 25, 32, 39 and 46 years were randomly selected from the district directory which gave not only the name and address but also marital status and occupation. The women were invited by letter to cooperate in the investigation by filling in and returning an enclosed questionnaire. If no reply was received additional letters were sent 2 and 4 weeks after the first inquiry. Fifty-one per cent of the sample responded to the questionnaire and an additional 12% after one reminder. The second reminder increased the total response frequency to 84.3%.

Analysis of non-respondents

The 170 non-respondents were compared with the 913 respondents. In the former group divorced or unmarried women and women of foreign extraction were significantly more common ($P < 0.01$). Age distribution was not significantly different in the two groups.

The questionnaire

In designing the questionnaire current literature was consulted for appropriate selection of items [5-7]. The most common mental symptoms appearing in these studies were selected, i.e., irritability, anxiety and depression of mood. Items concerning mental disturbances were formulated in accordance with corresponding items of the Comprehensive Psychiatric Rating Scale (CPRS) [8]. The self-rating method used in this investigation as compared to an interview method had been tested in a

pilot study. The results obtained indicated good correlation between the two methods [9]. Use of mild tranquilizers, need of medical attention and ability to work during the premenstrual period were also covered by the questionnaire. The women were asked to assess each symptom on a 4-point scale (Appendix I). Somatic symptoms such as swelling of abdomen, breasts, fingers and legs were also defined and rated on a 4-point scale (Appendix I). Information was obtained on marital status and parity.

Statistical methods

Significance tests for correlation were performed using Pitman's permutation test [10] which is a non-parametric test applicable to discrete as well as continuous distributions. Age and users/non-users of oral contraceptives (OC) were included as background variables when correlating subjective symptoms and findings in the questionnaire. For example, there is an obvious correlation between age and parity and one would also expect a correlation between age and premenstrual symptoms. Thus, a correlation between parity and premenstrual symptoms may be explained by age. In the same way the variable use/non-use of oral contraceptives is a background variable when the correlation between parity and premenstrual symptoms is studied. The background variables were taken into account by using the following non-parametric partial correlation test. The total series of 913 women was divided into 10 subgroups according to age and use/non-use of oral contraceptives. These groups were: women using oral contraceptives in age groups 18, 25, 32, 39 and 46 years and women not using oral contraceptives in age groups 18, 25, 32, 39 and 46 years. Within each subgroup Pitman's test variable was calculated. The results from the different groups were then pooled into a summarizing test concerning the partial correlation given the variables age and use/non-use of oral contraceptives [11]. The *P* values were determined by means of Edgeworth's expansion [12].

Results

Prevalence of individual symptoms

Table I gives the individual premenstrual symptoms and their severity in decreasing order of frequency. Irritability and swelling of the abdomen were clearly the most common symptoms with prevalence of around 70%. The frequency of the symptoms sadness, anxiety and swelling of the fingers and legs ranged from 25 to 35%. Swelling of the breasts was more commonly reported. The symptoms were generally described as mild to moderate and only rarely as severe.

Prevalence of combinations of symptoms ranked in order of occurrence

Premenstrual symptoms of some kind occurred among 92% of the women (Table II). The complaints often occurred in combinations, including both swelling and mental symptoms (69.5%). Complaints of all symptoms were noted by 9.2% of the women. Any swelling symptoms but no mental symptoms were reported by 13.4% and complaints of any mental symptoms but no swelling symptoms by 9.0%.

TABLE I

MAJOR PREMENSTRUAL SYMPTOMS RANKED IN ORDER OF PREVALENCE AND SEVERITY IN THE TOTAL POPULATION SAMPLE

	Prevalence (%) and severity of symptoms							
	Nil		Mild		Moderate		Severe	
	N	%	N	%	N	%	N	%
Irritability	215	25.2	352	41.2	264	30.9	23	2.7
Swelling of abdomen	221	26.0	368	43.3	244	28.7	17	2.0
Swelling of breasts	346	40.9	346	40.9	129	15.2	26	3.1
Sadness	527	65.0	215	26.5	57	7.0	12	1.5
Anxiety	550	65.9	227	27.2	30	3.6	27	3.2
Swelling of fingers and ankles	618	74.6	162	19.6	43	5.2	5	0.6

Intra-individual covariation of severity of premenstrual symptoms

The severity of mental symptoms was positively correlated to the severity of swelling symptoms (Fig. 1). Women with severe mental complaints generally reported moderate or severe swelling symptoms in 75% of the cases. The corresponding rate amongst women without mental complaints was 5%. Swelling symptoms were found to correlate positively to the degree of individual mental symptoms, irritability, sadness and anxiety ($P < 0.01$).

Length of menstrual cycle and severity of premenstrual symptoms

Non-users of oral contraceptives had regular periods in 78.4%, while 19.3% of the women had short (< 25 days) and 2.3% long menstrual cycles (> 35 days). It was found that abnormal menstrual cycle lengths did not correlate significantly with the severity of individual symptoms, except for swelling of fingers and legs. These latter symptoms were more common among women with abnormal cycle lengths ($P < 0.05$).

TABLE II

PREMENSTRUAL SYMPTOMS RANKED IN ORDER TO PREVALENCE IN THE TOTAL POPULATION SAMPLE

Mental and/or swelling symptoms indicate the existence of one or more symptoms.

	N	%
Any mental or swelling symptoms	721	91.9
Mental symptoms + swelling symptoms	545	69.5
Any swelling symptoms; no mental symptoms	105	13.4
Irritability + sadness + anxiety + swelling of the breasts + swelling of the abdomen + swelling of fingers and legs	72	9.2
Any mental symptoms; no swelling symptoms	71	9.1

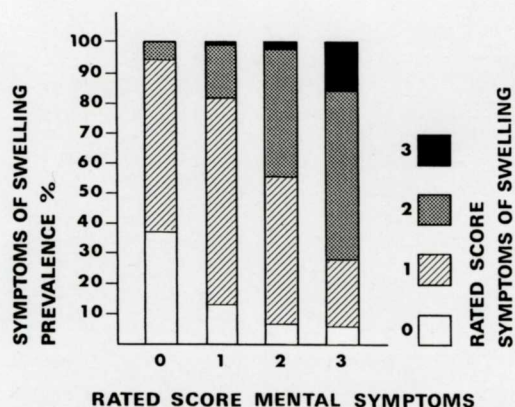


Fig. 1. Intercorrelation between premenstrual symptoms. Designation of swelling and mental symptoms: 1 = rated score 1-3; 2 = rated score 4-6; 3 = rated score 7-9 (Appendix I).

Age and prevalence of individual premenstrual symptoms

The prevalence of the most common individual premenstrual symptoms, irritability and swelling of abdomen, was not related to age. However, as presented in Fig. 2 and Table III the frequency and severity of anxiety and swelling of fingers and legs

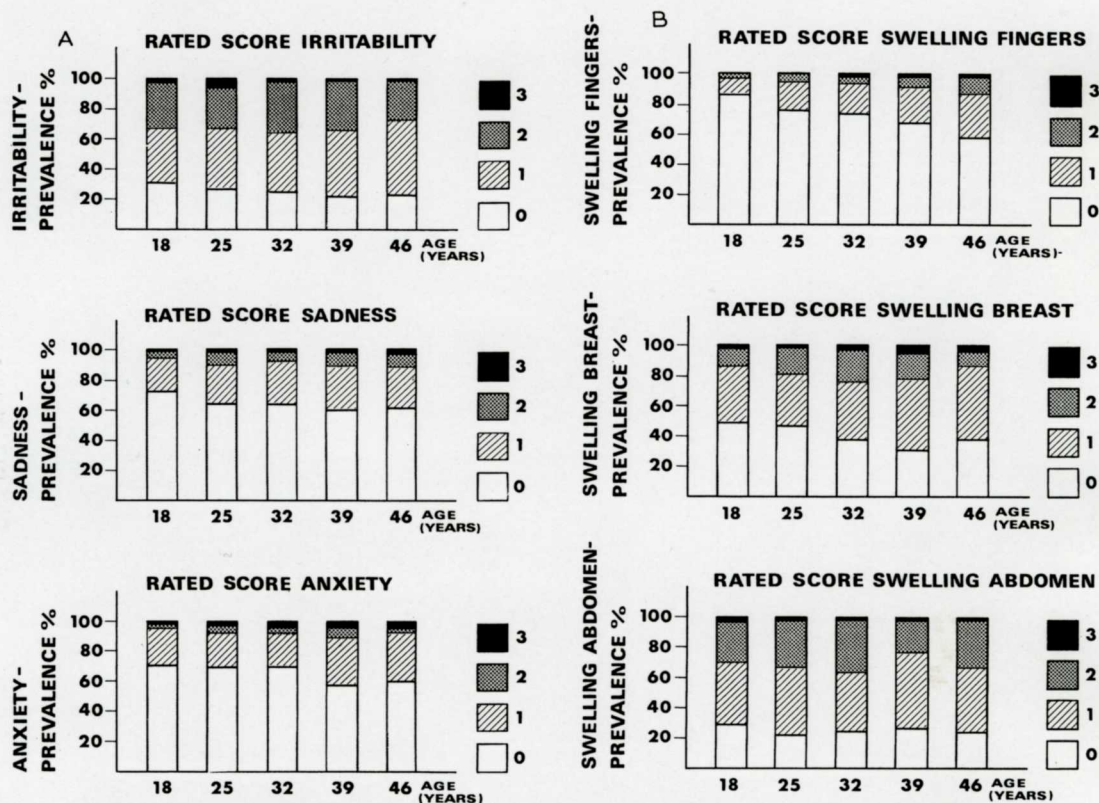


Fig. 2. Influence of age on the prevalence and intensity of premenstrual symptoms. Designation of individual symptoms according to Appendix I.

increased significantly with age ($P < 0.01$). Premenstrual symptoms are probably in some way linked with the functional performance of the hypothalamo-ovarian system. Irregularity of the menstrual cycle in young and premenopausal women is a well known phenomenon. Different age groups were therefore also tested against each other with regard to the occurrence of such symptoms (Table III). In the oldest age group (e.g., those of 39 and 46 years) sadness ($P < 0.01$), anxiety ($P < 0.01$), swelling of fingers and legs ($P < 0.01$) and swelling of the breasts ($P < 0.05$) were more common than in the youngest age group studied (e.g., those of 18 years). However, between the youngest age group and the intermediate age group (e.g., those of 25 and 32 years) there was no difference in frequency of individual symptoms except for swelling of fingers and legs ($P < 0.01$). Comparing the intermediate age group (25 and 32 years) with the oldest age group (39 and 46 years), anxiety ($P < 0.05$) and swelling of fingers and legs ($P < 0.01$) were more common in the latter groups.

Prevalence and severity of individual premenstrual symptoms

Distribution by marital status. Comparing married women with other women examined, no significant difference as to severity of the mental symptoms was found. Divorced women, however, showed a significantly higher severity of anxiety ($P < 0.05$) and swelling of the abdomen ($P < 0.05$) than women of other civil state.

Distribution by parity and foreign extraction. Among the 913 women studied no one had more than 6 children. When parity was analysed by Pitman's test [10] (see above), no significant correlation was found to severity of the symptoms assessed. By this procedure all females were included in the statistical analysis, irrespective of parity.

In our series 90 were born outside Sweden. Comparing those of foreign extraction with the rest, no significant difference appeared as to severity of the symptoms.

Ability to work. Ten per cent of the women ($N = 86$) were unable to work on one or several occasions during the premenstrual period in the preceding 6 months and 3.2% ($N = 28$) were absent from work on more than 2 occasions during the

TABLE III

SIGNIFICANCE OF CORRELATIONS (P VALUES)* BETWEEN AGE AND PREVALENCE OF DIFFERENT PREMENSTRUAL SYMPTOMS IN THE TOTAL POPULATION

	Age groups (years)			
	18 vs. 25 and 32	18 vs. 39 and 46	25 and 32 vs. 39 and 46	Total series
Irritability	n.s.	n.s.	n.s.	n.s.
Sadness	n.s.	0.01	n.s.	n.s.
Anxiety	n.s.	0.01	0.05	0.01
Swelling of fingers and legs	0.01	0.01	0.01	0.01
Swelling of breasts	n.s.	0.05	n.s.	n.s.
Swelling of abdomen	n.s.	n.s.	n.s.	n.s.

* Permutation test according to Pitman.

TABLE IV

INABILITY TO WORK DUE TO PREMENSTRUAL COMPLAINTS DURING THE 6 MONTHS PRECEDING THE INTERVIEW

Premenstrual absence from work	Frequency (%)	N
Never	90.1	780
Once	5.2	45
Twice	1.5	13
More than twice	3.2	28

same period (Table IV). Inability to work was found to be highly correlated to the severity of the individual premenstrual symptoms.

Use of tranquillizers and individual premenstrual symptoms

Mild tranquillizers were used more or less regularly by 7.4% ($N = 59$) of the women. The use of these drugs was significantly correlated to the severity of the individual premenstrual mental symptoms ($P < 0.01$) as well as to abdominal swelling ($P < 0.05$).

Need of medical attention

Fourteen per cent of the women ($N = 121$) reported that they wanted medication and 10.8% ($N = 39$) wanted to consult a physician because of their premenstrual symptoms. There was a positive correlation between the requirement for medical help and the severity of premenstrual symptoms ($P < 0.01$).

Discussion

The prevalence and pattern of premenstrual discomfort have been the subject of numerous investigations [1-7,13-15]. Yet, opinions still differ widely concerning definitions, symptomatology and prevalence. Most investigations [3,4,14-17] have been undertaken on selected groups such as school girls, factory workers, etc. The results of these studies are therefore not quite comparable. To our knowledge, however, the prevalence of various premenstrual complaints has never been studied in a random sample of the population.

The age groups comprised teenagers, adults and premenopausal women. Statistical methods made it possible to analyse how factors such as parity, civil state, etc. were correlated to premenstrual symptoms, using age as a background factor (see Statistical methods). Usage of OC may invalidate a proper evaluation of possible correlations. The variable users/non-users of OC was taken into account in the analysis of subjective symptoms related to findings.

For comprehensiveness we considered it necessary to include only selected mental items, even though several other items would have been of interest to study. The difference between premenstrual complaints and complaints during the menstruation

was stressed in the questionnaire. Furthermore, according to Moos [5] self-assessment of premenstrual tension complaints is not likely to be influenced by the phase of the menstrual cycle at the time of completion of the questionnaire. The series of women in our study consisted of females at all phases of the cycle.

Current literature [5,7,14–17] gives no precise definition of the premenstrual syndrome or the premenstrual tension state. If PMT is given a broad definition, thus including very mild symptoms, one would expect a high prevalence rate, perhaps approaching 100%.

From the clinical point of view a woman with only one minor symptom cannot be compared with women that suffer from both emotional disturbances and uncomfortable bloatedness. The prevalence of 92% (including any symptom), found in the present study, suggests that the condition is physiological rather than pathological. Most studies have not defined the degree of severity of the individual symptoms. However, a thorough analysis not only of the prevalence but also of the severity of individual premenstrual symptoms might facilitate the elucidation of the possible pathological significance of any symptom or combination of symptoms. In the present study each symptom was defined and operationally graded according to the CPRS inventory.

Irritability and swelling of the abdomen as defined were the most common symptoms with a prevalence of around 75%, rated from mild to severe. Symptoms were generally described as mild to moderate but rarely as severe. The average prevalence of severe individual premenstrual symptoms according to our definition was only 2–3%.

The rank of order of prevalence of the major premenstrual symptoms as found in the present study is similar to that identified by Sutherland and Stewart [15]. However, the frequency of the individual symptoms is somewhat different. Sutherland and Stewart [15] reported that 69% of the women suffered from irritability and 63% from depression. Our corresponding figures were 75 and 35%, respectively. This difference might be explained by the fact that most women in Sutherland's study were younger than 25 years of age. Coppen and Kessel [2] reported that 21% of the women complained of moderate irritability and 11% of severe irritability as compared to 31 and 2.8% in the present study. This discrepancy is most probably due to differences in defining the severity of symptoms. Comparison of this kind is obviously of less relevance.

The length of the menstrual cycle decreases with age [18]. This is probably due to shortening of the luteal phase. A positive correlation between PMT symptoms and a short luteal phase has been suggested [19]. In this study the prevalence and intensity of individual premenstrual symptoms did not vary significantly with the length of the menstrual cycle.

Neither were differences found in progesterone levels during the secretory phase or in menstrual cycle length between women with and without premenstrual complaints [20].

A number of authors [7,17] have emphasized that some women first experience premenstrual symptoms in their intermediate and late fertile life. In our study the prevalence and intensity of anxiety and swelling of fingers and legs increased signifi-

cantly with age. However, the prevalence of the most common individual premenstrual symptoms, i.e., irritability and swelling of the abdomen, was not found to be related to age. Comparing the different age groups we found that 18-year-old girls reported significantly less premenstrual complaints than the oldest age groups (39 and 46 years). No difference in premenstrual distress appeared between age groups 18 and 25 vs. 32, with the exception of swelling of fingers and legs. When comparing the intermediate age groups with the oldest age groups anxiety and swelling of fingers and legs were more common in the latter groups. Thus some but not all premenstrual complaints seemed to be more common in the oldest than in the youngest age groups. Women approaching their menopause may perhaps have more non-endocrinological causes of distress. It is possible that such conditions might influence premenstrual discomfort. It is notable though that one of the most frequent premenstrual symptoms, i.e., swelling of the abdomen, does not increase with age. Symptoms such as anxiety, possibly influenced by environmental factors, do increase in these age groups. However, the reason that older women have more premenstrual complaints than very young women may also be of hormonal origin; in the oldest group the level of FSH is generally elevated compared to the younger age groups [21].

Dalton [17] demonstrated a positive relationship between severity of premenstrual symptoms and parity. However, the age factor was not taken into account in Dalton's work [17]. In the present study no relationship between premenstrual complaints and parity was observed. Coppen and Kessel [2] confirmed this observation.

The prevalence and intensity of psychological changes 3–4 days or more before the start of the menstrual flow have been shown to be high. The conditions may be called a physiological state rather than pathological. The relatively small number of women seeking advice for the condition, in spite of evident mental stress, is probably due to the short duration of the premenstrual period. It seems also that most women accept the difficulties as a natural part of the menstrual cycle. At all events they do not often consult their physicians for premenstrual discomfort alone.

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Appendix I

Items for the rating^a of mental physical premenstrual tension symptoms.

Mental symptoms^b

Hostile feelings (irritability)

0 Not easily angered.

1 Easily angered. Reported hostile feelings, which are easily dissipated.

^a In text 0, 1, 2, 3 equal to nil, mild, moderate and severe respectively.

^b Mental symptoms as defined by The Comprehensive Psychopathological Rating Scale (CPRS).

- 2 Reacts to provocation with excessive anger or hostility.
- 3 Persistent anger, range of intense hatred which is difficult or impossible to control.

Sadness

- 0 Occasional sadness may occur in the circumstances.
- 1 Predominant feelings of sadness, but brighter moments occur.
- 2 Pervasive feelings of sadness or gloominess. The mood is hardly influenced by external circumstances.
- 3 Continuous experience of misery or extreme despondency.

Worrying over trifles (anxiety)

- 0 No particular worries.
- 1 Undue concern, worrying that can be shaken off.
- 2 Apprehensive and bothered about trifles or minor daily routines.
- 3 Unrelenting and often painful worrying. Reassurance is ineffective.

Physical symptoms (swelling)

Fingers — legs

- 0 No noticeable swelling.
- 1 Rings seem to fit more tightly than otherwise and shoes seem smaller.
- 2 Difficult to remove rings and they leave marks. Legs and feet swell.
- 3 Cannot wear rings. Pressure on the ankles leaves indentations.

Breasts

- 0 No swelling observed.
- 1 Brassière fits tighter than usual. Little or no tenderness.
- 2 Uncomfortable to wear brassière. Breasts rather tender.
- 3 Obvious swelling — brassière does not fit at all or cannot be worn owing to pain in the breasts.

Abdomen

- 0 No swelling observed.
- 1 Pants fit somewhat more tightly than usual. Little or no abdominal tension.
- 2 Pants definitely fit much more tightly than usual. Moderate abdominal tension and tenderness.
- 3 Impossible to wear pants owing to tenderness and abdominal tension.

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